Exhibit K

Land Use

Prepared for

Wheatridge Wind Energy, LLC

Wheatridge Wind Energy Facility
July 2015

Prepared by

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Terms and Definitions

Collector Line	An underground or overhead electrical 34.5 kV line transmitting power from the turbines to a Substation
Construction Yard	The temporary area for construction activities and Project component storage prior to installation
GE 1.7-103 Layout	Project turbine layout comprised of 292 GE 1.7MW turbines with 80m hub heights and 103m rotor diameters
GE 2.5-120 Layout	Project turbine layout comprised of 200 GE 2.5MW turbines with 85m hub heights and 120m rotor diameters
Gen-tie Line(s)	One or two 230 kV transmission line(s) conveying power from the Project to an interconnection point with the grid, which will be permitted and built by UEC or UEC/CB
Intraconnection Corridor	The intraconnection transmission line corridor connecting Wheatridge East with Wheatridge West
Intraconnection Line(s)	One or two overhead electrical 230 kV lines connecting the Project Substations in Wheatridge East and Wheatridge West.
Met Tower	Permanent meteorological tower
O&M Buildings	Permanent operations and maintenance buildings, including parking
Project	Wheatridge Wind Energy Facility
Site Access Road	Private road to be constructed or improved for the purpose of accessing turbines and associated Project facilities
Site Boundary	The boundary within which all Project facilities will be constructed, also known as the micrositing corridor
Substation	A facility in which electric power from the turbines is aggregated, stepped up in voltage, and connected to the Intraconnection Line(s) or the Gen-tie Line(s)
Turbine	A collective term for the foundation, tower, nacelle, blades and rotor that comprise a wind turbine generator in the Project
Turbine Pad	A cleared, graveled area around the base of each turbine encompassing primarily the turbine's foundation
Wheatridge	Wheatridge Wind Energy, LLC
Wheatridge East	The eastern group of turbines
Wheatridge West	The western group of turbines

Acronyms and Abbreviations

CB	Columbia Basin Electric Cooperative
CTUIR	Confederated Tribes of the Umatilla Indian Reservations
EFSC	Energy Facility Siting Council
EFU	Exclusive Farm Use
ESCP	Erosion and Sediment Control Plan
kV	kilovolts
LCDC	Land Conservation and Development Commission
MCCP	Morrow County Comprehensive Plan
MCZO	Morrow County Zoning Ordinance
MW	megawatts
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
OAR	Oregon Administrative Rule
ODEQ	Oregon Department of Environmental Quality
ODFW	Oregon Department of Fish and Wildlife
OR-##	Oregon State Highway ##
ORS	Oregon Revised Statutes
UCCP	Umatilla County Comprehensive Plan
UCDO	Umatilla County Development Ordinance
UEC	Umatilla Electric Cooperative

1.0 Introduction

Wheatridge Wind Energy, LLC (Wheatridge), proposes to construct the Wheatridge Wind Energy Facility (Project), a wind generation facility with a maximum nominal generating capacity of 500 megawatts (MW) in Morrow and Umatilla counties, Oregon (see Figures C-1 and C-2). The Project is comprised of up to 292 turbines divided into two groups: a western group of turbines (Wheatridge West) and an eastern group of turbines (Wheatridge East). Wheatridge West and Wheatridge East are electrically connected by an 'Intraconnection Corridor' containing up to two parallel overhead 230-kilovolt (kV) transmission lines (Intraconnection Lines), each no longer than 35 miles in length. Other Project components include access roads (Site Access Roads), an electrical collection and control system, the Project's substations (Substations), operations and maintenance buildings (O&M Buildings), and temporary construction yards (Construction Yards). These facilities are described in greater detail in Exhibit B.

Wheatridge West is located entirely within Morrow County, approximately 5 miles northeast of Lexington, and approximately 7 miles northwest of Heppner. Wheatridge West is bisected by Oregon Highway 207 (OR-207). Wheatridge East is located approximately 16 miles northeast of Heppner and encompasses land in both Morrow and Umatilla counties. The Intraconnection Corridor is located primarily within Morrow County and adjoins to the southeastern portion of Wheatridge West and the southern portion of Wheatridge East.

This exhibit demonstrates that the Wheatridge Wind Energy Project (Project) complies with Energy Facility Siting Council's (EFSC) land use standard, which provides:

> ***OAR 345-022-0030, Land Use***
>
> *(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.*

Wheatridge has elected to address EFSC's land use standard by obtaining a land use determination from EFSC pursuant to Oregon Revised Statutes (ORS) 469.504(1)(b). EFSC's rules state that an applicant seeking EFSC's land use approval must identify the "applicable substantive [land use] criteria" of the relevant local governments and must describe how the proposed facility complies with those criteria, as well as any Land Conservation and Development Commission (LCDC) rules, goals, or land use statutes that apply directly to the facility under ORS 197.646(3). If an applicant cannot demonstrate compliance with one or more of the applicable substantive criteria, the applicant must describe how the proposed facility complies with the Statewide Planning Goals adopted by the LCDC, or alternatively, warrants a goal exception (OAR 345-021-0010(1)(k)).

This exhibit demonstrates that the Project complies with the majority of the applicable local substantive criteria from the comprehensive plans and zoning codes for the jurisdictions in which the Project is located, and to the extent the Project cannot comply with an applicable criterion, EFSC should approve a variance to the applicable criterion or a goal exception.

Pursuant to the Project Order, the analysis area for purposes of this exhibit is "the area within the Site Boundary and one-half mile from the Site Boundary." Figure K-1 shows both the Site Boundary and the analysis area for this Exhibit. The alternative Project layouts for the GE 1.7-103 and 2.5-120 turbines are shown in Figures K-3 and K-4, respectively.

2.0 Compliance with Applicable Substantive Criteria

The Project and all related and supporting facilities will be located entirely within the Exclusive Farm Use (EFU) zones of both Morrow and Umatilla counties (Figure K-2). Both counties replied to the Project Notice of Intent (NOI) by identifying applicable substantive criteria from their respective codes, ordinances, plans and other authorities. The following section provides an assessment of compliance with the applicable local substantive criteria identified by the counties.

2.1 Applicable Criteria for Morrow County

This section demonstrates how the portion of the Project located in Morrow County satisfies the Morrow County applicable substantive criteria. In its April 12, 2013 response to the NOI, Morrow County identified the following applicable substantive criteria:

- Morrow County Comprehensive Plan (MCCP), Agricultural Policy 1 and Energy Policies 2 and 3;
- Fish and Wildlife Habitat Protection Plan for Morrow County dated January 1979;
- Morrow County Zoning Ordinance (MCZO), Sections 3.010, subsections A, C, D, D[1] and G, 4.165, 6.015, 6.020, 6.030, and 6.050;
- Morrow County Solid Waste Ordinance, Section 5.000; and
- Morrow County Weed Control Ordinance MC-C-3-90, as amended by Ordinance MC-C-2-99.

These substantive criteria are discussed in Sections 2.1.1 through 2.5.5 below.

2.1.1 MCCP Policies

Agricultural Policy 1: It shall be the policy of Morrow County, Oregon, to preserve agricultural lands, to protect agriculture as its main economic enterprise, to balance economic and environmental considerations, to limit non-compatible nonagricultural development, and to maintain a high level of livability in the County.

> Response: Wind energy facilities are not inconsistent with an agriculturally-focused economy and land base, as evidenced by the multitude of existing wind projects in productive agricultural areas of Morrow County and elsewhere in the state and region. The Project will provide an economic benefit to Morrow County, will not degrade the environment and will provide positive environmental effects by reducing greenhouse gases

[1] MCZO Section 3.010 has two subsections identified as "D."

and combating climate change. Wind projects have not been shown to have any significant deleterious effect on livability, in Morrow County or other rural areas. Wind projects are expressly permitted in the Morrow County EFU zone. Agricultural Policy 1 is met.

Energy Policy 2: [It shall be the policy of Morrow County, Oregon,] to conserve energy and develop and use renewable resources.

Response: The Project is a wind energy facility, a renewable resource that furthers Energy Policy 2.

Energy Policy 3: [It shall be the policy of Morrow County, Oregon,] to encourage development of solar and wind resources.

Response: The Project is a wind energy facility in furtherance of Energy Policy 3.

2.1.2 Fish and Wildlife Habitat Protection Plan for Morrow County

Morrow County's letter identified as substantive criteria the Fish and Wildlife Habitat Protection Plan for Morrow County dated January 1979 (Protection Plan).

Response: The Project would have no significant impacts to the areas in Morrow County identified in the Protection Plan as sensitive habitat for fish or wildlife. Areas designated in the Protection Plan as sensitive big game habitat are located more than 10 miles to the south of the Site Boundary. Sensitive waterfowl habitat is limited to areas around the Columbia River and the Umatilla National Wildlife Refuge, which are more than 15 miles north of the Site Boundary. Sensitive nongame habitat is limited to the area within the Boardman Bombing Range. The Project would avoid all impacts to waters and potential sensitive fish habitat. Sensitive habitat for upland game birds and furbearers consists primarily of riparian habitat areas and three established wildlife management areas, none of which would be directly impacted by the Project. Potential Project effects to riparian areas would be limited to overhead transmission line(s) crossing the areas, with no direct disturbance to riparian vegetation. As discussed in Exhibit P, potential impacts to these areas have been previously discussed with the Oregon Department of Fish and Wildlife (ODFW) and were determined to be insignificant. The Project is a widely spaced series of turbines with minimal supporting infrastructure, much of which is located underground; as such it will not interfere with game movement or habitat. Further analysis of fish and wildlife impacts and mitigation is found in Exhibits P and Q.

2.1.3 MCZO Criteria

Morrow County's letter in response to the NOI identified the following provisions of the MCZO as applicable to the Project:

SECTION 3.010. EXCLUSIVE FARM USE, EFU ZONE.

In an EFU Zone, the following regulations shall apply:

A. PURPOSE: The purpose of the Exclusive Farm Use Zone is to preserve and maintain agricultural lands for farm use consistent with historical, existing, and future needs, including economic needs that pertain to the production of agricultural products, and to permit the establishment of only those uses that are compatible with agricultural activities.

Uses, buildings, or structures hereafter erected, structurally altered, enlarged, or moved and land hereafter used in the Exclusive Farm Use Zone shall comply with the following regulations.

> Response: The uses proposed in connection with the Project all are permissible uses within the Morrow County EFU zone, either outright or as conditional uses. Consequently, all proposed uses are consistent with the purpose of the County's EFU zone.

C. USES PERMITTED OUTRIGHT.

In an EFU Zone the following uses and accessory uses thereof are permitted outright:

16. Utility and transmission towers not exceeding 200 feet in height.

> Response: The towers for the above-ground electrical Collector Lines (should any above-ground segments be necessary), and for the Intraconnection Line(s) between Wheatridge East and Wheatridge West, would all be less than 200 feet in height. Thus, such uses are permitted outright.

D. CONDITIONAL USES PERMITTED. In an EFU Zone, the following uses and their accessory uses are permitted subject to demonstration of compliance with the requirements of Article 6 of this ordinance and Section (G) below:

16. Commercial utility facilities for the purposes of generating power for public use by sale. A power generation facility shall not preclude more than 12 acres of high value farmland or 20 acres of other land from commercial farm use unless an exception is approved pursuant to OAR 660 Division 4.

> Response: The Project is commercial utility facility for the purpose of generating power for public use by sale. As shown in Table K-1, the Project would permanently preclude agricultural use of approximately 0.01 acres of high-value farmland and up to 146.26 acres of other farmed land in Morrow County. Consequently, MCZO 3.010.D.16 is not met, but the Applicant demonstrates below in Section 5 that a Goal 3 exception should be taken under ORS 469.504(2).
>
> The lands devoted to farm use in Morrow County are used primarily for cultivation of wheat and grazing of livestock, and related accessory uses. Figures K-5 and K-6 show the areas dedicated to farm use, as well as the areas defined by the MCZO as High Value Farmlands.

Table K-1. Impacts to Farmland in Morrow County		
Total Area Within Site Boundary in Morrow County	11,395 acres	
Area Within Site Boundary in Morrow County Devoted to Farm Use[1/]	10,815 acres total, of which 85.78 acres are High Value Farmland[2/]	
Acres Permanently Impacted by Project	**Not High Value Farmland**	**High Value Farmland[2/]**
Wheatridge West		
GE 1.7-103 layout	128.83	0
GE 2.5-120 layout	108.56	0
Wheatridge East		
GE 1.7-103 layout	17.18	0
GE 2.5-120 layout	14.65	0
Intraconnection Lines		
Option 1 (Longest)	0.85	0.01
Option 3 (Shortest)	0.65	0.01
SUBTOTALS (worst-case scenario)[3/]	146.26 acres	0.01 acres
TOTAL (worst-case scenario)	**146.27 acres**	

1/ Consistent with the definition of "farm use" in ORS 215.203 and OAR 660-033-0020(7), all land shown on Figures K-5 and K-6 as Developed-Dryland Wheat, Developed-Irrigated Agriculture, Developed-Revegetated or Other Planted Grassland, Grassland-Exotic Annual and Grassland-Native Perennial has been included in the calculation of land devoted to farm use for this Exhibit.

2/ Pursuant to MCZO 3.010.D.16, this calculation applies the definition of "high-value farmland" from OAR 660-033-0020(8)(a) for lands in Eastern Oregon: land with soils that are irrigated or not irrigated, and classified as prime, unique, Class I or Class II by the USDA National Resource Conservation Service (NRCS).

3/ The worst-case scenario is the GE 1.7-103 layout with the longest Intraconnection Line.

17. Utility facilities "necessary" for public service, excluding commercial utility facilities for the purpose of generating power for public use by sale, and transmission towers over 200 feet in height. A utility facility is necessary for public service if the facility must be sited in an exclusive farm use zone in order to provide the service. To demonstrate that a utility facility is necessary, an applicant must show that reasonable alternatives have been considered and that the facility must be sited in an exclusive farm use zone due to one or more of the factors listed in OAR 660-033-0130(16).

Response: This Section implements ORS 215.275, which applies only to utility facilities necessary for public service. The Project is a commercial facility for the purpose of generating electrical power for public use by sale, and therefore is excluded from the definition of a utility facility necessary for public service. ORS 215.283(1)(c). Per discussion with Morrow County Planning Director Carla McLane on April 22, 2014, this criterion was included in the County's response to the NOI because of uncertainty at the time as to whether the transmission line (Gen-tie Line(s)) delivering energy from the Project Substations to the point of interconnection (POI) would obtain land use approval as part of the Project. It has since been determined that the Gen-tie Line(s) will be separately

permitted, constructed and owned by Umatilla Electric Cooperative (UEC) or UEC/ Columbia Basin Electric Cooperative (CB). Accordingly, MCZO 3.010(D)(17) does not apply to this proposal.

D. LIMITATIONS ON CONDITIONAL USES. In addition to the general standards and conditions that may be attached to the approval of a conditional use as provided by Article 6 of this ordinance, the following limitations shall apply to a Conditional Use in the EFU Zone.

1. Will not force a significant change in accepted farm or forest practices on surrounding lands devoted to farm or forest use; and

2. Will not significantly increase the cost of accepted farm or forest practices on lands devoted to farm or forest use.

Response: There is no forest use within the analysis area. As shown in Table K-1, within the Site Boundary approximately 10,815 acres in Morrow County are "devoted to farm use." Once built, permanent Project facilities would occupy (at most) approximately 146.27 acres, or about 1.4% of the agricultural lands within the Site Boundary.

The lands devoted to farm use in Morrow County are used primarily for cultivation of wheat and grazing of livestock, and related accessory uses.

The impact of the Project would not force a significant change in accepted farm practices or significantly increase the cost of farm practices, for the reasons discussed below:

- Facility components and temporary construction laydown and staging areas would be sited to minimize disturbance to farming operations.
- Land permanently lost to farm use due to siting of permanent Project improvements is a de minimis percentage of the total farm use land in Morrow County; therefore the inability to use the land for farm purposes is not significant.
- Project Site Access Roads and other facilities would be constructed and maintained by Wheatridge, such that the cost burden for maintenance does not fall upon the farm or ranch owners.
- Private access roads improved or developed for the Project would benefit agricultural users of the land through improved access to farm fields and resulting lower fuel costs.
- Wheatridge will implement a weed control plan consistent with the Morrow County Weed Control Ordinance, which will reduce the risk of weed infestation in cultivated land and the associated cost to the farmer for weed control.
- Wheatridge will record a covenant not to sue against its Project leasehold interests with regard to generally accepted farming practices on adjacent farmland.
- Construction and operation of the Project could cause changes in routes of access to fields and changes in the pattern of cultivation, seeding, fertilizing and harvesting

near the turbines and Site Access Roads. To minimize this, Wheatridge, in consultation with the landowners, has laid out the facility components to minimize obstacles to farming in cultivated fields (facility components around which the farmer would have to plow, plant and harvest).

- Wheatridge will consult with area landowners during construction and operation of the facility to determine further measures to reduce or avoid any adverse impacts to farm practices on surrounding lands and to avoid any increase in farming costs.
- Construction of the Project could adversely affect soil quality by erosion or compaction. Some farmland would be temporarily disturbed and unavailable for farming during construction. To avoid or reduce adverse impacts to soil quality, Wheatridge will implement dust control and erosion-control measures during construction and operation of the facility (see Exhibit I). To the extent practicable, Wheatridge proposes to reduce impact to soils by using areas that are already disturbed and limiting the area of new disturbance.
- Construction vehicles will use previously disturbed areas including existing roadways and tracks. When practical, temporary Construction Yards and laydown areas will be located within the future footprint of permanent structures. The width of new permanent roadways will be the minimum consistent with safe use. Underground communication and electrical lines will be buried within the area disturbed by temporary road widening to the extent practicable, and turbine foundations will abut roadways as closely as possible. Upon completion of construction, Wheatridge will restore temporarily disturbed areas to their pre-construction condition.

G. DIMENSIONAL STANDARDS. In any EFU zone, the following dimensional standards shall apply:
(Standards 1 through 6 omitted for brevity)

Response: This Section pertains to the size of parcels and the siting of dwellings. The Project does not involve subdivision of parcels or the development of dwellings. MCZO 3.010(G) contains no applicable substantive criteria for the Project.

SECTION 4.165 SITE PLAN REVIEW

Site Plan Review is a non-discretionary or "ministerial" review conducted without a public hearing by the County Planning Director or designee. Site Plan Review is for less complex developments and land uses that do not require site development or conditional use review and approval through a public hearing.

A. Purpose. The purpose of Site Plan Review (ministerial review) is based on clear and objective standards and ensures compliance with the basic development standards of the land use district, such as building setbacks, lot coverage, maximum building height, and similar provisions. Site Plan review also addresses conformity to floodplain regulations, consistency with the Transportation System Plan, and other standards identified below.

C. Applicability. Site Plan Review shall be required for all land use actions requiring a Zoning Permit as defined in Section 1.050 of this Ordinance. The approval shall lapse, and a new application shall be required, if a building permit has not been issued within one year of Site Review approval, or if development of the site is in violation of the approved plan or other applicable codes.

Response: MCZO 1.050 defines "Zoning Permit" as "an authorization issued prior to a building permit, or commencement of a use subject to administrative review, stating that the proposed use is in accordance with the requirements of the corresponding land use zone." Upon issuance of an EFSC Site Certificate, Morrow County shall issue a Zoning Permit pursuant to ORS 469.401(3). The Applicant acknowledges that Site Plan Review will be required prior to issuance of building permits for the Project in Morrow County, and will demonstrate compliance with the development standards of the EFSC Site Certificate at that time. Wheatridge anticipates that Site Plan Review would be accomplished in stages commensurate with phasing of Project construction.

D. Review Criteria.

1. The lot area shall be adequate to meet the needs of the establishment.

Response: The Site Boundary encompasses about 11,395 acres in Morrow County, with the individual turbines and other project components sited according to prevailing standards in the wind energy industry. The land leased for the Project in Morrow County provides adequate space to site the Project as designed.

2. The proposed land use is permitted by the underlying land use district.

Response: The uses proposed in connection with the Project all are permissible uses within the Morrow County EFU zone, either outright or as conditional uses.

3. The land use, building/yard setback, lot area, lot dimension, density, lot coverage, building height and other applicable standards of the underlying land use district and any sub-district(s) are met.

Response: The land use standards of the EFU zone are met, as explained throughout this Exhibit. Any O&M Buildings and/or Substations in Morrow County will be sited to comply with all applicable development standards. The only other objective development standard in the Morrow County EFU zone that is applicable to the Project is MCZO 3.010.H.4 requiring septic installations be set back at least 100 feet from any lake or stream. This standard will be met with respect to the septic installation for the O&M Buildings.

4. Development in flood plains shall comply with Section 3.100 Flood Hazard Overlay Zone of the Ordinance.

Response: MCZO Section 3.100 applies to the development of "structures" in flood hazard areas. A "structure" is defined as "a walled and roofed building including a gas or liquid storage tank that is principally above ground." The Project does not involve the construction of any "structures" in flood hazard areas of Morrow County. Accordingly, the regulations of MCZO Section 3.100 are not implicated by the Project.

To the extent any improvements that are not "structures" are constructed in flood hazard areas, those improvements are either: (a) located underground and not susceptible to flood damage, or (b) consist of transmission lines high above the ground and with sufficient foundations or pole bedding to withstand even the most severe flood. Also, these types of improvements would not substantively alter the flood regime or flood water storage volume, and therefore would not exacerbate a flood hazard locally or elsewhere along a stream. The design of the Project is therefore consistent with the intent of MCZO Section 3.100.

5. Development in hazard areas identified in the Morrow County Comprehensive Plan shall safely accommodate and not exacerbate the hazard and shall not create new hazards.

Response: The MCCP, Natural Hazards Element, identifies hazard areas as "areas that are subject to natural events that are known to result in death or endanger the works of man, such as stream flooding, ocean flooding, ground water, erosion and deposition, landslides, earthquakes, weak foundation soils and other hazards" unique to the area in question. MCCP Natural Hazards Policy #8 places the burden on the project applicant to identify the existence and degree of natural hazards.

Flood hazards are discussed above in response to MCZO Section 4.165.D.4. Other potential geologic hazards as listed in the Natural Hazards Element are discussed in Exhibit H, which demonstrates that the Project will accommodate and not exacerbate existing hazards, nor create new ones.

6. Off-street parking and loading-unloading facilities shall be provided as required in Section 4.040 and 4.050 of the Morrow County Zoning Ordinance. Safe and convenient pedestrian access to off-street parking areas also shall be provided as applicable.

Response: Adequate off-street parking will be provided at the O&M Buildings and at Project Substations as required. No Project vehicles will be permitted to park within a public right-of-way.

7. County transportation facilities shall be located, designed and constructed in accordance with the design and access standards in the Morrow County Transportation System Plan.

Response: Improvements to public roads, whether necessary at the site access points or elsewhere on public roads to permit passage of construction or maintenance equipment and materials, will be designed and constructed in accordance with Morrow County standards.

8. Site planning, including the siting of structures, roadways and utility easements, shall provide, wherever practicable, for the protection of trees eight inch caliper or greater measured four feet from ground level, with the exception of noxious or invasive species, such as Russian olive trees.

Response: Wheatridge does not anticipate that development of the Project would cause impacts to any trees.

9. Development shall comply with Section 3.200 Significant Resources Overlay Zone or 3.300 Historic Buildings and Sites protecting inventoried significant natural and historic resources.

Response: Morrow County updated the Natural Resources Element of the MCCP on October 1, 2013. The updated Natural Resources Element calls for an ongoing four-step process to identify the following significant natural resources in the County: wetlands, wildlife habitat, groundwater resources, natural areas, historic resources, open space and scenic views and sites. The Project is in compliance with MCZO 3.200 and 3.300 regarding these significant resources as follows:

- The Project has been designed to avoid all impacts to wetlands, as discussed in Exhibit J.
- As discussed above in Section 2.1.2 and in Exhibits P and Q, the Project has been sited and designed to minimize impacts to wildlife habitat.
- The Project will have no material impact on groundwater resources due to its minimal operational water demand. Water for construction will be obtained from permitted municipal sources and will not exceed the combined available water rights for those sources.
- There are no designated natural areas or public open space, and the County has no protected scenic views or sites, within the analysis area.
- The Project would not impact any structure listed in the MCCP inventory of significant historical resources, as no such listed resources exist in the analysis area. Nonetheless, Wheatridge will protect all cultural and historic resources in Morrow County eligible or potentially eligible for regulatory protection consistent with the recommendations of the Confederated Tribes of the Umatilla Indian Reservations (CTUIR).
- The Project is located entirely on private land, none of which is designated as open space, and actually impacts only a very small percentage of the Project site. The Project will not significantly impact the existing open space character of the Project lands.

The impacts of the Project on scenic, protected, historic and recreational areas are also discussed in further detail in Exhibits R, L, S and T respectively.

10. The applicant shall determine if compliance is required with Oregon Water Resources Department water quantity and/or Oregon Department of Environmental Quality water quality designations.

Response: Water quantity issues are discussed in Exhibit O, and water quality issues are discussed in Exhibits I and O. As to water quantity, the Project will obtain water from existing municipal water providers not in excess of their service capacity and available water rights. As to water quality, the Project will obtain a National Pollutant Discharge Elimination System (NPDES) discharge permit and will implement all required best

management practices to preserve water quality. The Project will obtain appropriate permits from the Army Corps of Engineers to the extent required under the federal Clean Water Act. The Oregon Department of Environmental Quality (ODEQ) has previously confirmed that the Project will not have adverse impacts on any existing wells within the Site Boundary (personal communication between Robert Friedel, Tetra Tech and Krista Ratliff, ODEQ, November 27, 2013).

11. The applicant shall determine if previous Code Enforcement violations have been cleared as applicable.

Response: This is a new project and, as such, has no history of code enforcement in Morrow County.

12. The applicant shall determine the method of disposal for solid waste, with staff providing information to the applicant about recycling opportunities.

Response: Solid waste management and disposal are discussed in Exhibit V of this application. Wastes will be collected at each construction site and then consolidated at the construction laydown area for removal by a qualified third party for disposal at the Finley Butte landfill. Wastes will be recycled to the extent practicable.

13. The applicant shall obtain the necessary access permit through the Public Works Department as required by Morrow County Resolution R-29-2000.

Response: Prior to beginning construction of the Project, Wheatridge will obtain appropriate permits to allow access into the Project site from public rights-of-way.

E. Submittal Requirements. A site plan shall be submitted including all of the following information except for specific items determined at the pre-application review not to be applicable. All site plans shall have dimensions clearly indicated. An applicant may provide the information on separate sheets, if necessary or desirable for clarity.

(Submittal Requirements 1 through 10 omitted for brevity)

Response: Wheatridge will submit site plans with the required information at the time of Site Plan Review.

ARTICLE 6. CONDITIONAL USES

SECTION 6.015. REQUIREMENTS UNDER A STATE ENERGY FACILITY SITE CERTIFICATE.

If a holder of a Site Certificate issued by the Oregon Energy Facility Siting Council requests a conditional use permit for an energy facility as outlined under ORS 469.401(3) and pays the requisite fee, the Planning Director shall issue such conditional use permit. The conditional use permit shall incorporate only the standards and conditions in Morrow County's land use and other ordinances as contained in the site certificate. Issuance of the Conditional Use Permit shall be done promptly, not taking more than four weeks once it has been determined that a valid Site Certificate has been issued, the applicant has submitted a complete application and the fee has been received.

Response: Wheatridge will request issuance of a conditional use permit pursuant to Section 6.015 upon issuance of the requested EFSC Site Certificate.

SECTION 6.020. GENERAL CRITERIA.

In judging whether or not a conditional use proposal shall be approved or denied, the Commission shall weigh the proposal's appropriateness and desirability, or the public convenience or necessity to be served against any adverse conditions that would result from authorizing the particular development at the location proposed and, to approve such use, shall find that the following criteria are either met or can be met by observance of conditions.

A. The proposal will be consistent with the Comprehensive Plan and the objectives of the Zoning Ordinance and other applicable policies and regulations of the County.

Response: Issuance of an EFSC Site Certificate is dependent on a finding by the Council that the substantive criteria identified by the County as relevant to the proposed project, and addressed in this Exhibit, have been satisfied or otherwise resolved. Accordingly, this criterion is met upon a determination that all the Morrow County substantive criteria have been satisfactorily addressed.

B. If located within the Urban Growth Boundary of a city, that said city has had an opportunity to review and comment on the subject proposal.

Response: The Project is not located within any Urban Growth Boundary, so this criterion does not apply.

C. The proposal will not exceed carrying capacities of natural resources or public facilities.

Response: As described in Exhibit U of this application, the Project would not adversely affect any public facilities, and as described in Exhibits I, J, O, P and Q, the Project would not cause significant adverse effects to soils, surface or groundwater resources, or protected plant or animal species or their habitats.

SECTION 6.030. GENERAL CONDITIONS.

In addition to the standards and conditions set forth in a specific zone, this article, and other applicable regulations; in permitting a new conditional use or the alteration of an existing conditional use, the Commission may impose conditions which it finds necessary to avoid a detrimental impact and to otherwise protect the best interests of the surrounding area or the County as a whole. These conditions may include the following:

Response: The County may not impose conditions on a conditional use permit issued in furtherance of an approved EFSC Site Certificate. ORS 469.401(3). The following discussion demonstrates how the Project would satisfy the conditions that would typically be applied to a conditional use under MCDO 6.030.

A. Limiting the manner in which the use is conducted including restricting the time an activity may take place and restraints to minimize such environmental effects as noise, vibration, air pollution, glare and odor.

Response: The Project has been designed to minimize environmental effects. The Project will not cause air pollution or odors, and does not include equipment that would cause vibration. The Project is designed to comply with state noise standards, as described in Exhibit X of this application. The Project would have minimal outdoor lighting, at the O&M building and substation. Where outdoor lighting is necessary it will be shielded and aimed downward and inward to prevent offsite glare. Additionally, all outdoor lighting will use motion sensors and/or timers to ensure that lights are only on when needed. Red flashing lights must be installed atop select turbines per FAA marking requirements, but no other turbine lighting will be used.

B. Establishing a special yard or other open space or lot area or dimension.

Response: The Project incorporates several special setbacks for the wind turbines to avoid impacts to public roads and adjacent non-participating properties, and will adhere to existing County setback requirements for the O&M facility and substations. The Project does not involve the subdivision of land so lot area and dimensional standards are not applicable. The Project is located entirely on private land, none of which has been designated as open space; open space set-asides are inappropriate in this case.

C. Limiting the height, size or location of a building or other structure.

Response: Height, size and location limits for the wind turbines are established through the EFSC process as opposed to being established by the County. The O&M building and substations will be located and designed to comply with standard County height and setback limits.

D. Designating the size, number, location and nature of vehicle access points.

1. *Where access to a county road is needed, a permit from Morrow County Public Works department is required. Where access to a state highway is needed, a permit from ODOT is required.*

   Response: The Project will require the development or improvement of access roads intersecting with county roads and state highways. The Applicant will work with the Morrow County Road Department to permit specific access locations and improvement requirements, as necessary, prior to making improvements at each county road access point. Similarly, the Applicant will work with ODOT for access roads that would intersect with a state highway.

2. *In addition to the other standards and conditions set forth in this section, a Traffic Impact Analysis (TIA) will be required for all projects generating more than 400 passenger car equivalent trips per day. A TIA will include: trips generated by the project, trip distribution for the project, identification of intersections for which the project adds 30 or more peak hour passenger car equivalent trips, and level of service assessment, impacts of the project, and mitigation of the impacts. If the corridor is a State Highway, use ODOT standards. (MC-C-8-98)*

   Response: The Project would generate minimal amounts of traffic once in operation, likely less than 50 vehicle trips per day. On average, construction of the Project is likely to

generate fewer than 300 vehicle trips per day, but may generate more than 400 trips per day at peak times, depending on the timing of construction activities (see Exhibit U); however, construction traffic would be temporary and volumes will fluctuate. The traffic analysis in Exhibit U assumes that the entire Project would be constructed in a single phase, maximizing predicted construction traffic counts; however, the Project is likely to be built in several phases, such that construction activities are highly unlikely to generate more than 400 trips per day even at peak times. The Applicant will work with the Morrow County Road Department to identify specific construction traffic-related concerns, and will develop a traffic management plan prior to construction which will specify necessary traffic control measures to mitigate for the effects of the temporary increase in traffic volumes.

E. Increasing the amount of street dedication, roadway width or improvements within the street right-of-way.

1. It is the responsibility of the land owner to provide appropriate access for emergency vehicles at the time of development. (MC-C-8-98)

Response: All Project access roads will be constructed to accommodate heavy construction equipment, which will also make those roads suitable for emergency vehicles.

F. Designating the size, location, screening, drainage, surfacing or other improvement of a parking area or loading area.

Response: Parking and loading areas associated with the O&M building and substations will be surfaced with gravel, and will be graded to incorporate appropriate stormwater drainage to prevent erosion and offsite impacts. These facilities will be located and designed to comply with Morrow County standards. No screening or landscaping is currently proposed, as is consistent with most residential and agricultural facilities in the area; however, the Applicant will work with Morrow County either during the Site Plan Review process or at the building permit issuance stage to determine whether landscaping or screening may be necessary.

G. Limiting or otherwise designating the number, size, location, height, and lighting of signs.

Response: The Applicant does not propose any signage beyond a small business identification sign at the O&M facility, necessary safety signage at the substations, and a small identifying number sign on the base of each turbine. With the exception of the business identification sign, no commercial signage is proposed or will be permitted.

H. Limiting the location and intensity of outdoor lighting and requiring its shielding.

Response: The Project would have minimal outdoor lighting, at the O&M building and substation. Where outdoor lighting is necessary it will be shielded and aimed downward and inward to prevent offsite glare. Additionally, all outdoor lighting will use motion sensors and/or timers to ensure that lights are only on when needed. Red flashing lights must be installed atop select turbines per FAA marking requirements, but no other turbine lighting will be used.

I. Requiring diking, screening, landscaping or another facility to protect adjacent or nearby property and designating standards for its installation and maintenance.

Response: No screening or landscaping is currently proposed, as is consistent with most residential and agricultural facilities in the area; however, the Applicant will work with Morrow County either during the Site Plan Review process or at the building permit issuance stage to determine whether landscaping or screening may be necessary.

J. Designating the size, height, location and materials for a fence.

Response: No fencing is proposed; this standard is not applicable.

K. Protecting and preserving existing trees, vegetation, water resources, wildlife habitat or other significant natural resources.

Response: As described throughout this application, the Project is designed to protect and preserve existing natural resources to the extent practicable. The Project would have minimal effects on water resources, and no trees are expected to be affected. The Project has been designed to avoid impacts to critical habitat areas, and maintains the vast majority of the participating properties as open lands.

L. Other conditions necessary to permit the development of the County in conformity with the intent and purpose of this Ordinance and the policies of the Comprehensive Plan.

Response: Morrow County has not identified other potential conditions as necessary to achieve compliance with the MCDO or MCCP.

SECTION 6.050. STANDARDS GOVERNING CONDITIONAL USES.

A conditional use shall comply with the standards of the zone in which it is located and with the standards set forth in this subsection.

O. Radio, television tower, utility station or substation:

1. In a residential zone, all equipment storage on the site may be required to be within an enclosed building.

Response: The Project is not proposed within a residential zone, so this standard does not apply.

2. The use may be required to be fenced and provided with landscaping.

Response: The Project Substations, O&M Buildings and temporary Construction Yards will be fenced for security. No other fencing or landscaping is proposed. As a final stage of Project construction, areas temporarily disturbed will be restored and revegetated to conditions appropriate for the use of the area. Where the intended use of a temporary disturbance area is non-agricultural, the area will be revegetated using a seed mix consisting of primarily native plants, as described in the draft Revegetation Plan (see Exhibit P). Where the intended use of a temporary disturbance area is agricultural, the area will be reseeded per the requirements of the landowner. These actions will minimize the

long-term visual effects of the Project, such that additional fencing or landscaping would be unnecessary.

3. The minimum lot size for a public utility facility may be waived on finding that the waiver will not result in noise or other detrimental effects to adjacent property.

Response: The minimum lot size for a public utility facility is not applicable, as no new lots are being created and all Project assets are located on existing large EFU parcels which exceed the public utility facility lot size minimum.

4. Transmission towers, hoses, overhead wires, plumbing stations, and similar gear shall be so located, designed and installed as to minimize their conflict with scenic values.

Response: There are no identified scenic views or resources located within or in the vicinity of the Site Boundary. Nonetheless, the proposed Intraconnection Line(s) have been routed to minimize their visibility for area residents and travelers on public roads, and designed to minimize visual impact through the use of monopoles or wooden H-frames and non-reflective finishes. Collector Lines will be placed underground to the extent practicable.

2.1.4 Morrow County Solid Waste Management Ordinance

In its response to the Project's Notice of Intent, Morrow County identified its Solid Waste Management Ordinance as containing applicable substantive criteria. Morrow County later clarified that the Solid Waste Ordinance does not contain applicable substantive land use criteria; therefore the ordinance is not addressed in this Exhibit. The Solid Waste Management Ordinance is instead addressed in Exhibit V of this application.

2.1.5 Morrow County Weed Control Ordinance

In its response to the Project's Notice of Intent, Morrow County identified its Weed Control Ordinance as containing applicable substantive criteria. Morrow County later clarified that the Weed Control Ordinance does not contain applicable substantive land use criteria; therefore the ordinance is not addressed in this Exhibit. The Weed Control Ordinance is instead addressed in Exhibit P of this application.

As described in Exhibit P, Wheatridge shall develop and implement a Weed Management Plan meeting the requirements of the Morrow County Weed Control Ordinance and the requirements of the Morrow County Weed Control District Advisory Board. A draft weed control plan is incorporated into a draft Revegetation Plan provided with this application (see Exhibit P, Attachment P-2).

2.2 Applicable Criteria for Umatilla County

This Section demonstrates how the portion of the Project located in Umatilla County satisfies the Umatilla County applicable substantive criteria. In its April 12, 2013 response to the NOI, Umatilla County identified the following applicable substantive criteria:

- Umatilla County Development Ordinance (UCDO) Sections 152.060, 152.061, 152.615 and 152.616(HHH)
- The following Umatilla County Comprehensive Plan (UCCP) policies:
    - Citizen Involvement, Policies 1 and 5;
    - Agriculture, Policies 1, 8 and 17;
    - Open Space, Scenic & Historic Areas, and Natural Areas, Policies 1(a), 5(a & b), 6(a), 8(a), 9(a), 10(c, d & e), 20 (a), 20(b)(1-8), 22, 23(a), 24(a), 26, 37 & 38(a-c), 39(a) and 42(a);
    - Air, Land, Water Quality, Policies 1, 7 and 8;
    - Natural Hazards, Policies 1 and 4;
    - Recreational Needs, Policy 1;
    - Economy of the County, Policies 1, 4 and 8(a-f);
    - Public Facilities and Services, Policies 1(a-d), 2, 9 and 19;
    - Transportation, Policies 18 and 20; and
    - Energy Conservation, Policy 1.

These substantive criteria are discussed in Sections 2.2.1 and 2.2.2 below. Umatilla County also submitted other miscellaneous comments which are addressed below in Section 2.2.3.

2.2.1 UCDO Criteria

152.060 CONDITIONAL USES PERMITTED.

In an EFU zone the following uses may be permitted conditionally via administrative review (§ 152.769), subject to the requirements of this section, the applicable criteria in § 152.061, §§ 152.610 through 152.615, 152.617 and §§ 152.545 through 152.562. A zoning permit is required following the approval of a conditional use pursuant to § 152.025. Existing uses classified as conditional uses and listed in this section may be expanded subject to administrative review and subject to the requirements listed in OAR 660, Division 033.

(F) Commercial utility facilities for the purpose of generating power for public use by sale as provided in § 152.617 (I)(C). (For specific criteria for Wind Power Generation see § 152.617 (I)(W)[2])

> Response: The Project meets the definition of a commercial utility facility as defined in UCDO § 152.617 (I) (C). Upon issuance of an EFSC Site Certificate for the Project, Umatilla County shall issue a zoning permit without further conditions pursuant to ORS 469.401(3).

152.061 Standards for Conditional Uses on EFU lands.

[2] UCDO 152.617(I)(W) has been deleted in its entirety and the reader is cross-referenced to UCDO 152.616(HHH), which is discussed below.

The following limitations shall apply to all conditional uses in an EFU zone. Uses may be approved only where such uses:

(A) Will not force a significant change in accepted farm or forest practices on surrounding lands devoted to farm or forest use; and

(B) Will not significantly increase the cost of accepted farm or forest practices on lands devoted to farm or forest use.

Response: There is no forest use within the analysis area. As shown in Table K-2, within the Site Boundary in Umatilla County approximately 1,689 acres, or 99% of the area, are "devoted to farm use." Once built, permanent Project facilities would occupy (at most) approximately 24.37 acres, or about 1.4% of the agricultural lands within the Site Boundary in Umatilla County.

The lands devoted to farm use in Umatilla County are used primarily for cultivation of wheat and grazing of livestock, and related accessory uses. Figures K-5 and K-6 show the areas dedicated to farm use, as well as the areas defined by the UCDO as High Value Farmlands.

Table K-2. Impacts to Farmland in Umatilla County		
Total Area within Site Boundary in Umatilla County	1,702 acres	
Area Within Site Boundary in Umatilla County Devoted to Farm Use[1/]	1,689 acres total, of which 569.17 acres are High Value Farmland[2/]	
Acres Permanently Impacted by Project	**Not High Value Farmland**	**High Value Farmland[2/]**
Wheatridge West		
GE 1.7-103	0	0
GE 2.5-120	0	0
Wheatridge East		
GE 1.7-103	14.97	9.36
GE 2.5-120	14.42	9.20
Intraconnection Lines		
Option 1 (Longest)	0.02	0.02
Option 3 (Shortest)	0.02	0.02
SUBTOTALS (worst-case scenario)[3/]	14.99	9.38
TOTAL (worst-case scenario)	**24.37 acres**	

1/ Consistent with the definition of "farm use" in ORS 215.203 and OAR 660-033-0020(7), all land shown on Figures K-5 and K-6 as Developed-Dryland Wheat, Developed-Irrigated Agriculture, Developed-Revegetated or Other Planted Grassland, Grassland-Exotic Annual and Grassland-Native Perennial has been included in the calculation of land devoted to farm use for this Exhibit.

2/ Pursuant to UCDO 152.616(HHH)(6)(k) this calculation applies the definition of "high-value farmland" from ORS 195.300(10) for lands in Eastern Oregon: land with soils that are irrigated or not irrigated, and classified as prime, unique, Class I or Class II by the USDA National Resource Conservation Service (NRCS); and lands within the Columbia Basin Viticultural Area (which encompasses the entirety of the Project Area) that are below 3,001 feet elevation, with slopes no greater than 15% and an aspect between 67.5 and 292.5 degrees.

3/ The worst-case scenario is the GE 1.7-103 layout with the longest Intraconnection Line.

The impact of the Project would not force a significant change in accepted farm practices or significantly increase the cost of farm practices, for the reasons discussed below:

- Facility components and temporary construction laydown and staging areas would be sited to minimize disturbance to farming operations.
- Land permanently lost to farm use due to siting of permanent Project improvements is a de minimis percentage of the total farm use land in Umatilla County; therefore the inability to use the land for farm purposes is not significant.
- Project Site Access Roads and other facilities would be constructed and maintained by Wheatridge, such that the cost burden for maintenance does not fall upon the farm or ranch owners.
- Private access roads improved or developed for the Project would benefit agricultural users of the land through improved access to farm fields and resulting lower fuel costs.

- As part of the lease agreements, each landowner must approve the site plan for facilities located on his lands; this mechanism assures that Project facilities would not be considered disruptive to the practices of each landowner.
- Wheatridge has confirmed that no landowners in the Project Area utilize aerial spraying of pesticides or fertilizers; the Project would not affect the application of pesticides or fertilizers using ground-based methods.
- Wheatridge will implement a weed control plan that will reduce the risk of weed infestation in cultivated land and the associated cost to the farmer for weed control.
- Wheatridge will record a covenant not to sue against its Project leasehold interests with regard to generally accepted farming practices on adjacent farmland.
- Construction and operation of the Project could cause changes in routes of access to fields and changes in the pattern of cultivation, seeding, fertilizing and harvesting near the turbines and access roads. To minimize this, Wheatridge, in consultation with the landowners, will minimize obstacles to farming in cultivated fields (facility components around which the farmer would have to plow, plant and harvest).
- Wheatridge will consult with area landowners during construction and operation of the facility to determine further measures to reduce or avoid any adverse impacts to farm practices on surrounding lands and to avoid any increase in farming costs.
- Construction of the Project could adversely affect soil quality by erosion or compaction. Some farmland would be temporarily disturbed and unavailable for farming during construction. To avoid or reduce adverse impacts to soil quality, Wheatridge will implement dust control and erosion-control measures during construction and operation of the facility (see Exhibit I). To the extent practicable, Wheatridge proposes to reduce impact to soils by using areas that are already disturbed and limiting the area of new disturbance.
- Construction vehicles will use previously disturbed areas including existing roadways and tracks. When practical, temporary Construction Yards and laydown areas will be located within the future footprint of permanent structures. The width of new permanent roadways will be the minimum consistent with safe use. Underground communication and electrical lines will be buried within the area disturbed by temporary road widening to the extent practicable, and turbine foundations will abut roadways as closely as possible. Upon completion of construction, Wheatridge will restore temporarily disturbed areas to their pre-construction condition.

The measures above are intended to avoid or minimize the impacts of the Project on farming operations, and to mitigate for necessary impacts. The Project is designed and legally structured such that the cost burden of constructing and maintaining access roads and other facilities would not fall on the landowner and would not increase the costs of farming for affected landowners. Additionally, each participating landowner will be compensated for the loss of agricultural lands,

and the new income stream from lease payments will help to stabilize often-fluctuating agricultural income, making farming more sustainable.

152.615 Additional Conditional Use Permit Restrictions

In addition to the requirements and criteria listed in this subchapter, the Hearings Officer, Planning Director or the appropriate planning authority may impose the following conditions upon a finding that circumstances warrant such additional restrictions: [list of conditions omitted for brevity]

> Response: To the extent any restrictions or conditions of the type listed in Section 152.615 are deemed necessary to mitigate the impacts of the Project, they can and will be implemented through the EFSC Site Certificate process. ORS 469.401(2).

152.616 (HHH) Conditional use criteria for commercial wind energy facilities

> Response. UCDO 152.616(HHH)(1) provides that the procedural requirements of 152.616(HHH)(1) through (5) do not apply to a wind energy facility permitted via an EFSC Site Certificate. UCDO 152.616(HHH)(1) through (4) contain only procedural requirements, while UCDO 152.616(HHH)(5) provides both procedural and substantive requirements in the form of a list of conditional use application submittal requirements. Consequently, this application only discusses the substantive criteria of 152.616(HHH)(5) through (11)

152.616(HHH)(5) Application Requirements

The following information shall be provided as part of the application, or subject to the County's discretionary authority, be require prior to the construction or operation of the Wind Power Generation Facility through a condition of approval: [subsections (a) through (l) omitted for brevity]

> Response. UCDO 156.616(HHH)(5) lists information that would be required as part of an application for a County Conditional Use Permit. The information submitted as part of this application, and information that will be provided as a condition of approval attached to the Site Certificate, satisfy all of the information requirements identified by Umatilla County.

152.616(HHH)(6) Standards/Criteria of Approval.

The following requirements and restrictions apply to the siting of a Wind Power Generation Facility:

(a) Setbacks. The minimum setback shall be a distance of not less than the following:

(1) From a turbine tower to a city urban growth boundary (UGB) shall be two miles. The measurement of the setback is from the centerline of a turbine tower to the edge of the UGB that was adopted by the city as of the date the application was deemed complete.

> Response: The Project is consistent with this standard. The Site Boundary is located no closer than 5.5 miles from the nearest UGB in Umatilla County, for the city of Echo.

(2) From turbine tower to land zoned Unincorporated Community (UC) shall be 1 mile.

Response: The Project is consistent with this standard. There are no lands zoned UC within one mile of the Site Boundary.

(3) From a turbine tower to a rural residence shall be 2 miles. For purposes of this section, "rural residence" is defined as a legal, existing single family dwelling meeting the standards of §152.058 (F)(1)-(4), or a rural residence not yet in existence but for which a zoning permit has been issued, on a unit of land not a part of the Wind Power Generation Facility, on the date a Wind Power Generation Facility application is submitted. For purposes of this section, the setback does not apply to residences located on properties within the Wind Power Generation Facility project application. The measurement of the setback is from the centerline of the turbine tower to the center point of the rural residence.

Response: The Project is consistent with this standard. There is only one dwelling within Umatilla County located within two miles of any turbines, and it is located on a unit of land that is part of the Project. See Figures K-7 and K-8.

(4) From a turbine tower to the boundary right-of-way of County Roads, state and interstate highways, 110% of the overall tower-to-blade tip height. Note: The overall tower-to-blade tip height is the vertical distance measured from grade to the highest vertical point of the blade tip.

Response: Because the tallest turbine type under consideration is 145 meters (476 feet) in overall height, the minimum setback would be 159.5 meters (523 feet). The micrositing corridors are defined such that any turbine will be a minimum of 160 meters (525 feet) from the right-of-ways of any public roads. The Project is, therefore, in compliance with this requirement.

(5) From tower and project components, including transmission lines, underground conduits and access roads, to known archeological, historical or cultural sites shall be on a case by case basis, and for any known archeological, historical or cultural site of the Confederated Tribes of the Umatilla Indian Reservations the setback shall be no less than 164 feet (50 meters).

Response: The Project is designed to maintain a minimum 50 meter setback to all identified archaeological, historic and cultural resources of the CTUIR in Umatilla County. Additionally, the Project has been designed to avoid impacts to all other known archaeological, historic and cultural resources deemed eligible or potentially eligible for listing on the National Register of Historic Places. In only one case would any Project infrastructure be located closer than 50 meters to a listed or potentially eligible historic resource in Umatilla County that is not associated with the CTUIR: the remaining evidence of the Vey Ranch phone line. A Project access road must cross what was once a linear feature but is now only a collection of widely scattered roadside utility poles with no wiring (although some are now used as fence posts); the remaining poles at this location are close enough to each other that it is not possible to achieve a setback of 50 meters. The access road would be approximately centered between two existing poles that are approximately 94.5 meters (310 feet) apart, yielding a setback of approximately 41 meters to each pole. This access road routing maximizes the setback to each pole and avoids direct impacts to

the remaining evidence of the Vey Ranch Phone Line. In the event of unforeseen discoveries during construction, Wheatridge would immediately stop work in the area of the discovery and respond as described in Exhibit S.

(6) New electrical transmission lines associated with the project shall not be constructed closer than 500 feet to an existing residence without prior written approval of the homeowner, said written approval to be recorded with county deed records. Exceptions to the 500 feet setback include transmission lines placed in a public right of way. Note: Transmission and distribution lines constructed and owned by the applicant that are not within the project boundary are subject to a separate land use permit.

Response: No dwellings in Umatilla County are located within 500 feet of the Intraconnection Line(s). Wheatridge does not intend to construct or own any other transmission or distribution lines outside the Site Boundary in connection with the Project.

(7) The turbine/towers shall be of a size and design to help reduce noise or other detrimental effects. At a minimum, the Wind Power Generation Facility shall be designed and operated within the limits of noise standard(s) established by the State of Oregon. A credible noise study may be required to verify that noise impacts in all wind directions are in compliance with the State noise standard.

Response: The analysis presented in Exhibit X demonstrates that the Project is designed and can be operated within the limits of the State of Oregon's noise standards.

(b) Reasonable efforts shall be made to blend the wind turbine/towers with the natural surrounding area in order to minimize impacts upon open space and the natural landscape.

Response: Although no part of the analysis area is designated open space, the Project nonetheless is designed to minimize impacts upon undeveloped lands and the natural landscape by utilizing existing farm access roads as much as possible, and by siting roads at the edges of farm fields rather than in native grasslands where possible. This approach minimizes the need for grading and cut-and-fill slopes, allowing the Project to maintain natural contours to the greatest extent practicable. The turbines shall be painted standard white per FAA guidelines.

(c) The development and operation of the Wind Power Generation Facility will include reasonable efforts to protect and preserve existing trees, vegetation, water resources, wildlife, wildlife habitat, fish, avian, resources, historical, cultural and archaeological site.

Response: The Project design and development plan include efforts to protect and preserve existing vegetation, wildlife and wildlife habitat (including avian resources), and historic, cultural and archeological resources, as described in Exhibits P, Q and S. The Project would have no impact upon fish or water resources, as described in Exhibits J and O.

(d) The turbine towers shall be designed and constructed to discourage bird nesting and wildlife attraction.

Response: The considered turbine types are designed to discourage bird nesting and wildlife attraction. The turbine towers are hollow cylinders that do not provide perching or nesting opportunities. Likewise, the turbine nacelles are constructed with a smooth outer shell that does not facilitate perching or nesting.

(e) Private access roads established and controlled by the Wind Power Facility shall be gated and signed to protect the Wind Power Generation Facility and property owners from illegal or unwarranted trespass, illegal dumping and hunting and for emergency response.

Response: The Project is consistent with this standard. Wheatridge will install gates and no-trespassing signs at all access roads established or improved for the purpose of Project construction and operation.

(f) Where practicable the electrical cable collector system shall be installed underground, at a minimum depth of 3 feet; elsewhere the cable collector system shall be installed to prevent adverse impacts on agriculture operations.

Response: The electrical collector system lines will be installed underground to the extent practicable. In agricultural fields, the minimum depth will be 3 feet such that they would not interfere with or be susceptible to damage from agricultural operations. In other areas the lines will be established as deep as practicable and will be designed and constructed to comply with National Electrical Safety Code (NESC) standards.

(g) Required permanent maintenance/operations buildings shall be located off site in one of Umatilla County's appropriately zoned areas, except that such a building may be constructed on site if:

(1) The building is designed and constructed generally consistent with the character of similar buildings used by commercial farmers or ranchers, and

(2) The building will be removed or converted to farm use upon decommissioning of the Wind Power Generation Facility consistent with the provisions of §152.616 (HHH) (7).

Response: Any O&M Building constructed in Umatilla County will be a one-story building of about 6,000-9,000 square feet with adjacent parking, similar in appearance and construction to agricultural buildings commonly found in Umatilla County, and will be constructed within the Site Boundary. Upon decommissioning of the Project, Wheatridge will either convey the building to the underlying landowner for farm use or remove it in accordance with its approved decommissioning plan. The County will be protected against decommissioning costs pursuant to the decommissioning bond discussed in Exhibit W.

(h) A Wind Power Generation Facility shall comply with the Specific Safety Standards for Wind Energy Facilities delineated in OAR 345 024 0010 (as adopted at time of application).

Response: The Project is consistent with the Specific Safety Standards for Wind Energy Facilities, as discussed in Exhibit DD.

(i) A Covenant Not to Sue with regard to generally accepted farming practices shall be recorded with the County. Generally accepted farming practices shall be consistent with the definition of Farming

Practices under ORS 30.930. The Wind Power Generation Facility owner/operator shall covenant not to sue owners, operators, contractors, employees, or invitees of property zoned for farm use for generally accepted farming practices.

Response: Wheatridge will record a Covenant Not to Sue against its leasehold interests prior to construction of the Project.

(j) Roads.

(1) County Roads. A Road Use Agreement with Umatilla County regarding the impacts and mitigation on county roads shall be required as a condition of approval.

Response: Wheatridge acknowledges and will accept a condition of approval requiring that it enter into a Road Use Agreement with Umatilla County prior to beginning construction on the Project. Under the terms of the agreement, Wheatridge will leave all public roads utilized during construction of the Project in as good or better condition as exists at the time construction commences.

(2) Project Roads. Layout and design of the project roads shall use best management practices in consultation with the Soil Water Conservation District. The project road design shall be reviewed and certified by a civil engineer. Prior to road construction the applicant shall contact the State Department of Environmental Quality and if necessary, obtain a storm water permit (National Pollution Discharge Elimination System).

Response: Wheatridge will implement best management practices for storm water management as described in Exhibit I, and as will be required under the terms of the NPDES permit and the associated Erosion and Sediment Control Plan (ESCP). All Project roads will be designed and reviewed by certified civil engineer.

(k) Demonstrate compliance with the standards found in OAR 660-033-0130 (37).

OAR 660-033-0130(37) provides, in pertinent part, as follows:

(37) … A proposal for a wind power generation facility shall be subject to the following provisions:

(a) For high-value farmland soils described at ORS 195.300(10), the governing body or its designate must find that all of the following are satisfied:

(A) Reasonable alternatives have been considered to show that siting the wind power generation facility or component thereof on high-value farmland soils is necessary for the facility or component to function properly or if a road system or turbine string must be placed on such soils to achieve a reasonably direct route considering the following factors:

(i) Technical and engineering feasibility;

(ii) Availability of existing rights of way; and

(iii) The long term environmental, economic, social and energy consequences of siting the facility or component on alternative sites, as determined under paragraph (B);

Response: As shown in Table K-2 and Figures K-5 and K-6, approximately one-third of the land within the analysis area in Umatilla County is high-value farmland. Within Umatilla County, the Project would permanently impact up to approximately 9.38 acres of high value farmland, which represents approximately 1.6% of the high value farmland within the Site Boundary in Umatilla County. As shown on Figures K-5 and K-6, surrounding lands within the analysis area have the same land use classifications, similar uses, and a similar proportion of high-value farmland as lands outside the Site Boundary, making any alternative siting unlikely to materially reduce the impact on high-value farmland while still meeting Project objectives.

Based on the proportion and location of high value farmland in and around the Project Area, it is not possible to completely avoid or to substantially further reduce impacts to high value farmlands without compromising the technical feasibility of the Project. Wind energy projects have specific siting needs that require turbines to be located near the tops of hills and ridges, away from objects or landforms that could shield the wind or cause turbulence. The relationship between turbine sites is also strictly controlled so as to avoid turbulence impacts from one turbine on another. Consequently, changing the proposed Project layouts would likely have significant detrimental economic and energy-generation impacts on the Project. Additionally, the location of turbines and associated facilities must be approved by each participating landowner pursuant to Wheatridge's lease agreements; the Project has been designed with landowner input to minimize disruption to current agricultural lands and practices, and does so in large part by utilizing existing agricultural access routes and placing turbines at the edges of farm fields.

Although some adjustments to facility locations are expected to occur during final engineering design, which are expected to result in further reductions of impacts, neither minor adjustments nor significant relocations of Project facilities would be likely to materially reduce the impact on high value farmland, due to the high proportion of high value farmland within the Site Boundary. Moreover, even if the Project were to be developed on similar agricultural lands in the general area, it is unlikely that a similar project would have significantly lower impacts to high value farmland or lands dedicated to agricultural use due to the similar land uses and proportion of high value farmland in the surrounding area. Development of the Project in another location would require a similar amount of land disturbance, and would likely have similar social and environmental consequences as the proposed Project.

Consequently, the evidence shows that feasible alternative layouts are not available that materially lessen the impacts on high-value farmland while still meeting Project objectives and not causing or increasing other adverse impacts.

(B) The long-term environmental, economic, social and energy consequences resulting from the wind power generation facility or any components thereof at the proposed site

with measures designed to reduce adverse impacts are not significantly more adverse than would typically result from the same proposal being located on other agricultural lands that do not include high-value farmland soils;

Response: High-value farmlands and lands dedicated to agricultural use are found throughout the Project Area and the surrounding vicinity, such that any chosen location in the general area would be likely to encompass similar proportions of both high value farmland and agricultural lands. Additionally, due to the way that high value farmlands are defined, it is unlikely that a significant amount of agricultural land that is not also classified as high value farmland and is suitable to wind energy development could be found in the vicinity. The impact avoidance and minimization measures described throughout this application would be implemented during project design, construction and operation regardless of specific location. Therefore, even if the entire Project were to be moved elsewhere in the vicinity, it would have a similar level of impacts as a whole, and similar levels of impacts to high value farmland and lands dedicated agricultural use as the Project as proposed in this application.

(C) Costs associated with any of the factors listed in paragraph (A) may be considered, but costs alone may not be the only consideration in determining that siting any component of a wind power generation facility on high-value farmland soils is necessary;

Response: See response to subsection (A) above. Feasible alternatives affecting materially less high-value farmland are not available in the general area, regardless of cost.

(D) The owner of a wind power generation facility approved under subsection (a) shall be responsible for restoring, as nearly as possible, to its former condition any agricultural land and associated improvements that are damaged or otherwise disturbed by the siting, maintenance, repair or reconstruction of the facility. Nothing in this subsection shall prevent the owner of the facility from requiring a bond or other security from a contractor or otherwise imposing on a contractor the responsibility for restoration; and

Response: The Applicant will meet all County requirements to ensure decommissioning, as described below in response to 152.616(HHH)(l).

(E) The criteria of subsection (b) are satisfied.

Response: The requirements of OAR 660-033-0130(37) subsection (b) are addressed below:

(b) For arable lands, meaning lands that are cultivated or suitable for cultivation, including high-value farmland soils described at ORS 195.300(10), the governing body or its designate must find that:

(A) The proposed wind power facility will not create unnecessary negative impacts on agricultural operations conducted on the subject property. Negative impacts could include, but are not limited to, the unnecessary construction of roads, dividing a field or multiple fields in such a way that creates small or isolated pieces of property that are more difficult to farm, and placing wind farm components such as meteorological towers on lands in a manner that could disrupt common and accepted farming practices;

Response: Measures to be taken by the Applicant to minimize the negative impacts on agricultural operations on the underlying property are outlined above in response to UCDO 152.061. As discussed above, the impact of the Project would not force a significant change in accepted farm practices or significantly increase the cost of farm practices, for the reasons discussed below:

- Facility components and temporary construction laydown and staging areas would be sited to minimize disturbance to farming operations.
- Land permanently lost to farm use due to siting of permanent Project improvements is a de minimis percentage of the total farm use land in Umatilla County; therefore the inability to use the land for farm purposes is not significant.
- Project Site Access Roads and other facilities would be constructed and maintained by Wheatridge, such that the cost burden for maintenance does not fall upon the farm or ranch owners.
- Private access roads improved or developed for the Project would benefit agricultural users of the land through improved access to farm fields and resulting lower fuel costs.
- As part of the lease agreements, each landowner must approve the site plan for facilities located on his lands; this mechanism assures that Project facilities would not be considered disruptive to the practices of each landowner.
- Wheatridge has confirmed that no landowners in the Project Area utilize aerial spraying of pesticides or fertilizers; the Project would not affect the application of pesticides or fertilizers using ground-based methods.
- Wheatridge will implement a weed control plan that will reduce the risk of weed infestation in cultivated land and the associated cost to the farmer for weed control.
- Wheatridge will record a covenant not to sue against its Project leasehold interests with regard to generally accepted farming practices on adjacent farmland.
- Construction and operation of the Project could cause changes in routes of access to fields and changes in the pattern of cultivation, seeding, fertilizing and harvesting near the turbines and access roads. To minimize this, Wheatridge, in consultation with the landowners, will minimize obstacles to farming in cultivated fields (facility components around which the farmer would have to plow, plant and harvest).

- Wheatridge will consult with area landowners during construction and operation of the facility to determine further measures to reduce or avoid any adverse impacts to farm practices on surrounding lands and to avoid any increase in farming costs.
- Construction of the Project could adversely affect soil quality by erosion or compaction. Some farmland would be temporarily disturbed and unavailable for farming during construction. To avoid or reduce adverse impacts to soil quality, Wheatridge will implement dust control and erosion-control measures during construction and operation of the facility (see Exhibit I). To the extent practicable, Wheatridge proposes to reduce impact to soils by using areas that are already disturbed and limiting the area of new disturbance.
- Construction vehicles will use previously disturbed areas including existing roadways and tracks. When practical, temporary Construction Yards and laydown areas will be located within the future footprint of permanent structures. The width of new permanent roadways will be the minimum consistent with safe use. Underground communication and electrical lines will be buried within the area disturbed by temporary road widening to the extent practicable, and turbine foundations will abut roadways as closely as possible. Upon completion of construction, Wheatridge will restore temporarily disturbed areas to their pre-construction condition.

The measures above are intended to avoid or minimize the impacts of the Project on farming operations, and to mitigate for necessary impacts. The Project is designed and legally structured such that the cost burden of constructing and maintaining access roads and other facilities would not fall on the landowner and would not increase the costs of farming for affected landowners. Additionally, each participating landowner will be compensated for the loss of agricultural lands, and the new income stream from lease payments will help to stabilize often-fluctuating agricultural income, making farming more sustainable.

(B) The presence of a proposed wind power facility will not result in unnecessary soil erosion or loss that could limit agricultural productivity on the subject property. This provision may be satisfied by the submittal and county approval of a soil and erosion control plan prepared by an adequately qualified individual, showing how unnecessary soil erosion will be avoided or remedied and how topsoil will be stripped, stockpiled and clearly marked. The approved plan shall be attached to the decision as a condition of approval;

Response: Mitigation of geologic impacts including soil erosion are discussed in Exhibits H and I, and in response to UCDO 152.061. Further, the Applicant will comply with the terms of its NPDES permit and the associated Erosion and Sediment Control Plan (ESCP).

(C) Construction or maintenance activities will not result in unnecessary soil compaction that reduces the productivity of soil for crop production. This provision may be satisfied by the submittal and county approval of a plan prepared by an adequately qualified individual, showing how unnecessary soil compaction will be avoided or remedied in a timely manner through deep soil decompaction or other appropriate practices. The approved plan shall be attached to the decision as a condition of approval; and

Response: Minimization of impacts to soil are discussed in Exhibit I and in response to UCDO 152.061.

(D) Construction or maintenance activities will not result in the unabated introduction or spread of noxious weeds and other undesirable weeds species. This provision may be satisfied by the submittal and county approval of a weed control plan prepared by an adequately qualified individual that includes a long-term maintenance agreement. The approved plan shall be attached to the decision as a condition of approval.

Response: As discussed in response to UDCO 152.061, Wheatridge will implement a weed control plan that will reduce the risk of weed infestation in cultivated land and the associated cost to the farmer for weed control.

(c) For nonarable lands, meaning lands that are not suitable for cultivation, the governing body or its designate must find that the requirements of OAR 660-033-0130(37)(b)(D) are satisfied.

Response: The Project is located primarily on arable lands, but would impact some non-arable lands as well. The above discussion demonstrates compliance with the requirements of OAR 660-033-0130(37)(b)(D).

(d) In the event that a wind power generation facility is proposed on a combination of arable and nonarable lands as described in OAR 660-033-0130(37)(b) and (c) the approval criteria of 660-033-0130(37)(b) shall apply to the entire project.

Response: The Project would impact some nonarable land around the edges of existing farm fields, thus would include both arable and nonarable lands. The above discussion demonstrates compliance with the approval criteria of OAR 660-033-0130(37)(b).

(l) Submit a plan for dismantling of uncompleted construction and/or decommissioning and/or re-powering of the Wind Power Generation Facility as described in §152.616 (HHH) (7).

Response: The Project is designed to have a useful life of approximately 50 years, at which time it may be repowered or decommissioned. If the Project is to be decommissioned, Wheatridge will provide a decommissioning plan to Umatilla County prior to beginning decommissioning activities. Providing a decommissioning/repowering plan prior to initial construction of the Project is not an optimal approach because technologies and practices for wind project decommissioning and repowering are certain to change significantly between Project approval and the time at which decommissioning or repowering becomes

necessary. The County will be protected against decommissioning costs pursuant to the decommissioning bond discussed in Exhibit W.

(m) A surety bond shall be established to cover the cost of dismantling uncompleted construction and/or decommissioning of the Wind Power Generation Facility, and site rehabilitation pursuant to §152.616 (HHH) (7) and (8). The intent of this requirement is to guarantee performance (not just provide financial insurance) to protect the public interest and the county budget from unanticipated, unwarranted burden to decommission wind projects. For projects being sited by the State of Oregon's Energy Facility Siting Council (EFSC), the bond or letter of credit required by EFSC will be deemed to meet this requirement.

Response: As described in Exhibit W, Wheatridge will provide a bond or letter of credit to cover the cost of site rehabilitation in the event of decommissioning or dismantling of uncompleted construction, which will also satisfy the County's standard.

(n) The actual latitude and longitude location or Stateplane NAD 83(91) (suitable for GPS mapping) coordinates of each turbine tower, connecting lines, O & M building, substation, project roads and transmission lines, shall be provided to Umatilla County on or before starting electrical production.

Response: Prior to beginning commercial operations, Wheatridge will provide actual locational data to Umatilla County and area emergency service providers, in a form to be agreed upon at that time.

(o) An Operating and Facility Maintenance Plan shall be submitted and subject to County review and approval.

Response: Prior to beginning commercial operations, Wheatridge will provide an Operating and Facility Maintenance Plan for Umatilla County's review and approval.

(p) A summary of as built changes to the original plan, if any, shall be provided by the Wind Power Generation Facility owner/operator 90 days of starting electrical production.

Response: Within 90 days after beginning commercial operations, Wheatridge will provide a summary of any as built changes to the original plan to Umatilla County.

(q) Submit a Socioeconomic Assessment of the Wind Power Generation Facility.

Response: A socioeconomic assessment of the impacts of the Project is provided as part of Exhibit U and will be reviewed and approved by EFSC.

152.616(HHH) (7) Dismantling/Decommissioning.

A plan for dismantling and/or decommissioning that provides for completion of dismantling or decommissioning of the Wind Power Generation Facility without significant delay and protects public health, safety and the environment in compliance with the restoration requirements of this section. [Detailed list of plan contents omitted for brevity.]

Response: The Project is designed to have a useful life of approximately 50 years, at which time it may be repowered or decommissioned. If the Project is to be decommissioned, Wheatridge will provide a decommissioning plan to Umatilla County prior to beginning

decommissioning activities. Providing a decommissioning/repowering plan prior to initial construction of the Project is not an optimal approach because technologies and practices for wind project decommissioning and repowering are certain to change significantly between Project approval and the time at which decommissioning or repowering becomes necessary. The County will be protected against decommissioning costs pursuant to the decommissioning bond discussed in Exhibit W.

152.616(HHH)(8) Decommissioning Fund.

The Wind Power Generation Facility owner/operator shall submit to Umatilla County a bond acceptable to the County, in the amount of the decommissioning fund naming Umatilla County beneficiary or payee. [Detailed list of bond conditions omitted for brevity.]

Response: As described in Exhibit W, Wheatridge will provide a bond or letter of credit to cover the cost of site rehabilitation in the event of decommissioning or dismantling of uncompleted construction, which will also satisfy the County's standard.

152.616(HHH)(9) Annual Reporting.

Within 120 days after the end of each calendar year the Wind Power Generation Facility owner/operator shall provide Umatilla County a written and oral annual report including the following information: [Detailed list of report contents omitted for brevity.]

Response: Wheatridge will provide Umatilla County with annual reports of Project operations, within 120 days of the end of each calendar year, meeting the requirements of this subsection.

152.616(HHH)(10)Permit Amendments.

The Wind Power Generation Facility requirements shall be facility specific, but can be amended as long as the Wind Power Generation Facility does not exceed the boundaries of the Umatilla County conditional use permit where the original Wind Power Generation Facility was constructed. … An amendment to a Site Certificate issued by EFSC will be governed by the rules for amendments established by [EFSC].

Response: As noted in the criterion, any amendment to the EFSC Site Certificate shall be processed with EFSC according to the applicable statutes and administrative rules governing amendment of Site Certificates.

152.616(HHH)(11) Walla Walla Watershed.

Response: This criterion applies only to land within the Walla Walla sub-basin east of Highway 11 and, as such, does not apply to this Project.

2.2.3 UCCP Policies

Citizen Involvement:

1. *Provide information to the public on planning issues and programs, and encourage continuing citizen input to planning efforts.*

   Response: The ASC approval process incorporates opportunities for citizen input on the planning and permitting process, through the NOI, scoping meetings, informal informational meetings, official notices to surrounding property owners and solicitation of comments, and the public hearings process. Accordingly, this UCCP policy regarding citizen involvement is satisfied.

5. Through appropriate media, encourage those County residents' participation during both city and County deliberation proceedings.

Response: The Site Certificate process with EFSC provides ample opportunity for public review of application materials and input into the planning process, including at least one hearing in the local area. The EFSC process is consistent with Statewide Land Use Planning Goal 1 regarding citizen involvement. Accordingly, the UCCP policies regarding citizen involvement are also met.

Agriculture:

1. Umatilla County will protect, with Exclusive Farm Use zoning pursuant to ORS 215, lands meeting the definition of farmland in this plan and designated as Agricultural on the Comprehensive Plan Map.

Response: Umatilla County has adopted zoning and allocated lands identified as Agricultural on the Comprehensive Plan Map to the Exclusive Farm Use zoning district pursuant to ORS 215. The Site Boundary is located entirely within the EFU zone. As discussed above, the proposed project meets the applicable substantive criteria of the Umatilla County EFU zone.

8. The county shall require appropriate procedures/ standards/policies be met in the Comprehensive Plan and Development Ordinance when reviewing non-farm uses for compatibility with agriculture.

Response: The Project is located in the EFU zone, and this exhibit demonstrates consistency with applicable substantive criteria for the EFU zoning district in Umatilla County.

17. Continue to encourage timber management to occur on lower elevation seasonal grazing as permitted in the Exclusive Farm Use Zone.

Response: As noted in Umatilla County's letter dated April 12, 2013, most but not all comprehensive plan policies are implemented by the UCDO. In the case of these agricultural policies, they are implemented by the regulations of the EFU zone including the substantive criteria of the UCDO discussed above in Section 2.2.1. Specifically with respect to policy 17, there is no active timber management within the Site Boundary in Umatilla County.

Open Space, Scenic & Historic Areas, and Natural Areas:

1. (a) The County shall maintain this resource [Open Space] by limiting development mainly to existing built up areas.

Response: The Project will be built on existing, cultivated farmlands and will consist of wind turbines spaced at large intervals, and supporting infrastructure, much of which will be

buried underground. The Project is located entirely on private land, none of which is designated as open space, and actually impacts only a very small percentage of the Project site. The Project site is crossed by several highways, and there is an existing wind energy facility immediately to the west. The Project will not significantly alter the rural, sparsely developed character of the Project lands. The impacts of the Project on scenic, protected and recreational areas are discussed in further detail in Exhibits R, L and T respectively.

5. (a) The County shall maintain rural agricultural lands, Development shall be of low density to assure retention of upland game habitat,

Response: Although the Project encompasses a fairly large geographic area, the density of developed areas due to the Project and existing land uses will remain very low, and the vast majority of land within the Site Boundary will remain undeveloped. Additionally, most Project impacts will occur on agricultural lands such that upland game habitat, and particularly the streams, wetlands and riparian areas on which game relies, will be minimally affected.

(b) Land uses should maintain the vegetation along stream banks, fence rows, woodlots, etc. Research ways to reduce harassment and loss of upland game by free roaming dogs and cats.

Response: Existing agricultural uses of the Project lands will be able to continue with minimal disruption after Project construction is complete. The Project is a widely spaced series of turbines with minimal supporting infrastructure, much of which is located underground; as such it will not interfere with game movement or habitat. Sensitive habitat and vegetated areas along stream banks, fence rows and woodlots will not be permanently disturbed by the Project. There are no characteristics of the Project that would attract or exacerbate the problem of free roaming dogs and cats.

6. (a) Developments or land uses that require drainage, channelization, filling or excessive removal of riparian vegetation in sensitive waterfowl areas should be identified.

Response: The Project does not require drainage, channelization, filling or excessive removal of riparian vegetation in sensitive waterfowl areas.

8. (a) Setbacks shall be established to protect significant and other wetlands.

Response: Setbacks shall be established and met as required by UCDO 152.616(HHH)(a) for wind energy facilities. The Project has been designed to avoid impacts to wetlands, and maintains sufficient setbacks from wetland edges to prevent indirect impacts to nearby wetlands.

9. (a) The County shall encourage land use practices which protect and enhance significant wetlands.

Response: The Project has no impact on wetlands in Umatilla County, as further discussed in Exhibit J.

10. (c) Compatible land use shall maintain the riparian vegetation along streams in the floodplain. Stream bank vegetation shall be maintained along streams outside of the floodplain by utilizing appropriate setbacks.

Response: The Project has been designed to avoid impacts to riparian or other stream bank vegetation. All setbacks required by the UCDO will be met.

(d) Development or land use that requires channelization, excessive removal of streamside vegetation, alteration of stream banks and filling into stream channels shall be restricted in order to maintain streams integrity.

Response: The Project has been designed to avoid nearly all impacts to streams, and would impact only ephemeral streams where access roads must cross. Where this would occur, all appropriate measures will be implemented to maintain stream integrity. The streams would be channelized only to the extent necessary to flow through a culvert under a road. Streamside vegetation removal will be avoided to the extent practicable, and areas disturbed temporarily will be restored to approximately original contours and reseeded with native species.

(e) New roads, bridges and access rights-of-way shall be designed to avoid channel capacity, and minimize removal of shoreline vegetation.

Response: These policies are largely addressed above. Any new or improved roads shall be sited in consultation with the affected landowner to minimize removal of shoreline vegetation, if any exists on the Project site. No new roads, bridges or access rights-of-way will adversely affect channel capacity.

20. (a) Developments of potentially high visual impacts shall address and mitigate adverse visual effects in their permit application, as outlined in the Development Ordinance standards.

Response: Visual impacts are mitigated as discussed in Exhibit R.

(b) It is the position of the County that the Comprehensive Plan designations and zoning already limit scenic and aesthetic conflicts by limiting land uses or by mitigating conflicts through ordinance criteria. However, to address any specific, potential conflicts, the County shall insure special consideration of the following when reviewing a proposed change of land use:

(1) Maintaining natural vegetation whenever possible.

(2) Landscaping areas where vegetation is removed and erosion might result.

(3) Screening unsightly land uses, preferably with natural vegetation or landscaping.

(4) Limiting rights-of-way widths and numbers of roads intersecting scenic roadways to the minimum needed to safely and adequately serve the uses to which they connect.

(5) Limiting signs in size and design so as not to distract from the attractiveness of the area.

(6) Siting Developments to be compatible with surrounding area developments and recognizing the natural chrematistics or the location.

(7) Limiting excavation and filling only to those areas where alteration of the natural terrain is necessary and re-vegetating such areas as soon as possible.

(8) Protection vistas and other views which are important to be recognized because of their limited number and importance to the visual attractiveness of the area.

Response: Wind energy projects are a conditional use in the Umatilla County EFU zone. As called for by this UCCP policy, aesthetic and scenic conflicts are already largely mitigated through the substantive criteria applicable to the Project. Additionally, there are no identified or designated scenic views or resources in the vicinity of the Project, indicating that there are no specific scenic or aesthetic conflicts to be addressed. Nonetheless, the Project incorporates many of the design guidance elements enumerated in this policy, minimizing aesthetic impacts as well as other impact types. For example, vegetation removal would be largely limited to agricultural crops, with very little impacts to native vegetation and no impacts to trees. Disturbed area will be revegetated as soon as practicable following construction to restore the visual quality of the land and to prevent erosion. Project access roads have been reduced to the minimum length needed to develop the Project, and they will be narrowed following construction to a minimum width needed for typical maintenance vehicles. No Project access roads intersect with designated scenic roadways. Signage will be limited to small identifying markers and "no trespassing" signs at the base of each turbine, safety signage within each Substation, and a small identifying sign at the O&M Buildings; commercial signage (e.g., advertising) is not proposed and will not be permitted. Electrical Collector Lines will be underground to the extent practicable, while the Intraconnection Corridor has been routed to minimize the visibility of the Intraconnection Line(s) from major public roads. The access road routes and turbine locations have been chosen to limit the need for cut and fill, and to follow existing terrain as much as possible. While the turbines represent a nontraditional structure on the landscape that cannot reasonably be screened, the O&M Buildings will appear similar to other existing agricultural structures in the area.

22. The County shall cooperate with state agencies and other historical organizations to preserve historic buildings and sites, cultural areas, and archeological sites and artifacts.

Response: The Project would not impact historic buildings, as there are none located within the Site Boundary. All other known historic, cultural and archaeological resources have been avoided through modifications to the Project layout. The CTUIR was contracted to survey the area for cultural and archaeological resources, and provided a full report of their findings to SHPO. In the event that previously undiscovered sites or artifacts are found during construction, Wheatridge will coordinate with SHPO regarding an appropriate course of action to conserve the resource. Avoidance of impacts to cultural or archaeological resources is discussed in Section 4 of this exhibit, and Exhibit S.

23. (a) Umatilla County shall encourage and cooperate in developing a detailed county-wide historic site inventory.

Response: Any historic site information developed in the course of Project development shall be provided for inclusion in the Umatilla County historic site inventory.

24. (a) Umatilla County shall protect significant historical and cultural sites from land use activities which diminish their value as historical resources.

Response: Avoidance of impacts to cultural or historical resources is discussed in Section 4 of this exhibit, and Exhibit S. All identified sites eligible or potentially eligible for regulatory protection are avoided as required by applicable standards, except as discussed in Section 4 of this exhibit. There are no sites within the Project area presently listed on the National Register of Historic Places.

26. The County shall cooperate with the Tribe, Oregon State Historic Preservation Office, and others involved in concern identifying and protecting Indian cultural areas and archeological sites.

Response: Wheatridge has cooperated and consulted with the CTUIR and Oregon SHPO regarding cultural and archaeological resources, and, except as discussed in Section 4 of this exhibit, all identified Indian cultural and archaeological sites eligible or potentially eligible for regulatory protection are avoided as required by applicable standards.

37. The County shall ensure compatible interim uses provided through Development Ordinance standards, and where applicable consider agriculturally designated land as open space for appropriate and eventual resource or energy facilities use.

Response: The Project is an energy facility on agricultural open space, as encouraged by this policy.

38. (a) The County shall encourage mapping of future agencies [sic] sites, ensure their protection from conflicting adjacent land uses, and required reclamation plans.

Response: The Project does not impact any known aggregate sites, and no Project landowner has disclosed the existence of any such sites or prospective sites within the Project area. The Project would not prevent the future development of aggregate or mineral extraction sites , and would not represent a conflicting land use that would adversely affect or be adversely affected by mining activities in the vicinity.

(b) Aggregate and mineral exploration, extraction, and reclamation shall be conducted in conformance with the regulations of the Department of Geology and Mineral Industries.

Response: The Project does not involve aggregate or mineral exploration, extraction or reclamation, and would not impact any existing aggregate or mineral extraction site except to the extent that the Project may purchase aggregate from an existing, permitted mine.

(c) The County Development Ordinance shall include conditional use standards and other provisions to limit or mitigate conflicting uses between aggregate sites and surrounding land uses.

Response: The Project does not impact any known aggregate sites, and no Project landowner has disclosed the existence of any such sites or prospective sites within the Project area. The Project does not include the development of any aggregate or other

mining sites. The Project complies with all applicable substantive criteria related to protection of aggregate resources.

39. (a) The County shall strictly enforce state and county development standards pertaining to gravel extraction/processing uses through appropriate agencies; whether new operations or expansions of existing sites.

Response: The Project does not propose any new mining sites, nor the expansion of existing mining sites. Wheatridge will obtain gravel as needed from permitted providers outside the Project area.

42. (a) Encourage development of alternative sources of energy.

Response: This is an alternative energy project in furtherance of this policy.

Air, Land, Water Quality:

1. Discharges from existing and future developments shall not exceed applicable environmental standards.

Response: Wheatridge will obtain and comply with an NPDES permit for storm water discharge, and shall follow best management practices to minimize discharges and emissions during construction. Once operational, the Project will not discharge any pollutants or other materials regulated by environmental law.

7. Consider cumulative noise impacts and compatibility of future developments, including the adoption of appropriate mitigating requirements of plan updates.

Response: Noise impacts and mitigation are discussed in Exhibit X, which demonstrates that the Project is designed and can be operated to comply with state noise regulations.

8. Recognize that protection of existing wells has priority over development proposals requiring additional subsurface sewage disposal.

Response: The only subsurface sewage disposal will be at the O&M Buildings, which will be located sufficiently far from any existing wells to avoid any potential conflict.

Natural Hazards:

1. The County will endeavor, through appropriate regulations and cooperation with applicable governmental agencies, to protect life and property from natural hazards and disasters found to exist in Umatilla County.

Response: The Project would incorporate many features protective of life and property, and is in an area largely free of natural hazards. The Project incorporates substantial setbacks to public roads and existing structures, such that it would not represent a hazard to public health or safety even in the event of a catastrophic failure. Project facilities, in particular the turbines, will be located away from known hazard areas, and structures, in particular the turbine foundations, will be designed and build to rigorous engineering standards as required by current building codes so that they can withstand earthquakes.

4. Potentially hazardous major developments (e.g. power plants) must address earthquake hazard possibilities.

Response: There are no known liquefaction, subsidence or landslide risk areas within the Project site in Umatilla County. All foundations will be built to applicable engineering standards for earthquake safety, and all County setbacks from other structures and roads will be observed, reducing the risk that Project improvements could collapse onto other structures or roads.

Recreation Needs:

1. Encourage and work with local, state, federal agencies and private enterprise to provide recreational areas and opportunities to citizens and visitors to the County.

Response: The Project does not impact any existing recreational resources.

Economy:

1. Encourage diversification within existing and potential resource-based industries.

Response: The Project represents a diversification of existing resource-based industries. The existing economic use of Project land – agriculture – will not be significantly impacted by the Project, so the Project is an addition to the County economy rather than a replacement of one economic use for another.

4. Participate in selected economic development programs and projects applicable to the County desired growth.

Response: The Project monetizes the wind resource of Umatilla County without injury to other wind projects or natural resource uses. The Project will generate economic growth and jobs within Umatilla County.

8. Evaluate economic development proposals upon the following:

Will the proposal:

a. increase or decrease available supplies?

b. improve or degrade qualities?

c. balance withdrawal with recharge rates?

d. be a beneficial use?

e. have sufficient quantities available to meet needs of the proposed project and other existing and reassembly anticipated needs?

f. reduce other use opportunities and if so, will the loss be compensated by other equal opportunities?

Response: All of these policies are advanced by the Project. The Project monetizes the wind resource of Umatilla County without injury to other wind projects or natural resource uses. The Project will generate economic growth and jobs within Umatilla County. The Project has

no effect on natural resource supplies or quality, and will be a net beneficial use by reducing the need for carbon-intensive energy sources. The primary energy input – wind – is free and limitless. The existing economic use of Project land – agriculture – will not be significantly impacted by the Project, so the Project is an addition to the County economy rather than a replacement of one economic use for another. Additionally, the landowners' loss of available agricultural land will be compensated by lease payments to each landowner.

Public Facilities and Services:

1. The county will control land development in a timely, orderly, and efficient manner by requiring that public facilities and services be consistent with established levels of rural needs consistent with the level of service requirements listed on pages J-27 and J-28 of the Technical Report. Those needs are identified as follows:

a. Fire protection shall be provided consistent with Policies 8,9.,10.

Response: Policies 8, 9 and 10 call for the formation or expansion of rural fire districts in areas designated for non-resource use; the provision of adequate fire fighting water supplies for significant new rural developments in coordination with the appropriate fire district; and assistance by the County in locating satellite fire stations, respectively. As described in Exhibit U, the Project is located in an area served by several fire protection agencies. If the area within the Site Boundary is not already covered by an existing fire department, Wheatridge will work with one or more of the local fire districts, to extend under contract their coverage to the area(s) in question. During construction, and particularly during activities that present a potential fire hazard, Wheatridge will maintain water trucks on site for rapid response in the event of a fire. None of the fire departments have suggested that water supplies should be maintained for the Project; any specific requirements will be determined prior to beginning construction. The development of the Project would not preclude the use of other portions of the participating properties for use as the location of a future fire station.

b. Police protection shall be provided consistent with Policy 7.

Response: Policy 7 calls for the allocation of county funding to maintain at least the state average of 0.34 officers per 1,000 people. The Project would have 10 to 15 permanent employees, some of whom may be new residents in Umatilla County; however, the addition of a small number of families would not significantly affect the provision of police services. Additionally, the Project will contribute toward funding of police services through increase taxes, allowing the County to maintain this minimum level of service.

c. Surface. Water Drainage-Roadside drainage shall be maintained and plans for drainage shall be required in multiple use areas.

Response: Roadside drainage will be maintained on all roads developed or improved for the county, including at locations where Project access roads intersect county roads or state

highways. The specific requirements for roadside drainage will be determined through the NPDES permit and the associated Erosion and Sedimentation Control Plan.

d. Roads shall be maintained or improved to standards adopted by the County Road Department which are consistent with nationally accepted standards that correlate traffic to desired road conditions.

Response: Exhibit U demonstrates the adequacy of public services to serve the Project, and also that the impact of the Project on those services will not be significant.

2. Require that domestic water and sewage disposal systems for rural areas be provided and maintained at levels appropriate for rural use only. Rural services are not to be developed to support urban uses.

Response: Water supply and sewage disposal plans for the Project are consistent with the rural nature of the site. Once in operation the Project will not have significant water needs; water for the O&M Buildings will be provided by an exempt well. Construction water will be obtained from municipal water suppliers in quantities within the service capacity of those providers, and hauled to the Project site. Sewage disposal will be handled by an onsite septic system.

9. Require adequate water supplies for firefighting as part of significant new developments in rural areas in coordination with the appropriate rural fire district.

Response: Wind projects do not pose a significant fire risk. This policy is directed more at occupied development such as residential and commercial buildings. Nonetheless, Wheatridge has confirmed the adequacy of fire protection services in Umatilla County as discussed in Exhibit U.

19. Where feasible, all utility lines and facilities shall be located on or adjacent to existing public or private rights-of-way so as to avoid dividing existing farm or forest units; and transmission lines should be located within existing corridors as much as possible.

Response: Electrical Collector Lines will be placed adjacent to Project access roads, which are routed to avoid dividing existing farm fields and generally follow existing farm access tracks. Due to the location of the turbines it is not practical to place electrical Collector Lines in public rights-of-way. There are no existing transmission corridors in the vicinity of the Project that could be used to electrically connect Wheatridge East and Wheatridge West, therefore the route has been chosen to limit the visibility of the Intraconnection Line(s) from major public roads and minimize the lines' visual impact.

Transportation:

18. The County will review right-of-way acquisitions and proposals for transmission lines and pipelines so as to minimize adverse impacts on the community.

Response: No right-of-way acquisitions are needed for the Project. Electric transmission lines that are part of the Project will be reviewed by EFSC as part of this Site Certificate application.

20. Request larger industrial and commercial development proposals, consider sponsoring carpooling programs.

Response: The Project will permanently employ 8-12 people in a rural location. It will not generate enough traffic to justify carpooling arrangements.

Energy Conservation:

1. Encourage rehabilitation /weatherization of older structures and the utilization of locally feasibly renewable energy resources through use of tax and permit incentives.

Response: The Project does not involve the reuse of existing structures. The Project is a wind energy facility that utilizes locally feasible renewable energy resources, in furtherance of this policy.

2.2.3 Other Miscellaneous Comments from Umatilla County

Umatilla County notes that the Gen-tie Line delivering power from the Project to the point of interconnection (POI) has not been identified as a related and supporting facility. The Gen-tie Line, which will be proposed and permitted separately by UEC or UEC/CB, does not meet the definition of a "related and supported facility" under ORS 469.300(24) and OAR 345-001-0010(49) because it is not proposed by the applicant, and because it is not certain that the transmission line "would not be built [by UEC or UEC/CB] but for construction or operation" of the Project. As noted in Umatilla County's April 12, 2013 letter, it is anticipated that EFSC will condition any Site Certificate on proper permitting and construction of the gen-tie line and any associated Substation, and Wheatridge has no objection to such a condition.

Umatilla County requests that operation and maintenance of the Gen-tie Line be addressed in this application. It also states that it may require Wheatridge to survey any transmission route located in county road right-of-way. Since the Gen-tie Line is a separate and independent project to be permitted, built and operated by UEC or UEC/CB, and not a "related and supporting facility" to this Project, Umatilla County's assertions are misplaced. Siting, operations and maintenance issues for the gen-tie line will be addressed in the UEC or UEC/CB transmission line permitting process. Similarly, Umatilla County can work through the available regulatory processes to ensure that UEC or UEC/CB constructs the gen-tie line in accordance with NESC standards.

Umatilla County refers to a new 5-10 acre private substation adjacent to a BPA substation; however, Wheatridge has not included such a substation as part of the Project. The option for a private substation was discussed in the Notice of Intent but is no longer part of the Project.

Access road standards are discussed above in Section 2.2.1 in response to UCDO 152.616(HHH). Wheatridge acknowledges that a Road Use Agreement will be required for Project use of County roads.

Umatilla County has identified the Umatilla County Transportation System Plan as a source of policies and standards that may apply to the Project. Umatilla County has identified Transportation policies 18 and 20 specifically, and those have been addressed in Section 2.2.2 above. As noted above, Wheatridge will comply with the UCDO requirements for access roads and enter into a Road Use Agreement with Umatilla County to use county roads and ensure that they are left in "as good or better" condition following completion of Project construction as currently exists.

Wheatridge will agree to a condition requiring the filing of an Emergency Response Plan with Umatilla County.

3.0 LCDC Administrative Rules

The Project Order requires the Applicant to identify any LCDC administrative rules and goals and any land use statutes that apply directly to the Project. Pursuant to OAR 660-033-0120, wind power generation facilities must comply with the standards set forth in OAR 660-033-0130(5) and (37). The standards of OAR 660-033-0130(5) are discussed above in response to MCZO 3.010(D) and UCDO 152.061. The standards of OAR 660-033-0130(37) are discussed above in response to UCDO 152.616(HHH)(6)(k). All standards are met.

4.0 MCZO 3.010(D) - Goal 3 Exception

As shown in Table K-1, under the "worst-case" scenario, the Project will permanently impact about 146.27 acres of land devoted to farm use in Morrow County, of which about 0.01 acres is high-value farmland and about 146.26 acres is not high-value farmland. MCZO 3.010(D)(16) limits the permissible impacts to 12 acres of high-value farmland or 20 acres of other land devoted to farm use unless an exception is approved pursuant to OAR 660 Division 4. The Project impacts would be less than the 12 acre cap for high value farmland. However, it will impact more than 20 acres of non-high-value farmland that is devoted to farm use in Morrow County, so a Goal 3 exception is needed.

ORS 469.504(2) provides that, notwithstanding the requirements of ORS 197.732 or applicable LCDC rules, EFSC may approve a goal exception for an energy facility in any of three circumstances as described in ORS 469.504(2)(a), (b), or (c). See also OAR 345-022-0030(4)(c). In this case, an exception to Goal 3 to permit permanent impacts to more than 20 acres of non-high-value farmland is warranted as a "reasons" exception under ORS 469.504(2)(c) and OAR 345-022-0030(4)(c) because the Project is a locationally dependent facility that will significantly advance important state and local goals for renewable energy development and economic growth, while having minimal impacts on agricultural use.

ORS 469.504(2)(c) and OAR 345-022-0030(4)(c) require the following:

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

Response: As discussed above in Section 2 in response to MCZO 3.010(D) and UCDO 152.061, the Project will not have significant adverse effects on accepted farm or forest practices. Beyond that, an exception to Goal 3 for the Project is justified for three primary reasons.

1. The Project is locationally dependent and cannot be developed on non-agricultural lands while still meeting the overall Project objective to take advantage of excellent wind resources in the general area. Neither County has sufficient non-agricultural land to support a wind energy facility, and the Applicant is unaware of any meteorological information showing significant, developable wind resources on any non-agricultural land in the general area of the Project. The only significant non-agricultural land in the general area of the Project is in cities and towns, which are not suitable locations for a wind energy facility and do not have the necessary wind resources, adequately sized parcels of land, or proximate transmission system necessary to build the Project. Also, 94.9% of the land within the Site Boundary in Morrow County is devoted to farm use, and this percentage is not significantly different in other parts of the same general area. Thus, relocation of the Project to non-agricultural land is not feasible.

2. The Project will further important County and state policies. As discussed above in Section 2, both the MCZO and UCDO (and state law) expressly contemplate wind power generation facilities as a conditional use on EFU-zoned land, and both counties encourage renewable energy development on EFU land in their comprehensive plans. At the state level, ORS 215.213 and 215.283 both expressly allow wind energy facilities as conditional uses on EFU land. Also, the Oregon Renewable Energy Action Plan (Oregon Department of Energy, 2005) calls for significant, additional development of the state's renewable resources, including wind energy, and in 2007 Oregon adopted a Renewable Portfolio Standard for electricity requiring that 25 percent of Oregon's electric load come from new renewable energy by 2025. In addition, Statewide Land Use Planning Goal 13 calls for the development of renewable energy resources; the Legislature has enacted numerous tax credits and economic development incentives favoring renewable energy development; and Oregon has numerous other statutory programs together reflect a broad state policy to support renewable energy development. See, for example, ORS 757.612 (creating public purpose charge, a portion of the funds from which go to renewable energy); ORS 757.603(2) (requiring Oregon electric utilities to provide retail customers with at least one option including significant percentage of renewable energy).

   At the same time, the actual impact to agricultural practices is minimal. While (at worst) 146.27 acres of farmland in Morrow County will be taken out of production (and 170.64 acres for the entire Project), this represents only 1.4%

of the land devoted to farm use within the analysis area in Morrow County (and 1.4% for the entire Project). Also, those acres will not come out of production as a single parcel or even a few large parcels. Rather, the land will come out of production in half-acre to two-acre pieces distributed across many properties as turbines, access roads and transmission lines are built. Most linear facilities such as roads and transmission lines will be sited at the edges of fields or along existing road or transmission corridors, further reducing impacts to agricultural use. For the most part, the owners of the surrounding property will be able to continue agricultural use of the surrounding lands with minimal disruption or inconvenience. Thus, the positive advancement of numerous County and state goals and policies for increased renewable energy and use of the state's wind resources far outweighs the relatively minimal negative impact on agricultural uses and Goal 3.

3. The Project will advance County and state policies to promote efficient development and economic growth. The Project will encourage the efficient siting of land uses, and facilitate multiple uses of land. The Project will allow access to farmland and continued agricultural operations while simultaneously using the land for renewable energy generation. This is not a case of replacing one use with another. Instead, the Project adds an additional use and source of energy and economic benefit to already productive agricultural lands, with minimal adverse impact on the ongoing use of the land for agriculture. The end result is a significant net increase in economic output from the same land.

   The Project will also benefit the local economy through employment opportunities, and provide contributions to the local tax base. Facility construction is anticipated to take approximately 18 months per phase (assuming two construction phases). During construction, an estimated average workforce of 200 people will be employed, with a maximum of 475 people during the peak months of construction. Operation of the Project will require 8 to 12 full-time employees. These permanent jobs will contribute to the local economy. The Project also will result in an increase in annual property tax revenue to Morrow and Umatilla counties. The additional tax revenue generated by the existence of the Project will increase the counties' ability to provide roadways, police and fire protection, schools and other services to their citizens. Based on the state's experience with operating facilities in other counties, wind energy projects contribute significant annual property tax revenue to their host communities over the course of their operational lives (Renewable Northwest, 2004).

   Lastly, the Project injects additional dollars into the local economy in the form of permanent and temporary wages, demand for supplies and services, and additional revenue to local landowners, all to the net economic benefit of the

counties and the state. In sum, the net economic and growth benefits far outweigh the minimal negative impact to agricultural uses in the counties.

(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;

Response: Impacts in each of the four categories have been identified and adequately mitigated as follows:

Environmental. The Project's environmental impacts and corresponding mitigation are discussed in Exhibits J, L, P and Q. These exhibits identify potential environmental consequences of Project construction and operation, and demonstrate that the Project, with implementation of the proposed mitigation measures, will not cause any significant adverse environmental consequences.

Economic and Social. Exhibits R, S and T show that the Project will have no significant, unmitigated adverse impacts on scenic, cultural, historical, archaeological, or recreational resources. Exhibit U demonstrates that the Project will not have significant, unmitigated adverse impacts on community services such as housing, sewer, water supply, waste disposal, health care, education, and transportation. As discussed above in response to ORS 469.504(2)(c)(A), the Project will create jobs and contribute significant income to the local communities without significant reduction of land available for agricultural use. These benefits far outweigh the relatively small amount of agricultural activity that will be displaced by the Project.

Energy. The energy consequences of the Project will be positive by producing renewable, emissions-free energy, thereby reducing carbon emissions and our society's reliance on fossil fuels, and contributing to the battle against climate change.

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

Response: The Project is surrounded on all sides by rural, agricultural land which is used for growing crops, grazing and related agricultural uses, as well as existing wind energy facilities. As discussed above, the Project will have minimal impacts on the continued agricultural use of land both within the analysis area and surrounding it. Temporary impacts of construction will be mitigated as described elsewhere in this application. The Project is located far from any land uses that could reasonably suffer significant adverse impacts, such as residential areas. The adverse impacts of the Project on adjacent uses is minimal, and to the extent adverse impacts exist, they are all being mitigated to insignificant levels.

For the foregoing reasons, EFSC should take an exception to Goal 3 permitting permanent impacts to more than 12 acres of high-value farmland in Morrow County.

5.0 Conclusion

For the reasons set forth above, there is substantial evidence upon which EFSC can find that the Project meets the applicable land use standard for approval of a Site Certificate.

6.0 Submittal Requirements

Table K-3. Submittal Requirements Matrix	
Requirement	**Location**
OAR 3450-021-0010 (1)(k) Information about the proposed facility's compliance with the statewide planning goals adopted by the Land Conservation and Development Commission, providing evidence to support a finding by the Council as required by OAR 345-022-0030. The applicant shall state whether the applicant elects to address the Council's land use standard by obtaining local land use approvals under ORS 469.504(1)(a) or by obtaining a Council determination under ORS 469.504(1)(b). An applicant may elect different processes for an energy facility and a related or supporting facility but may not otherwise combine the two processes. Once the applicant has made an election, the applicant may not amend the application to make a different election. In this subsection, "affected local government" means a local government that has land use jurisdiction over any part of the proposed site of the facility. In the application, the applicant shall:	
(A) Include a map showing the comprehensive plan designations and land use zones in the analysis area.	Figure K-2
(B) If the applicant elects to obtain local land use approvals:	
(i) Identify the affected local government(s) from which land use approvals will be sought.	N/A
(ii) Describe the land use approvals required in order to satisfy the Council's land use standard.	N/A
(iii) Describe the status of the applicant's application for each land use approval.	N/A
(iv) Provide an estimate of time for issuance of local land use approvals.	N/A
(C) If the applicant elects to obtain a Council determination on land use:	
(i) Identify the affected local government(s).	Section 2.0
(ii) Identify the applicable substantive criteria from the affected local government's acknowledged comprehensive plan and land use regulations that are required by the statewide planning goals and that are in effect on the date the application is submitted and describe how the proposed facility complies with those criteria;	Sections 2.0, 4.0

Table K-3. Submittal Requirements Matrix	
Requirement	**Location**
(iii) Identify all Land Conservation and Development Commission administrative rules, statewide planning goals and land use statutes directly applicable to the facility under ORS 197.646(3) and describe how the proposed facility complies with those rules, goals and statutes.	Section 3.0
(iv) If the proposed facility might not comply with all applicable substantive criteria, identify the applicable statewide planning goals and describe how the proposed facility complies with those goals.	Section 4.0
(v) If the proposed facility might not comply with all applicable substantive criteria or applicable statewide planning goals, describe why an exception to any applicable statewide planning goal is justified, providing evidence to support all findings by the Council required under ORS 469.504(2).	Section 4.0
(D) If the proposed facility will be located on federal land:	N/A
(i) Identify the applicable land management plan adopted by the federal agency with jurisdiction over the federal land;	N/A
(ii) Explain any differences between state or local land use requirements and federal land management requirements.	N/A
(iii) Describe how the proposed facility complies with the applicable federal land management plan.	N/A
(iv) Describe any federal land use approvals required for the proposed facility and the status of application for each required federal land use approval.	N/A
(v) Provide an estimate of time for issuance of federal land use approvals.	N/A
(vi) If federal law or the land management plan conflicts with any applicable state or local land use requirements, explain the differences in the conflicting requirements, state whether the applicant requests Council waiver of the land use standard described under paragraph (B) or (C) of this subsection and explain the basis for a waiver.	N/A

Table K-4. Approval Standard	
Approval Standard	**Location**
OAR 345-022-0030 Land Use (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	N/A

Table K-4. Approval Standard	
Approval Standard	**Location**
(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);	Sections 2-4
(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	Section 4
(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).	N/A
(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.	N/A
(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;	N/A
(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	N/A
(c) The following standards are met:	
(A) Reasons justify why the state policy embodied in the applicable goal should not apply;	Section 4

Table K-4. Approval Standard	
Approval Standard	**Location**
(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	Section 4
(C) The proposed facility is compatible with other adjacent uses or will be made compatible through measures designed to reduce adverse impacts.	Section 4
(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.	N/A
(6) If the special advisory group recommends applicable substantive criteria for an energy facility described in ORS 469.300(10)(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(10)(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:	N/A
(a) The number of jurisdictions and zones in question;	N/A
(b) The degree to which the applicable substantive criteria reflect local government consideration of energy facilities in the planning process; and	N/A
(c) The level of consistence of the applicable substantive criteria from the various zones and jurisdictions.	N/A

Figures

Figure K-1

Wheatridge Wind Energy Facility

Analysis Area

Morrow and Umatilla Counties, OR
December 2014

- Site Boundary
- Analysis Area (1/2 mile Buffer of Site Boundary)
- County Boundary
- City/Town
- State Highway
- Local Road

Wheatridge West

Wheatridge East

Intraconnection Corridor

Umatilla County

Morrow County

Lexington

Immigrant Ln
Baker Ln
Little Juniper Ln
Strawberry Ln
Crum Road
BaseLine Rd
Wells Springs Rd
Bombing Range Rd
Ione-Boardman Rd
Barak Martin Rd N
Juniper Canyon Rd
Lexington Grange Rd
Kilkenny Rd
Kemp Ln
Beach Ln
Sand Hollow Rd
Myers Ln
Cutsforth Rd
Turner Ln
Dowen Rd
Nichols Rd
Piper Canyon Rd
Bell Canyon Loop
Blackhorse Canyon Ln
Clarks Canyon Rd
Spur Ln
Butter Creek Rd
Very Rd
Big Butter Creek Ln
Little Butter Creek Rd
207
74

1:140,000 WGS84 UTM 11

0 1 2 4 6 8 10 12 14 16 18 20 Miles

Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries, background imagery

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Figure K-2

Wheatridge Wind Energy Facility

Zoning

Morrow and Umatilla Counties, OR
December 2014

Wheatridge East
Wheatridge West
Intraconnection Corridor
Lexington
Umatilla County
Morrow County
Immigrant Ln
Baker Ln
Little Juniper Ln
Strawberry Ln
Wells Springs Rd
Ione-Boardman Rd
Bombing Range Rd
Bark Martin Rd N
Butter Creek Rd
Very Rd
Big Butter Creek Ln
Crum Road
Juniper Canyon Rd
Kilkenny Rd
Kemp Ln
Beach Ln
Sand Hollow Rd
Myers Ln
BaseLine Rd
Lexington Grange Rd
Cutsforth Rd
Turner Ln
Dowen Rd
Nichols Rd
Piper Canyon Rd
Bell Canyon Loop
Blackhorse Canyon Ln
Clarks Canyon Rd
Spur Ln
Little Butter Creek Rd
207
74

Site Boundary
Analysis Area (1/2 mile Buffer of Site Boundary)
County Boundary
State Highway
Local Road

Zoning *
- Commercial
- Exclusive Farm Use
- Farm Residential Zone
- Industrial Light
- Public
- Residential

*** The entirety of the Site Boundary is in land zoned as Exclusive Farm Use**

1:140,000 WGS84 UTM 11

0 1 2 4 6 8 10 12 14 16 18 20 Miles

Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries / Morrow County: zoning / Umatilla County: zoning

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Figure K-3

Wheatridge Wind Energy Facility

- Maximum Project Impact - GE 1.7-103 Project Facilities and Option 1 230kV Intraconnection Lines

Morrow and Umatilla Counties, OR
December 2014

Conceptual UEC or UEC/CB Longhorn Line

Wheatridge East

Wheatridge West

Conceptual UEC Stanfield Lines

Intraconnection Corridor

Umatilla County

Morrow County

Immigrant Ln
Baker Ln
Little Juniper Ln
Strawberry Ln
Wells Springs Rd
Bombing Range Rd
Ione-Boardman Rd
Garrak Marin Rd N
Juniper Canyon Rd
Crum Road
Kilkenny Rd
Kemp Ln
Beach Ln
Sand Hollow Rd
Myers Ln
BaseLine Rd
Lexington Grange Rd
Turner Ln
Nichols Rd
Piper Canyon Rd
Clarks Canyon Rd
Bell Canyon Loop
Blackhorse Canyon Ln
Dolliver Rd
Spur Ln
Butter Creek Rd
Big Butter Creek Ln
Little Butter Creek Rd
Vey Rd
207
74

Site Boundary
County Boundary
State Highway
Local Road
Proposed Strawberry Substation *

Conceptual UEC/CB Proposed Gen-tie Transmission Lines
- UEC or UEC/CB Longhorn *
- UEC Stanfield 1 **
- UEC Stanfield 2 **
- UEC line into Wheatridge East Substation **

Proposed Project Facilities
- Turbine
- Met Tower
- Intraconnection Lines (Option 1)
- Electrical Collector Line

Access Road
- New Road To Be Constructed
- Private Road To Be Improved
- O&M Facility
- Construction Yard

Substation
- Primary
- Alternate

* To be constructed and owned by the Umatilla Electric Cooperative or the Umatilla Electric Cooperative with the Columbia Basin Electric Cooperative
** To be constructed and owned by the Umatilla Electric Cooperative

1:135,000 WGS84 UTM 11

0 1 2 4 6 8 10 12 14 16 18 20 Miles

Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries, background imagery

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Figure K-4

Wheatridge Wind Energy Facility

- Minimum Project Impact -
GE 2.5-120 Project Facilities and Option 3 230kV Intraconnection Lines

Morrow and Umatilla Counties, OR
December 2014

Conceptual UEC or UEC/CB Longhorn Line

Wheatridge East

Wheatridge West

Conceptual UEC Stanfield Lines

Intraconnection Corridor

Umatilla County

Morrow County

Immigrant Ln
Baker Ln
Little Juniper Ln
Strawberry Ln
Wells Springs Rd
Bombing Range Rd
Ione-Boardman Rd
Gerrak Marin Rd N
Juniper Canyon Rd
Crum Road
Kilkenny Rd
Kemp Ln
Beach Ln
Sand Hollow Rd
Myers Ln
BaseLine Rd
Lexington Grange Rd
Turner Ln
Nichols Rd
Piper Canyon Rd
Clarks Canyon Rd
Bell Canyon Loop
Blackhorse Canyon Ln
Dolliver Rd
Spur Ln
Butter Creek Rd
Big Butter Creek Ln
Little Butter Creek Rd
Vey Rd
207
74

Site Boundary
County Boundary
State Highway
Local Road
Proposed Strawberry Substation *

Conceptual UEC/CB Proposed Gen-tie Transmission Lines
- UEC or UEC/CB Longhorn *
- UEC Stanfield 1 **
- UEC Stanfield 2 **
- UEC line into Wheatridge East Substation **

Proposed Project Facilities
- Turbine
- Met Tower
- Intraconnection Lines (Option 3)
- Electrical Collector Line

Access Road
- New Road To Be Constructed
- Private Road To Be Improved
- O&M Facility
- Construction Yard

Substation
- Primary
- Alternate

* To be constructed and owned by the Umatilla Electric Cooperative or the Umatilla Electric Cooperative with the Columbia Basin Electric Cooperative
** To be constructed and owned by the Umatilla Electric Cooperative

1:135,000 WGS84 UTM 11

0 1 2 4 6 8 10 12 14 16 18 20 Miles

Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries, background imagery

TETRA TECH

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Figure K-5.1

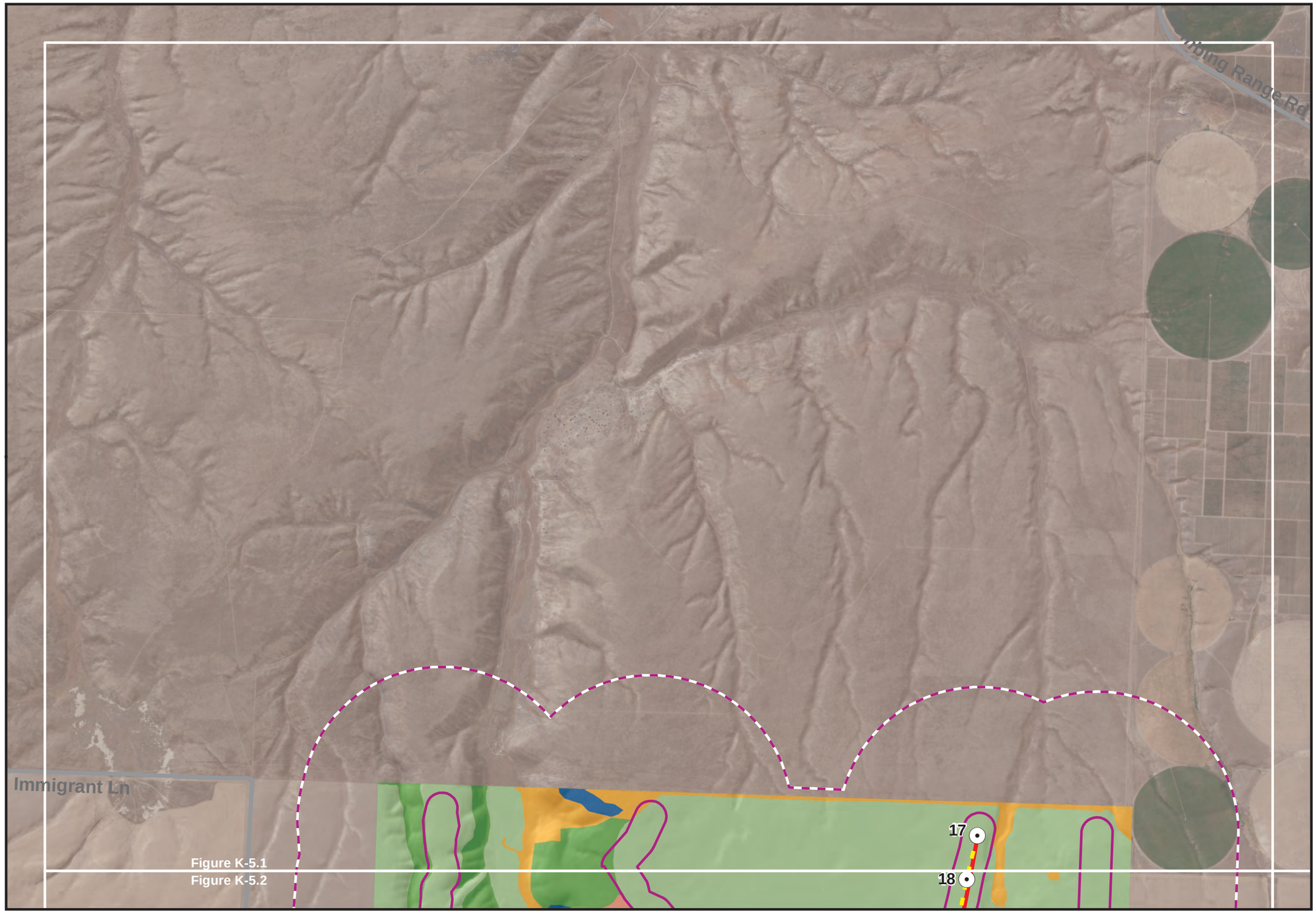
Wheatridge Wind Energy Facility

Land Use

- Maximum Project Impact - GE 1.7-103 Project Facilities and Option 1 230kV Intraconnection Lines

Details Map

Morrow and Umatilla Counties, OR
April 2015



- Site Boundary
- Analysis Area (1/2 mile Buffer of Site Boundary)
- County Boundary
- Map Grid
- State Highway
- Local Road
- Proposed Strawberry Substation *

Proposed Project Facilities

- Turbine
- Met Tower
- Intraconnection Lines (Option 1)
- Electrical Collector Line

Access Road

- New Road To Be Constructed
- Private Road To Be Improved
- O&M Facility
- Construction Yard

Substation

- Primary
- Alternate

Land Use

- Developed-Dryland Wheat
- Developed-Irrigated Agriculture
- Developed-Other
- Developed-Revegetated or Other Planted Grassland
- Grassland-Exotic Annual
- Grassland-Native Perennial
- Riparian-Trees
- Shrub-steppe-Basin Big Sagebrush
- Shrub-steppe-Rabbitbrush/Snakeweed
- High Value Farmland

1:24,000 1 inch = 2,000 feet WGS84 UTM 11

0 0.25 0.5 1 1.5 2 Miles

Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries / Northwest Wildlife Consultants: land use / Tetra Tech: high value farmland

* To be constructed and owned by the Umatilla Electric Cooperative or the Umatilla Electric Cooperative with the Columbia Basin Electric Cooperative

TETRA TECH

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Figure K-5.1
Figure K-5.2

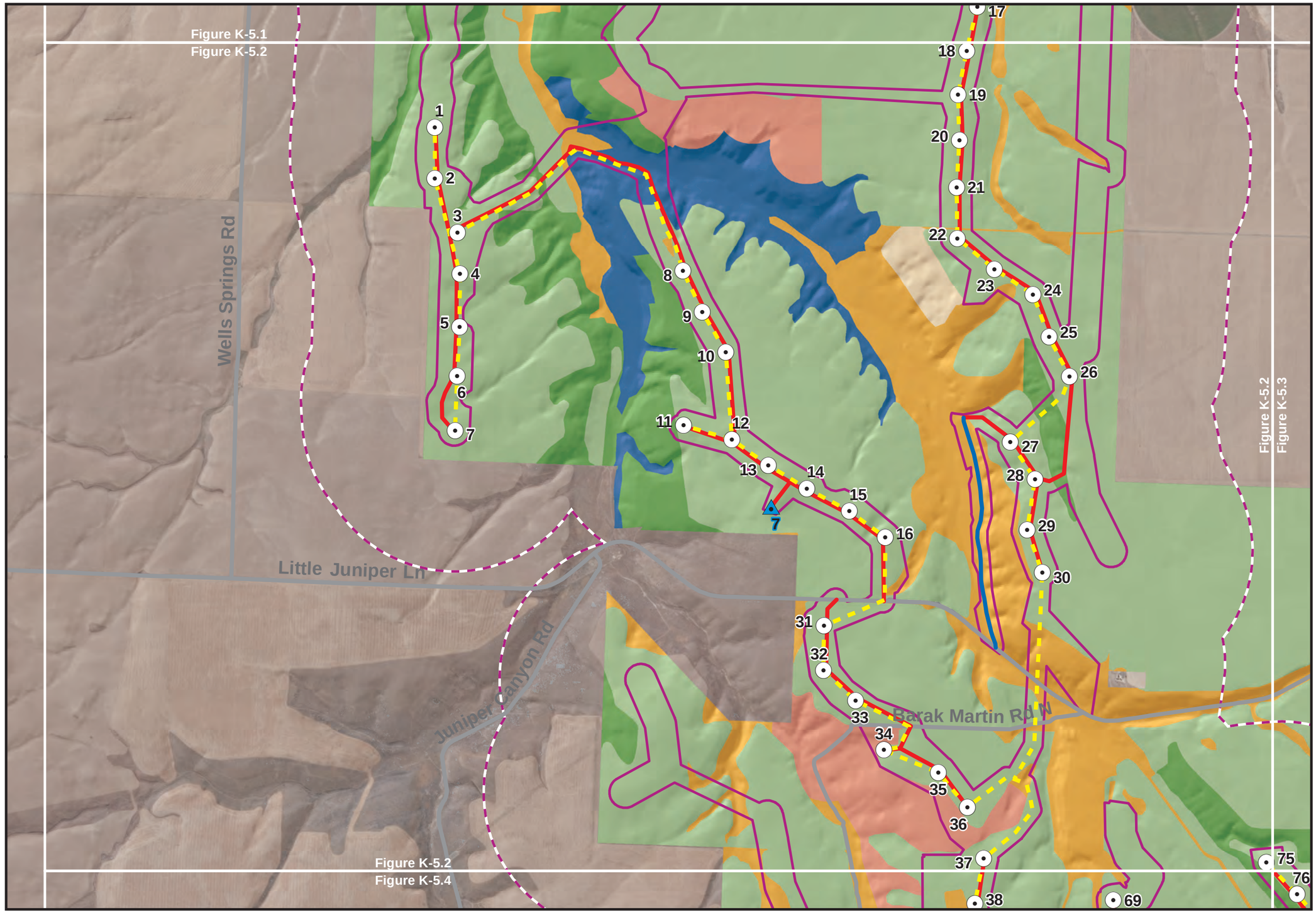

Figure K-5.2
Figure K-5.3

Figure K-5.2
Figure K-5.4

1:24,000 1 inch = 2,000 feet WGS84 UTM 11

0 0.25 0.5 1 1.5 2 Miles

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Figure K-5.2

Wheatridge Wind Energy Facility

Land Use

- Maximum Project Impact - GE 1.7-103 Project Facilities and Option 1 230kV Intraconnection Lines

Details Map

Morrow and Umatilla Counties, OR
April 2015

- Site Boundary
- Analysis Area (1/2 mile Buffer of Site Boundary)
- County Boundary
- Map Grid
- State Highway
- Local Road
- Proposed Strawberry Substation *

Proposed Project Facilities

- Turbine
- Met Tower
- Intraconnection Lines (Option 1)
- Electrical Collector Line

Access Road

- New Road To Be Constructed
- Private Road To Be Improved
- O&M Facility
- Construction Yard

Substation

- Primary
- Alternate

Land Use

- Developed-Dryland Wheat
- Developed-Irrigated Agriculture
- Developed-Other
- Developed-Revegetated or Other Planted Grassland
- Grassland-Exotic Annual
- Grassland-Native Perennial
- Riparian-Trees
- Shrub-steppe-Basin Big Sagebrush
- Shrub-steppe-Rabbitbrush/Snakeweed
- High Value Farmland

TETRA TECH

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Figure K-5.3

Wheatridge Wind Energy Facility

Land Use

- Maximum Project Impact - GE 1.7-103 Project Facilities and Option 1 230kV Intraconnection Lines

Details Map

Morrow and Umatilla Counties, OR
April 2015

- Site Boundary
- Analysis Area (1/2 mile Buffer of Site Boundary)
- County Boundary
- Map Grid
- State Highway
- Local Road
- Proposed Strawberry Substation *

Proposed Project Facilities

- Turbine
- Met Tower
- Intraconnection Lines (Option 1)
- Electrical Collector Line

Access Road

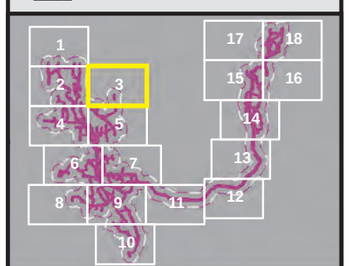
- New Road To Be Constructed
- Private Road To Be Improved
- O&M Facility
- Construction Yard

Substation

- Primary
- Alternate

Land Use

- Developed-Dryland Wheat
- Developed-Irrigated Agriculture
- Developed-Other
- Developed-Revegetated or Other Planted Grassland
- Grassland-Exotic Annual
- Grassland-Native Perennial
- Riparian-Trees
- Shrub-steppe-Basin Big Sagebrush
- Shrub-steppe-Rabbitbrush/Snakeweed
- High Value Farmland



TETRA TECH

1:24,000 1 inch = 2,000 feet WGS84 UTM 11

0 0.25 0.5 1 1.5 2 Miles

Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries / Northwest Wildlife Consultants: land use / Tetra Tech: high value farmland

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Figure K-5.2
Figure K-5.4

Strawberry Ln

Barak Martin Rd N

207

Figure K-5.4
Figure K-5.5

Proposed Strawberry Substation

1 2a 6 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76

Figure K-5.4

Wheatridge Wind Energy Facility

Land Use

- Maximum Project Impact - GE 1.7-103 Project Facilities and Option 1 230kV Intraconnection Lines

Details Map

Morrow and Umatilla Counties, OR
April 2015

- Site Boundary
- Analysis Area (1/2 mile Buffer of Site Boundary)
- County Boundary
- Map Grid
- State Highway
- Local Road
- Proposed Strawberry Substation *

Proposed Project Facilities

- Turbine
- Met Tower
- Intraconnection Lines (Option 1)
- Electrical Collector Line

Access Road

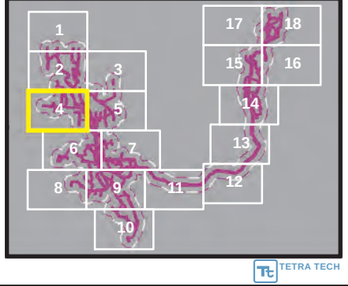
- New Road To Be Constructed
- Private Road To Be Improved
- O&M Facility
- Construction Yard

Substation

- Primary
- Alternate

Land Use

- Developed-Dryland Wheat
- Developed-Irrigated Agriculture
- Developed-Other
- Developed-Revegetated or Other Planted Grassland
- Grassland-Exotic Annual
- Grassland-Native Perennial
- Riparian-Trees
- Shrub-steppe-Basin Big Sagebrush
- Shrub-steppe-Rabbitbrush/Snakeweed
- High Value Farmland



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TETRA TECH

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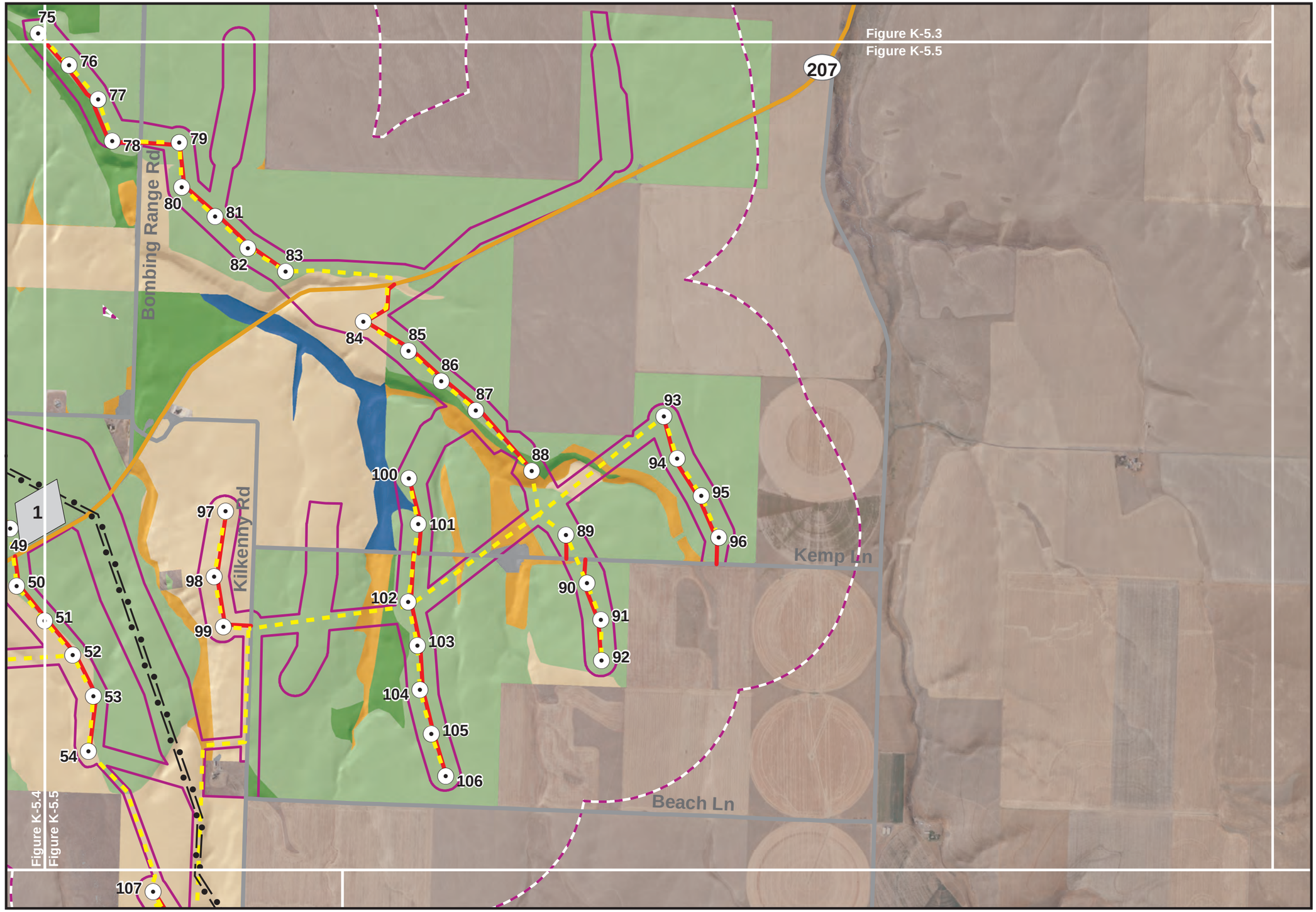


Figure K-5.5

Wheatridge Wind Energy Facility

Land Use

- Maximum Project Impact - GE 1.7-103 Project Facilities and Option 1 230kV Intraconnection Lines

Details Map

Morrow and Umatilla Counties, OR
April 2015

- Site Boundary
- Analysis Area (1/2 mile Buffer of Site Boundary)
- County Boundary
- Map Grid
- State Highway
- Local Road
- Proposed Strawberry Substation *

Proposed Project Facilities

- Turbine
- Met Tower
- Intraconnection Lines (Option 1)
- Electrical Collector Line

Access Road

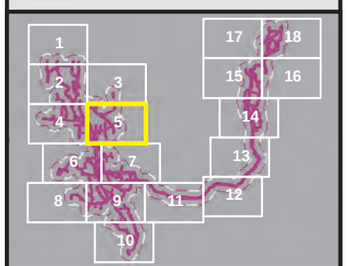
- New Road To Be Constructed
- Private Road To Be Improved
- O&M Facility
- Construction Yard

Substation

- Primary
- Alternate

Land Use

- Developed-Dryland Wheat
- Developed-Irrigated Agriculture
- Developed-Other
- Developed-Revegetated or Other Planted Grassland
- Grassland-Exotic Annual
- Grassland-Native Perennial
- Riparian-Trees
- Shrub-steppe-Basin Big Sagebrush
- Shrub-steppe-Rabbitbrush/Snakeweed
- High Value Farmland



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Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries / Northwest Wildlife Consultants: land use / Tetra Tech: high value farmland

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TETRA TECH

Figure K-5.6

Wheatridge Wind Energy Facility

Land Use

- Maximum Project Impact - GE 1.7-103 Project Facilities and Option 1 230kV Intraconnection Lines

Details Map

Morrow and Umatilla Counties, OR
April 2015

Juniper Canyon Rd
Baseline Rd
Lexington Grange Rd
Turner Ln
Nichols Rd
Cutsforth Rd
Kilkenny Rd
Figure K-5.6
Figure K-5.7
207

1:24,000 1 inch = 2,000 feet WGS84 UTM 11

0 0.25 0.5 1 1.5 2 Miles

Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries / Northwest Wildlife Consultants: land use / Tetra Tech: high value farmland

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- Site Boundary
- Analysis Area (1/2 mile Buffer of Site Boundary)
- County Boundary
- Map Grid
- State Highway
- Local Road
- Proposed Strawberry Substation *

Proposed Project Facilities

- Turbine
- Met Tower
- Intraconnection Lines (Option 1)
- Electrical Collector Line

Access Road

- New Road To Be Constructed
- Private Road To Be Improved
- O&M Facility
- Construction Yard

Substation

- Primary
- Alternate

Land Use

- Developed-Dryland Wheat
- Developed-Irrigated Agriculture
- Developed-Other
- Developed-Revegetated or Other Planted Grassland
- Grassland-Exotic Annual
- Grassland-Native Perennial
- Riparian-Trees
- Shrub-steppe-Basin Big Sagebrush
- Shrub-steppe-Rabbitbrush/Snakeweed
- High Value Farmland

TETRA TECH

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Figure K-5.7

Wheatridge Wind Energy Facility

Land Use

- Maximum Project Impact - GE 1.7-103 Project Facilities and Option 1 230kV Intraconnection Lines

Details Map

Morrow and Umatilla Counties, OR
April 2015

Figure K-5.6
Figure K-5.7

110
111
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Myers Ln
BaseLine Rd
Cutsforth Rd
Dowell Rd
Sand Hollow Rd
Spur Lp

- Site Boundary
- Analysis Area (1/2 mile Buffer of Site Boundary)
- County Boundary
- Map Grid
- State Highway
- Local Road
- Proposed Strawberry Substation *

Proposed Project Facilities

- Turbine
- Met Tower
- Intraconnection Lines (Option 1)
- Electrical Collector Line

Access Road

- New Road To Be Constructed
- Private Road To Be Improved
- O&M Facility
- Construction Yard

Substation

- Primary
- Alternate

Land Use

- Developed-Dryland Wheat
- Developed-Irrigated Agriculture
- Developed-Other
- Developed-Revegetated or Other Planted Grassland
- Grassland-Exotic Annual
- Grassland-Native Perennial
- Riparian-Trees
- Shrub-steppe-Basin Big Sagebrush
- Shrub-steppe-Rabbitbrush/Snakeweed
- High Value Farmland

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TETRA TECH

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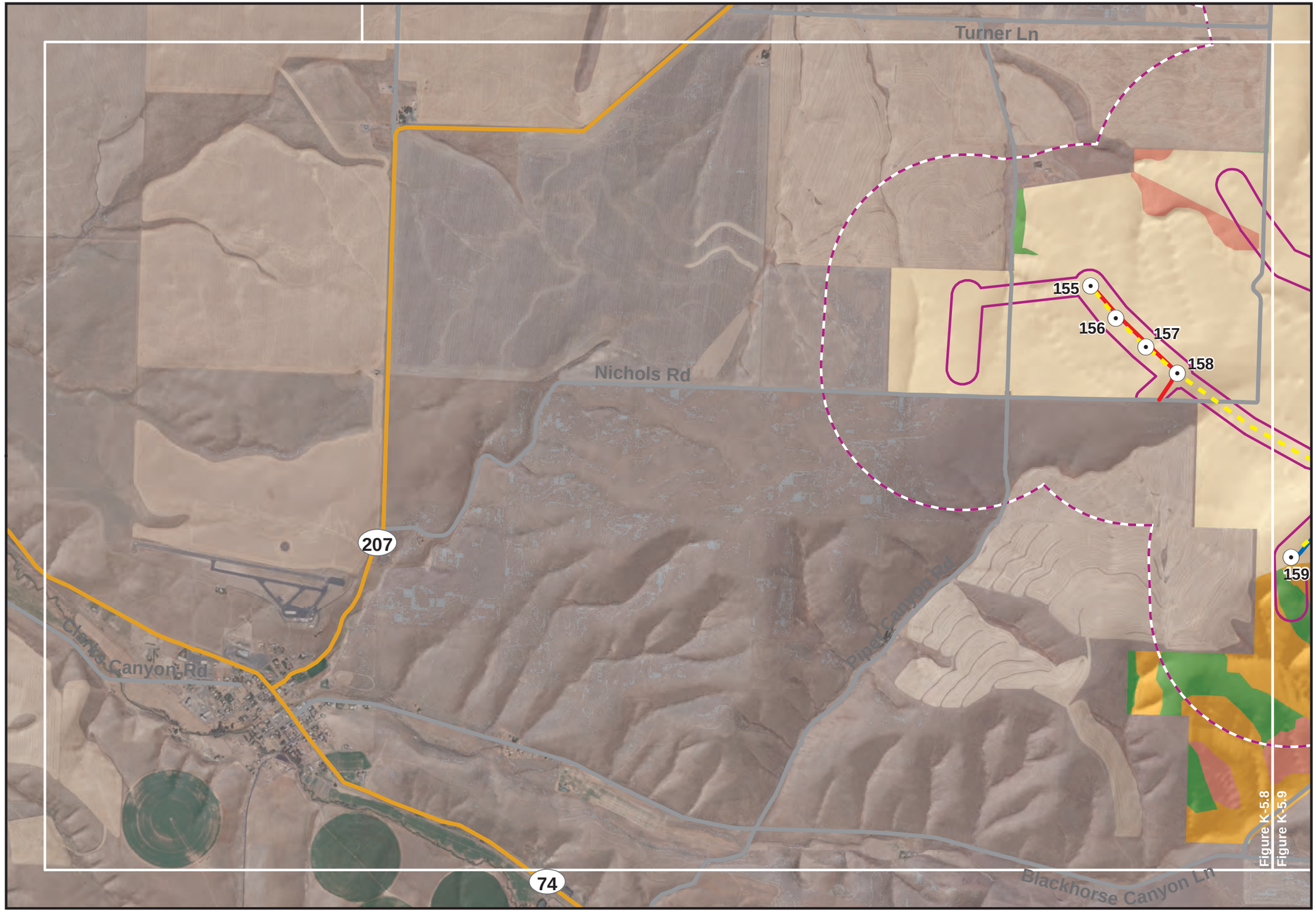

Figure K-5.8

Wheatridge Wind Energy Facility

Land Use

- Maximum Project Impact - GE 1.7-103 Project Facilities and Option 1 230kV Intraconnection Lines

Details Map

Morrow and Umatilla Counties, OR
April 2015

- Site Boundary
- Analysis Area (1/2 mile Buffer of Site Boundary)
- County Boundary
- Map Grid
- State Highway
- Local Road
- Proposed Strawberry Substation *

Proposed Project Facilities

- Turbine
- Met Tower
- Intraconnection Lines (Option 1)
- Electrical Collector Line

Access Road

- New Road To Be Constructed
- Private Road To Be Improved
- O&M Facility
- Construction Yard

Substation

- Primary
- Alternate

Land Use

- Developed-Dryland Wheat
- Developed-Irrigated Agriculture
- Developed-Other
- Developed-Revegetated or Other Planted Grassland
- Grassland-Exotic Annual
- Grassland-Native Perennial
- Riparian-Trees
- Shrub-steppe-Basin Big Sagebrush
- Shrub-steppe-Rabbitbrush/Snakeweed
- High Value Farmland

TETRA TECH

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Figure K-5.9

Wheatridge Wind Energy Facility

Land Use

- Maximum Project Impact - GE 1.7-103 Project Facilities and Option 1 230kV Intraconnection Lines

Details Map

Morrow and Umatilla Counties, OR
April 2015

Nichols Rd
Dowell Rd
Sand Hollow Rd
Bell Canyon Loop
Blackhorse Canyon Ln
Figure K-5.8
Figure K-5.9
Figure K-5.11

- Site Boundary
- Analysis Area (1/2 mile Buffer of Site Boundary)
- County Boundary
- Map Grid
- State Highway
- Local Road
- Proposed Strawberry Substation *

Proposed Project Facilities

- Turbine
- Met Tower
- Intraconnection Lines (Option 1)
- Electrical Collector Line

Access Road

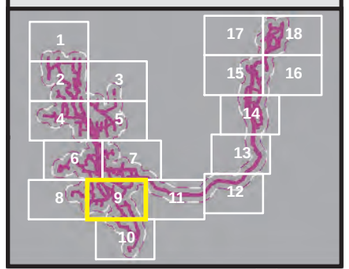
- New Road To Be Constructed
- Private Road To Be Improved
- O&M Facility
- Construction Yard

Substation

- Primary
- Alternate

Land Use

- Developed-Dryland Wheat
- Developed-Irrigated Agriculture
- Developed-Other
- Developed-Revegetated or Other Planted Grassland
- Grassland-Exotic Annual
- Grassland-Native Perennial
- Riparian-Trees
- Shrub-steppe-Basin Big Sagebrush
- Shrub-steppe-Rabbitbrush/Snakeweed
- High Value Farmland



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TETRA TECH

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Figure K-5.10

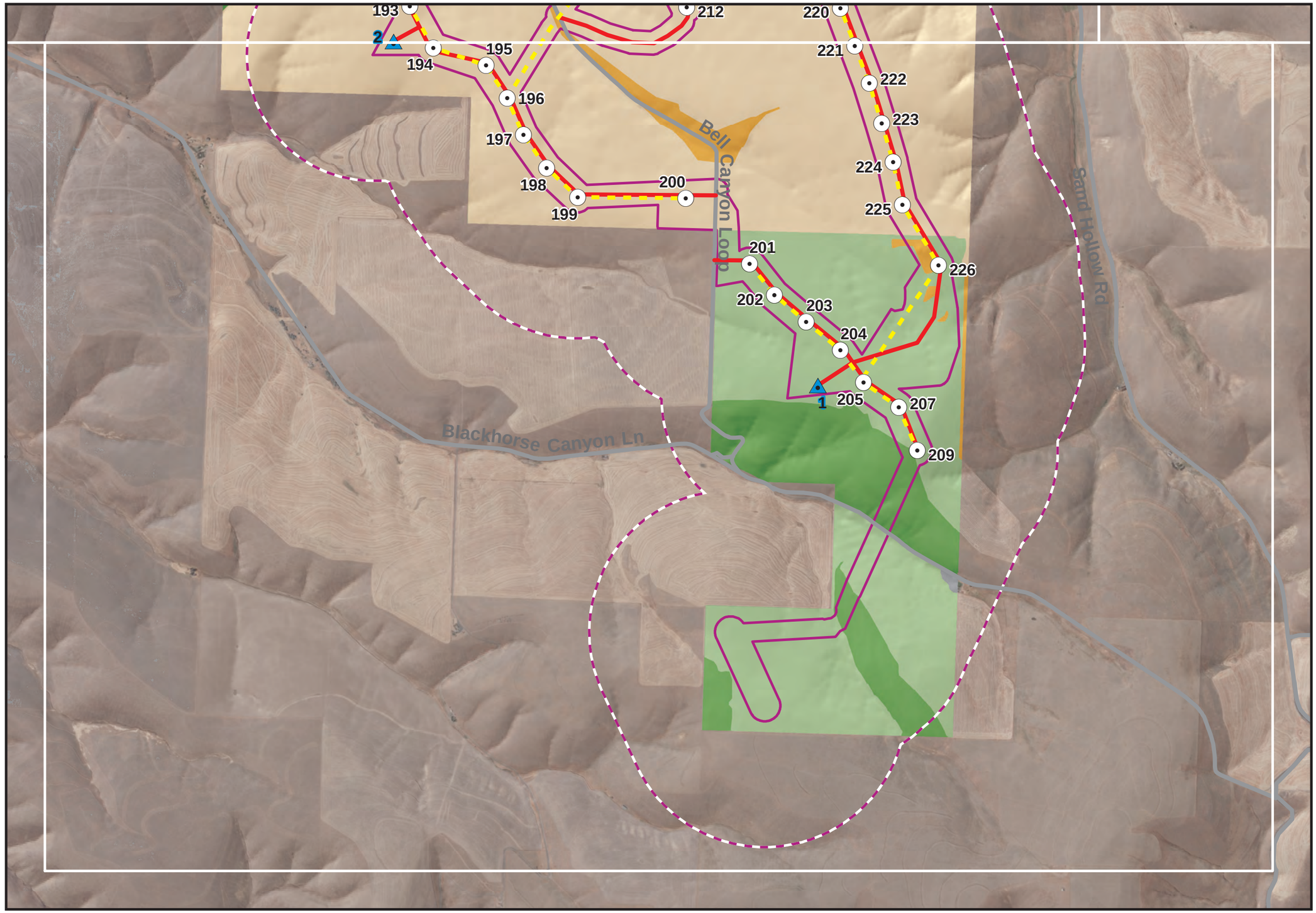
Wheatridge Wind Energy Facility

Land Use

- Maximum Project Impact - GE 1.7-103 Project Facilities and Option 1 230kV Intraconnection Lines

Details Map

Morrow and Umatilla Counties, OR
April 2015



- Site Boundary
- Analysis Area (1/2 mile Buffer of Site Boundary)
- County Boundary
- Map Grid
- State Highway
- Local Road
- Proposed Strawberry Substation *

Proposed Project Facilities

- Turbine
- Met Tower
- Intraconnection Lines (Option 1)
- Electrical Collector Line

Access Road

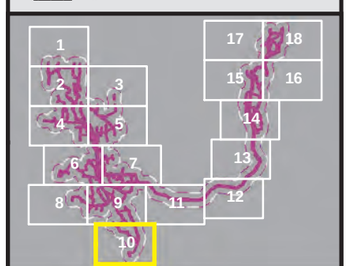
- New Road To Be Constructed
- Private Road To Be Improved
- O&M Facility
- Construction Yard

Substation

- Primary
- Alternate

Land Use

- Developed-Dryland Wheat
- Developed-Irrigated Agriculture
- Developed-Other
- Developed-Revegetated or Other Planted Grassland
- Grassland-Exotic Annual
- Grassland-Native Perennial
- Riparian-Trees
- Shrub-steppe-Basin Big Sagebrush
- Shrub-steppe-Rabbitbrush/Snakeweed
- High Value Farmland



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TETRA TECH

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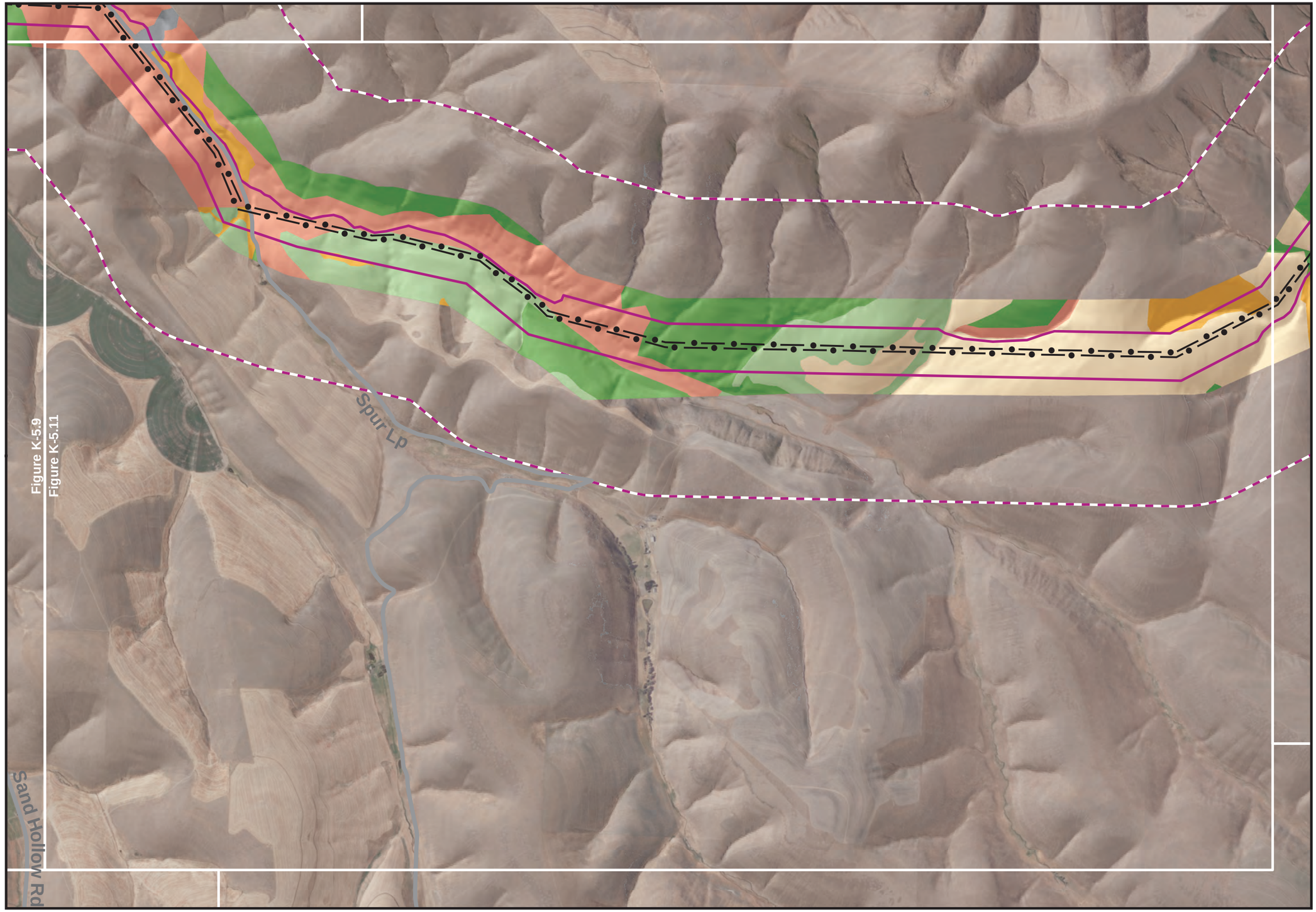

Figure K-5.11

Wheatridge Wind Energy Facility

Land Use

- Maximum Project Impact - GE 1.7-103 Project Facilities and Option 1 230kV Intraconnection Lines

Details Map

Morrow and Umatilla Counties, OR
April 2015

- Site Boundary
- Analysis Area (1/2 mile Buffer of Site Boundary)
- County Boundary
- Map Grid
- State Highway
- Local Road
- Proposed Strawberry Substation *

Proposed Project Facilities

- Turbine
- Met Tower
- Intraconnection Lines (Option 1)
- Electrical Collector Line

Access Road

- New Road To Be Constructed
- Private Road To Be Improved
- O&M Facility
- Construction Yard

Substation

- Primary
- Alternate

Land Use

- Developed-Dryland Wheat
- Developed-Irrigated Agriculture
- Developed-Other
- Developed-Revegetated or Other Planted Grassland
- Grassland-Exotic Annual
- Grassland-Native Perennial
- Riparian-Trees
- Shrub-steppe-Basin Big Sagebrush
- Shrub-steppe-Rabbitbrush/Snakeweed
- High Value Farmland

TETRA TECH

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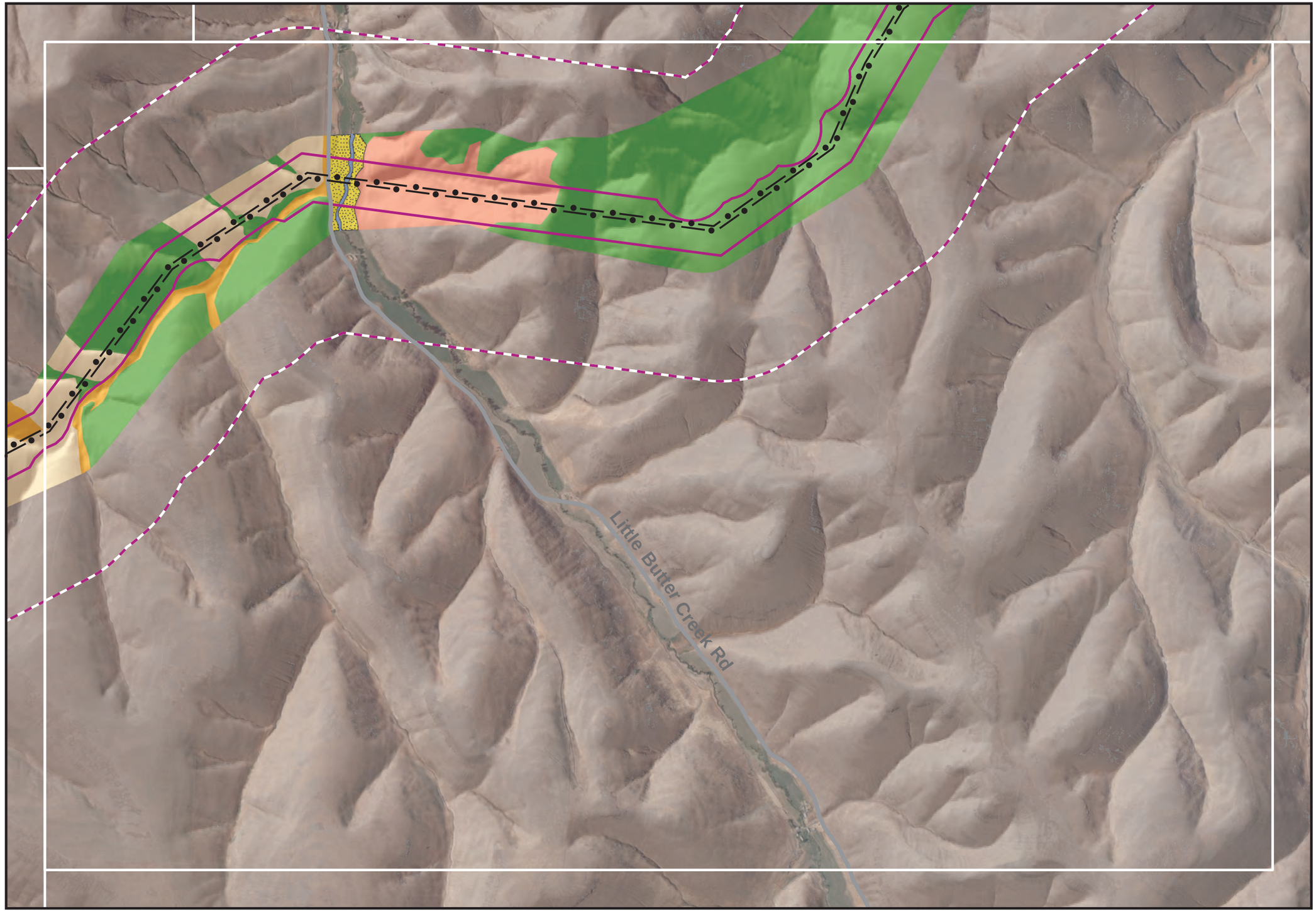

Figure K-5.12

Wheatridge Wind Energy Facility

Land Use

- Maximum Project Impact - GE 1.7-103 Project Facilities and Option 1 230kV Intraconnection Lines

Details Map

Morrow and Umatilla Counties, OR
April 2015

- Site Boundary
- Analysis Area (1/2 mile Buffer of Site Boundary)
- County Boundary
- Map Grid
- State Highway
- Local Road
- Proposed Strawberry Substation *

Proposed Project Facilities

- Turbine
- Met Tower
- Intraconnection Lines (Option 1)
- Electrical Collector Line

Access Road

- New Road To Be Constructed
- Private Road To Be Improved
- O&M Facility
- Construction Yard

Substation

- Primary
- Alternate

Land Use

- Developed-Dryland Wheat
- Developed-Irrigated Agriculture
- Developed-Other
- Developed-Revegetated or Other Planted Grassland
- Grassland-Exotic Annual
- Grassland-Native Perennial
- Riparian-Trees
- Shrub-steppe-Basin Big Sagebrush
- Shrub-steppe-Rabbitbrush/Snakeweed
- High Value Farmland

TETRA TECH

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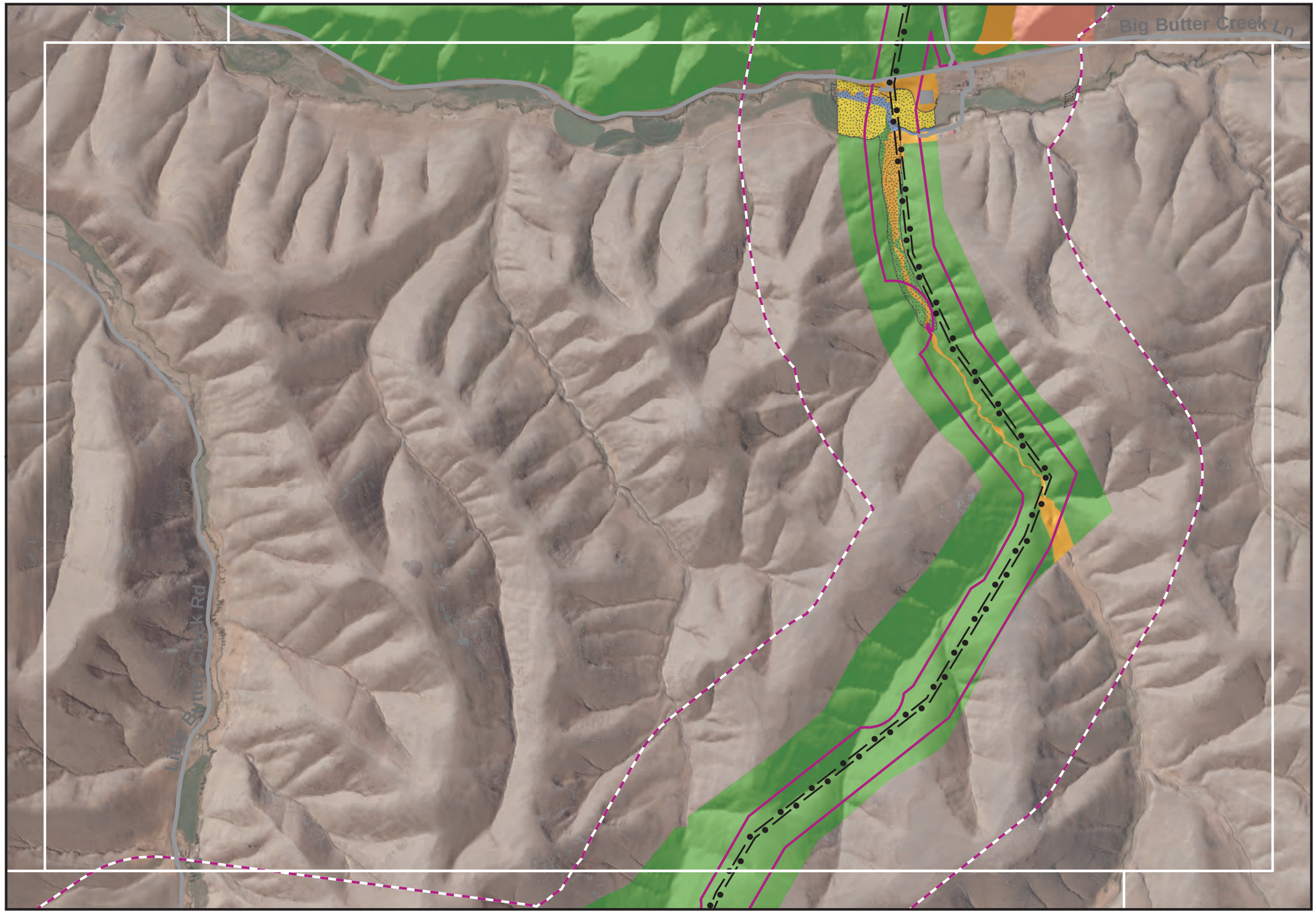


Figure K-5.13

Wheatridge Wind Energy Facility

Land Use

- Maximum Project Impact - GE 1.7-103 Project Facilities and Option 1 230kV Intraconnection Lines

Details Map

Morrow and Umatilla Counties, OR
April 2015

- Site Boundary
- Analysis Area (1/2 mile Buffer of Site Boundary)
- County Boundary
- Map Grid
- State Highway
- Local Road
- Proposed Strawberry Substation *

Proposed Project Facilities

- Turbine
- Met Tower
- Intraconnection Lines (Option 1)
- Electrical Collector Line

Access Road

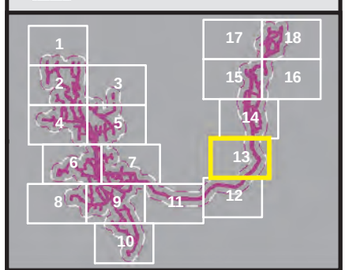
- New Road To Be Constructed
- Private Road To Be Improved
- O&M Facility
- Construction Yard

Substation

- Primary
- Alternate

Land Use

- Developed-Dryland Wheat
- Developed-Irrigated Agriculture
- Developed-Other
- Developed-Revegetated or Other Planted Grassland
- Grassland-Exotic Annual
- Grassland-Native Perennial
- Riparian-Trees
- Shrub-steppe-Basin Big Sagebrush
- Shrub-steppe-Rabbitbrush/Snakeweed
- High Value Farmland



TETRA TECH

1:24,000 1 inch = 2,000 feet WGS84 UTM 11

0 0.25 0.5 1 1.5 2 Miles

Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries / Northwest Wildlife Consultants: land use / Tetra Tech: high value farmland

* To be constructed and owned by the Umatilla Electric Cooperative or the Umatilla Electric Cooperative with the Columbia Basin Electric Cooperative

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Figure K-5.14

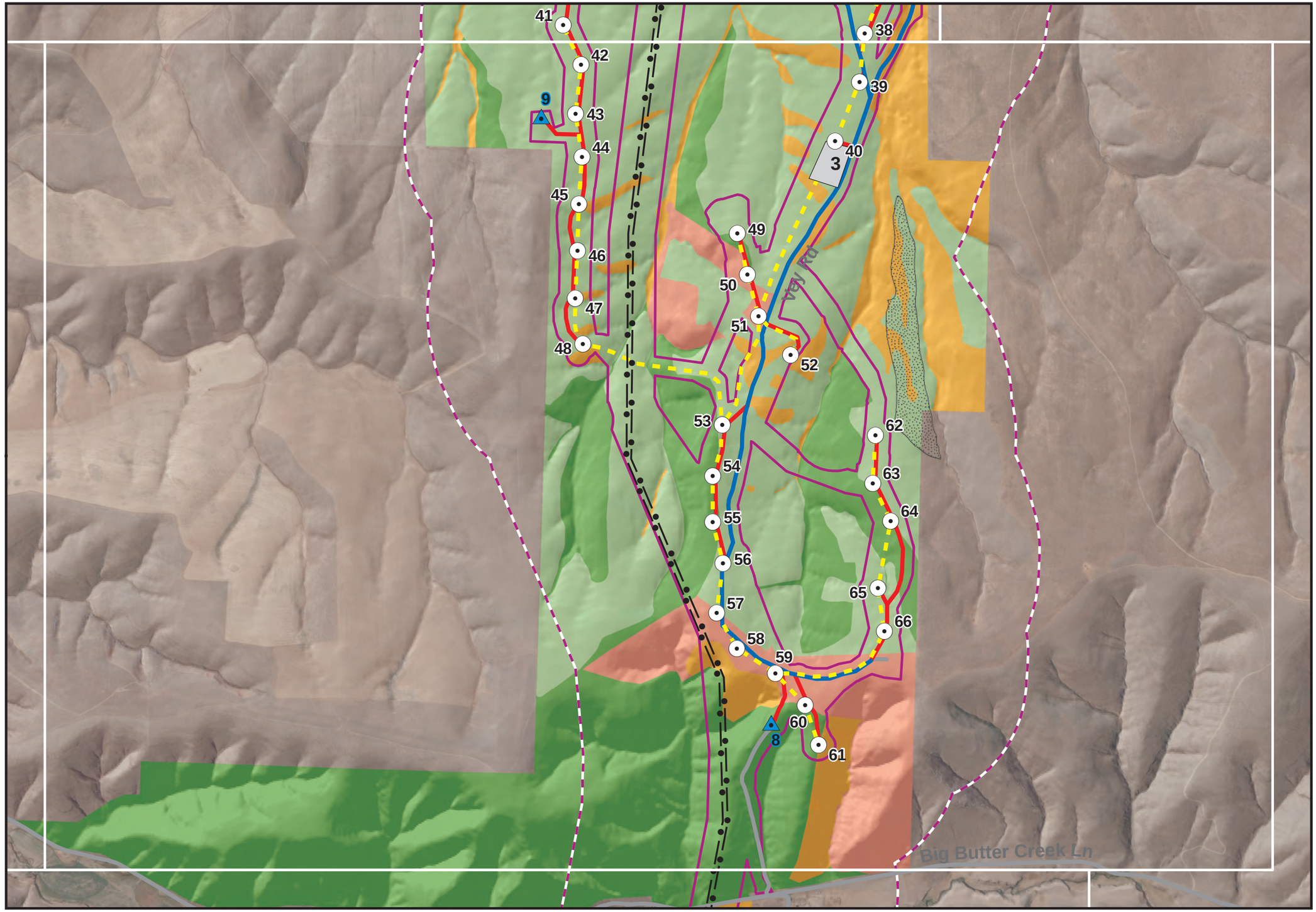
Wheatridge Wind Energy Facility

Land Use

- Maximum Project Impact - GE 1.7-103 Project Facilities and Option 1 230kV Intraconnection Lines

Details Map

Morrow and Umatilla Counties, OR
April 2015



Site Boundary
Analysis Area (1/2 mile Buffer of Site Boundary)
County Boundary
Map Grid
State Highway
Local Road
Proposed Strawberry Substation *

Proposed Project Facilities

Turbine
Met Tower
Intraconnection Lines (Option 1)
Electrical Collector Line

Access Road

New Road To Be Constructed
Private Road To Be Improved
O&M Facility
Construction Yard

Substation

Primary
Alternate

Land Use

Developed-Dryland Wheat
Developed-Irrigated Agriculture
Developed-Other
Developed-Revegetated or Other Planted Grassland
Grassland-Exotic Annual
Grassland-Native Perennial
Riparian-Trees
Shrub-steppe-Basin Big Sagebrush
Shrub-steppe-Rabbitbrush/Snakeweed
High Value Farmland

1:24,000 1 inch = 2,000 feet WGS84 UTM 11

0 0.25 0.5 1 1.5 2 Miles

Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries / Northwest Wildlife Consultants: land use / Tetra Tech: high value farmland

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207

Figure K-5.17
Figure K-5.15

Umatilla County
Morrow County

Figure K-5.15
Figure K-5.16

Figure K-5.15

Wheatridge Wind Energy Facility

Land Use

- Maximum Project Impact - GE 1.7-103 Project Facilities and Option 1 230kV Intraconnection Lines

Details Map

Morrow and Umatilla Counties, OR
April 2015

- Site Boundary
- Analysis Area (1/2 mile Buffer of Site Boundary)
- County Boundary
- Map Grid
- State Highway
- Local Road
- Proposed Strawberry Substation *

Proposed Project Facilities

- Turbine
- Met Tower
- Intraconnection Lines (Option 1)
- Electrical Collector Line

Access Road

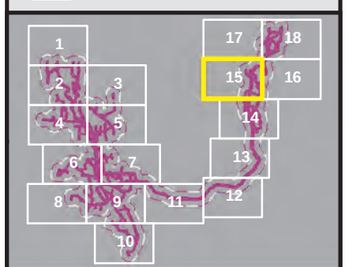
- New Road To Be Constructed
- Private Road To Be Improved
- O&M Facility
- Construction Yard

Substation

- Primary
- Alternate

Land Use

- Developed-Dryland Wheat
- Developed-Irrigated Agriculture
- Developed-Other
- Developed-Revegetated or Other Planted Grassland
- Grassland-Exotic Annual
- Grassland-Native Perennial
- Riparian-Trees
- Shrub-steppe-Basin Big Sagebrush
- Shrub-steppe-Rabbitbrush/Snakeweed
- High Value Farmland



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0 0.25 0.5 1 1.5 2 Miles

Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries / Northwest Wildlife Consultants: land use / Tetra Tech: high value farmland

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TETRA TECH

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Figure K-5.18
Figure K-5.16

15
16
17
18
19
20
21
11
22

Vey Rd

Umatilla County
Morrow County

Figure K-5.15
Figure K-5.16

Figure K-5.16

Wheatridge Wind Energy Facility

Land Use

- Maximum Project Impact -
GE 1.7-103 Project Facilities and Option 1 230kV Intraconnection Lines

Details Map

Morrow and Umatilla Counties, OR
April 2015

- Site Boundary
- Analysis Area (1/2 mile Buffer of Site Boundary)
- County Boundary
- Map Grid
- State Highway
- Local Road
- Proposed Strawberry Substation *

Proposed Project Facilities

- Turbine
- Met Tower
- Intraconnection Lines (Option 1)
- Electrical Collector Line

Access Road

- New Road To Be Constructed
- Private Road To Be Improved
- O&M Facility
- Construction Yard

Substation

- Primary
- Alternate

Land Use

- Developed-Dryland Wheat
- Developed-Irrigated Agriculture
- Developed-Other
- Developed-Revegetated or Other Planted Grassland
- Grassland-Exotic Annual
- Grassland-Native Perennial
- Riparian-Trees
- Shrub-steppe-Basin Big Sagebrush
- Shrub-steppe-Rabbitbrush/Snakeweed
- High Value Farmland

TETRA TECH

1:24,000 1 inch = 2,000 feet WGS84 UTM 11

0 0.25 0.5 1 1.5 2 Miles

Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries / Northwest Wildlife Consultants: land use / Tetra Tech: high value farmland

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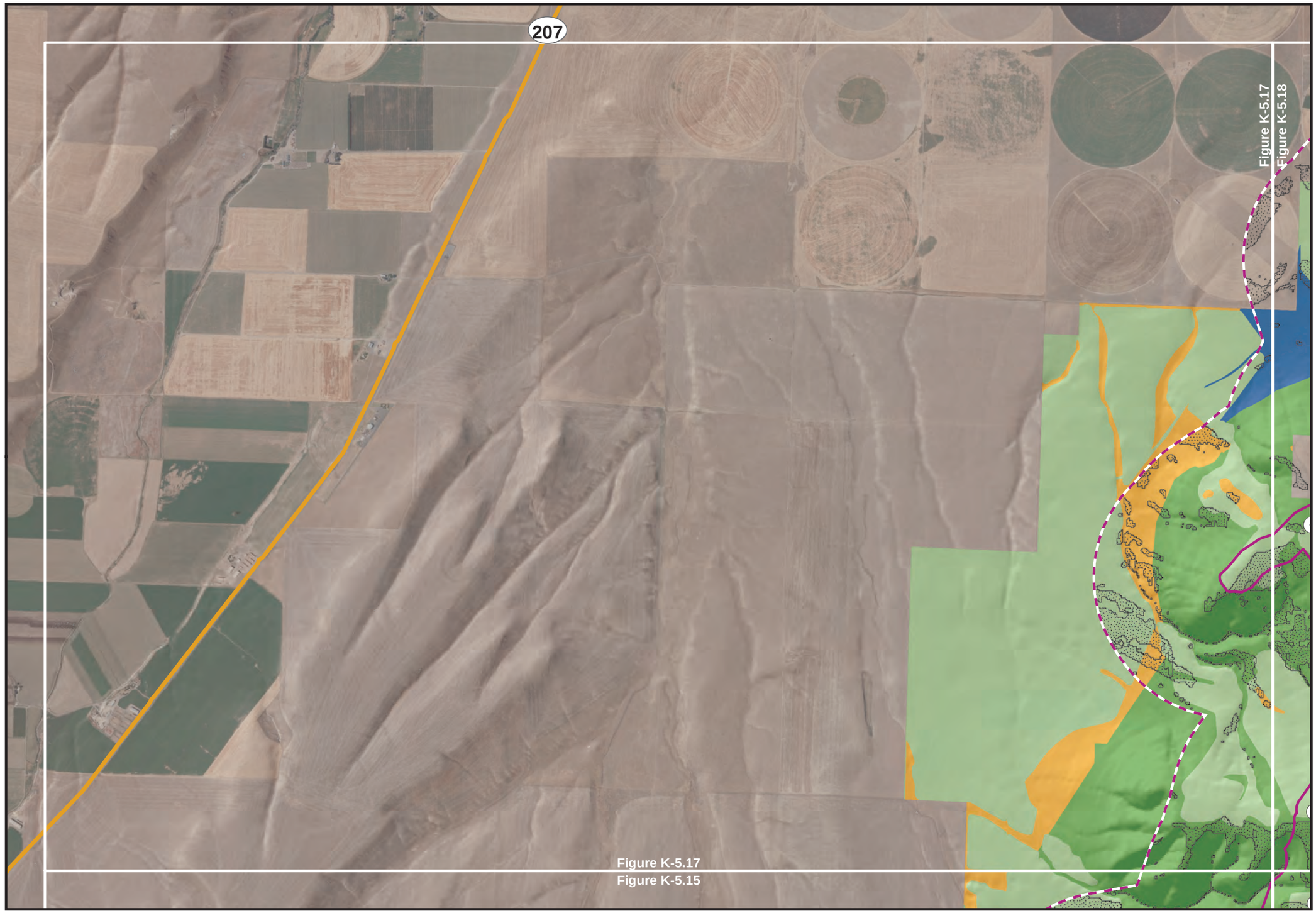

Figure K-5.17

Wheatridge Wind Energy Facility

Land Use

- Maximum Project Impact - GE 1.7-103 Project Facilities and Option 1 230kV Intraconnection Lines

Details Map

Morrow and Umatilla Counties, OR
April 2015

- Site Boundary
- Analysis Area (1/2 mile Buffer of Site Boundary)
- County Boundary
- Map Grid
- State Highway
- Local Road
- Proposed Strawberry Substation *

Proposed Project Facilities

- Turbine
- Met Tower
- Intraconnection Lines (Option 1)
- Electrical Collector Line

Access Road

- New Road To Be Constructed
- Private Road To Be Improved
- O&M Facility
- Construction Yard

Substation

- Primary
- Alternate

Land Use

- Developed-Dryland Wheat
- Developed-Irrigated Agriculture
- Developed-Other
- Developed-Revegetated or Other Planted Grassland
- Grassland-Exotic Annual
- Grassland-Native Perennial
- Riparian-Trees
- Shrub-steppe-Basin Big Sagebrush
- Shrub-steppe-Rabbitbrush/Snakeweed
- High Value Farmland

TETRA TECH

1:24,000 1 inch = 2,000 feet WGS84 UTM 11

0 0.25 0.5 1 1.5 2 Miles

Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries / Northwest Wildlife Consultants: land use / Tetra Tech: high value farmland

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Figure K-5.17
Figure K-5.18

Vey Rd

1
2
3
4
5
6
7
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9
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11
12
13
14
15
16
4

Figure K-5.18
Figure K-5.16

Figure K-5.18

Wheatridge Wind Energy Facility

Land Use

- Maximum Project Impact - GE 1.7-103 Project Facilities and Option 1 230kV Intraconnection Lines

Details Map

Morrow and Umatilla Counties, OR
April 2015

- Site Boundary
- Analysis Area (1/2 mile Buffer of Site Boundary)
- County Boundary
- Map Grid
- State Highway
- Local Road
- Proposed Strawberry Substation *

Proposed Project Facilities

- Turbine
- Met Tower
- Intraconnection Lines (Option 1)
- Electrical Collector Line

Access Road

- New Road To Be Constructed
- Private Road To Be Improved
- O&M Facility
- Construction Yard

Substation

- Primary
- Alternate

Land Use

- Developed-Dryland Wheat
- Developed-Irrigated Agriculture
- Developed-Other
- Developed-Revegetated or Other Planted Grassland
- Grassland-Exotic Annual
- Grassland-Native Perennial
- Riparian-Trees
- Shrub-steppe-Basin Big Sagebrush
- Shrub-steppe-Rabbitbrush/Snakeweed
- High Value Farmland

1:24,000 1 inch = 2,000 feet WGS84 UTM 11

0 0.25 0.5 1 1.5 2 Miles

Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries / Northwest Wildlife Consultants: land use / Tetra Tech: high value farmland

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TETRA TECH

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Figure K-5

Wheatridge Wind Energy Facility

Land Use

- Maximum Project Impact - GE 1.7-103 Project Facilities and Option 1 230kV Intraconnection Lines

Morrow and Umatilla Counties, OR
April 2015

Wheatridge West

Wheatridge East

Intraconnection Corridor

Umatilla County
Morrow County

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

207 74

Wells Springs Rd
Baker Ln
Little Juniper Ln
Strawberry Ln
Basel Ine Rd
Juniper Canyon Rd
Lexington Grange Rd
Nichols Rd
Bell Canyon Loop
Bombing Range Rd
Patterson Ferry Rd
Kilkenny Rd
Barnhart Rd
Ione Lexington Rd

- Site Boundary
- Analysis Area (1/2 mile Buffer of Site Boundary)
- Map Grid
- Leased Parcels
- County Boundary
- State Highway
- Local Road
- Proposed Strawberry Substation *

Proposed Project Facilities

- Turbine

Land Use

- Developed-Dryland Wheat
- Developed-Irrigated Agriculture
- Developed-Other
- Developed-Revegetated or Other Planted Grassland
- Grassland-Exotic Annual
- Grassland-Native Perennial
- Riparian-Trees
- Shrub-steppe-Basin Big Sagebrush
- Shrub-steppe-Rabbitbrush/ Snakeweed
- High Value Farmland **

*** To be constructed and owned by the Umatilla Electric Cooperative or the Umatilla Electric Cooperative with the Columbia Basin Electric Cooperative**

**** High value farmland is not displayed on this index map due to constraints of scale. High value farmland is displayed on figures K-5.-1 thru K-5.18**

1:140,000 WGS84 UTM 11

0 1 2 4 6 8 10 12 14 16 18 20 Miles

Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries / Northwest Wildlife Consultants: land use

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Figure K-6.1

Wheatridge Wind Energy Facility

Land Use

- Minimum Project Impact -
GE 2.5-120 Project Facilities and Option 3 230kV Intraconnection Lines

Details Map

Morrow and Umatilla Counties, OR
April 2015

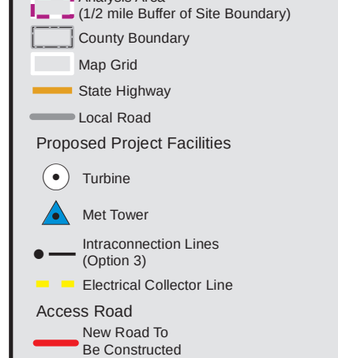
Site Boundary
Analysis Area (1/2 mile Buffer of Site Boundary)
County Boundary
Map Grid
State Highway
Local Road

Proposed Project Facilities
- Turbine
- Met Tower
- Intraconnection Lines (Option 3)
- Electrical Collector Line

Access Road
- New Road To Be Constructed
- Private Road To Be Improved
- O&M Facility
- Construction Yard

Substation
- Primary
- Alternate

Land Use
- Developed-Dryland Wheat
- Developed-Irrigated Agriculture
- Developed-Other
- Developed-Revegetated or Other Planted Grassland
- Grassland-Exotic Annual
- Grassland-Native Perennial
- Riparian-Trees
- Shrub-steppe-Basin Big Sagebrush
- Shrub-steppe-Rabbitbrush/Snakeweed
- High Value Farmland



TETRA TECH

Bombing Range Rd
Immigrant Ln
1
Figure K-6.1
Figure K-6.2

1:24,000 1 inch = 2,000 feet WGS84 UTM 11

0 0.25 0.5 1 1.5 2 Miles

Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries / Northwest Wildlife Consultants: land use / Tetra Tech: high value farmland

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Figure K-6.1
Figure K-6.2

Wells Springs Rd

Little Juniper Ln

Juniper Canyon Rd

Barak Martin Rd W

Figure K-6.2
Figure K-6.3

Figure K-6.2
Figure K-6.4

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 46

Figure K-6.2

Wheatridge Wind Energy Facility

Land Use

- Minimum Project Impact - GE 2.5-120 Project Facilities and Option 3 230kV Intraconnection Lines

Details Map

Morrow and Umatilla Counties, OR
April 2015

- Site Boundary
- Analysis Area (1/2 mile Buffer of Site Boundary)
- County Boundary
- Map Grid
- State Highway
- Local Road

Proposed Project Facilities

- Turbine
- Met Tower
- Intraconnection Lines (Option 3)
- Electrical Collector Line

Access Road

- New Road To Be Constructed
- Private Road To Be Improved
- O&M Facility
- Construction Yard

Substation

- Primary
- Alternate

Land Use

- Developed-Dryland Wheat
- Developed-Irrigated Agriculture
- Developed-Other
- Developed-Revegetated or Other Planted Grassland
- Grassland-Exotic Annual
- Grassland-Native Perennial
- Riparian-Trees
- Shrub-steppe-Basin Big Sagebrush
- Shrub-steppe-Rabbitbrush/Snakeweed
- High Value Farmland

TETRA TECH

1:24,000 1 inch = 2,000 feet WGS84 UTM 11

0 0.25 0.5 1 1.5 2 Miles

Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries / Northwest Wildlife Consultants: land use / Tetra Tech: high value farmland

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1:24,000 1 inch = 2,000 feet WGS84 UTM 11

0 0.25 0.5 1 1.5 2 Miles

Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries / Northwest Wildlife Consultants: land use / Tetra Tech: high value farmland

Figure K-6.3

Wheatridge Wind Energy Facility

Land Use

- Minimum Project Impact - GE 2.5-120 Project Facilities and Option 3 230kV Intraconnection Lines

Details Map

Morrow and Umatilla Counties, OR
April 2015

- Site Boundary
- Analysis Area (1/2 mile Buffer of Site Boundary)
- County Boundary
- Map Grid
- State Highway
- Local Road

Proposed Project Facilities

- Turbine
- Met Tower
- Intraconnection Lines (Option 3)
- Electrical Collector Line

Access Road

- New Road To Be Constructed
- Private Road To Be Improved
- O&M Facility
- Construction Yard

Substation

- Primary
- Alternate

Land Use

- Developed-Dryland Wheat
- Developed-Irrigated Agriculture
- Developed-Other
- Developed-Revegetated or Other Planted Grassland
- Grassland-Exotic Annual
- Grassland-Native Perennial
- Riparian-Trees
- Shrub-steppe-Basin Big Sagebrush
- Shrub-steppe-Rabbitbrush/Snakeweed
- High Value Farmland

TETRA TECH

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Figure K-6.4

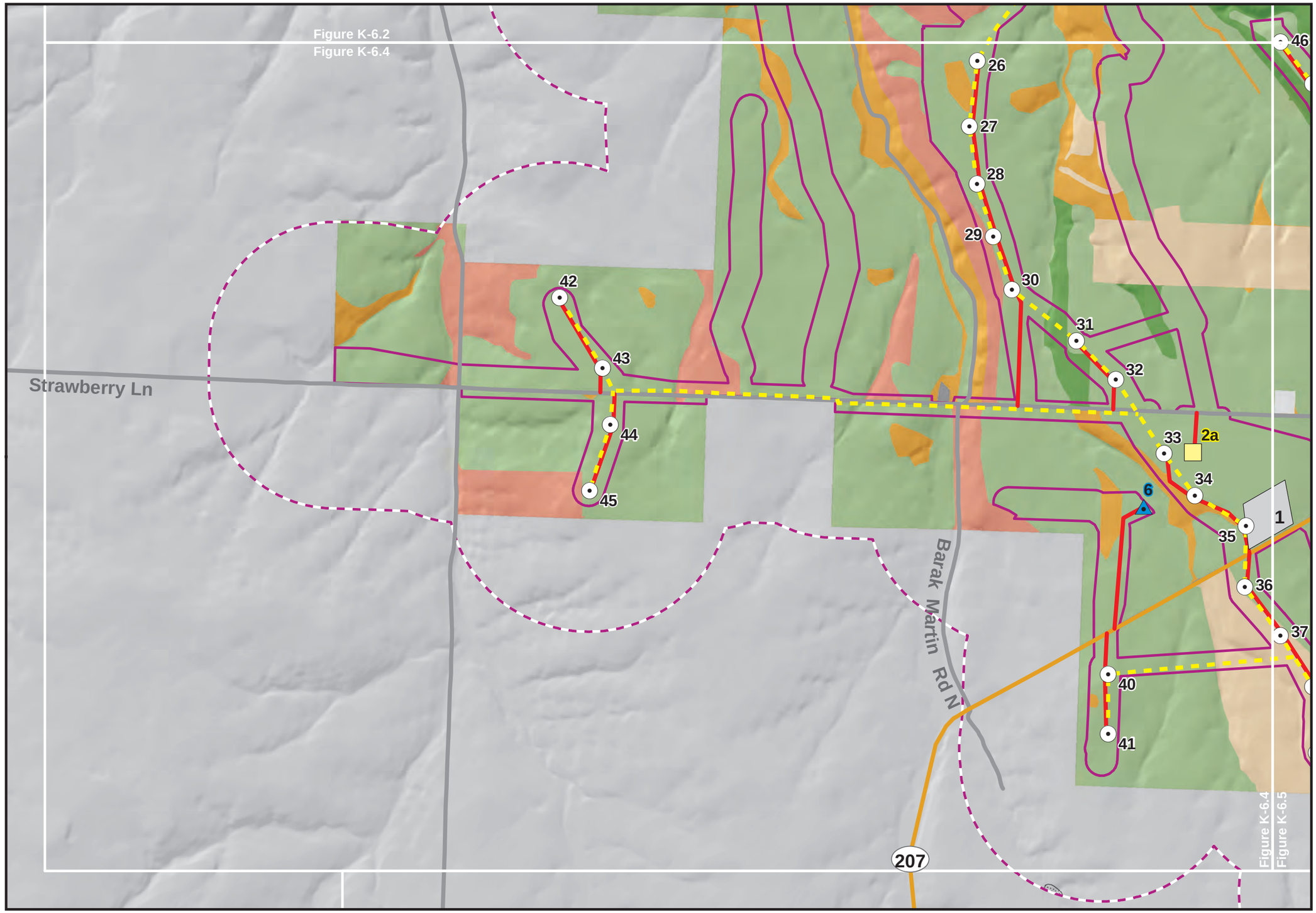
Wheatridge Wind Energy Facility

Land Use

- Minimum Project Impact -
GE 2.5-120 Project Facilities and Option 3 230kV Intraconnection Lines

Details Map

Morrow and Umatilla Counties, OR
April 2015



- Site Boundary
- Analysis Area (1/2 mile Buffer of Site Boundary)
- County Boundary
- Map Grid
- State Highway
- Local Road

Proposed Project Facilities

- Turbine
- Met Tower
- Intraconnection Lines (Option 3)
- Electrical Collector Line

Access Road

- New Road To Be Constructed
- Private Road To Be Improved
- O&M Facility
- Construction Yard

Substation

- Primary
- Alternate

Land Use

- Developed-Dryland Wheat
- Developed-Irrigated Agriculture
- Developed-Other
- Developed-Revegetated or Other Planted Grassland
- Grassland-Exotic Annual
- Grassland-Native Perennial
- Riparian-Trees
- Shrub-steppe-Basin Big Sagebrush
- Shrub-steppe-Rabbitbrush/Snakeweed
- High Value Farmland

1:24,000 1 inch = 2,000 feet WGS84 UTM 11

0 0.25 0.5 1 1.5 2 Miles

Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries / Northwest Wildlife Consultants: land use / Tetra Tech: high value farmland

TETRA TECH

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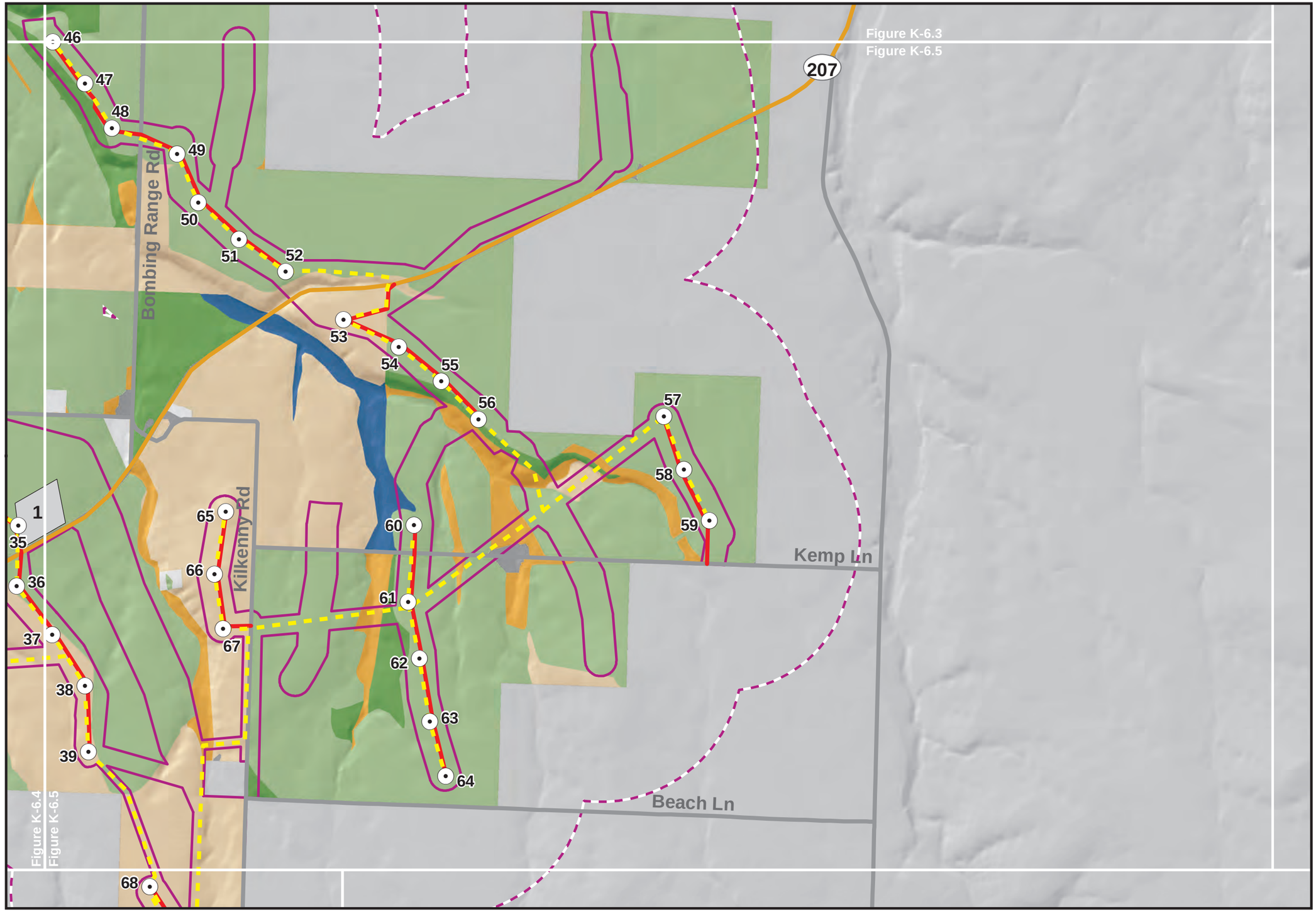

1:24,000 1 inch = 2,000 feet WGS84 UTM 11

0 0.25 0.5 1 1.5 2 Miles

Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries / Northwest Wildlife Consultants: land use / Tetra Tech: high value farmland

Figure K-6.5

Wheatridge Wind Energy Facility

Land Use

- Minimum Project Impact - GE 2.5-120 Project Facilities and Option 3 230kV Intraconnection Lines

Details Map

Morrow and Umatilla Counties, OR
April 2015

- Site Boundary
- Analysis Area (1/2 mile Buffer of Site Boundary)
- County Boundary
- Map Grid
- State Highway
- Local Road

Proposed Project Facilities

- Turbine
- Met Tower
- Intraconnection Lines (Option 3)
- Electrical Collector Line

Access Road

- New Road To Be Constructed
- Private Road To Be Improved
- O&M Facility
- Construction Yard

Substation

- Primary
- Alternate

Land Use

- Developed-Dryland Wheat
- Developed-Irrigated Agriculture
- Developed-Other
- Developed-Revegetated or Other Planted Grassland
- Grassland-Exotic Annual
- Grassland-Native Perennial
- Riparian-Trees
- Shrub-steppe-Basin Big Sagebrush
- Shrub-steppe-Rabbitbrush/Snakeweed
- High Value Farmland

TETRA TECH

Figure K-6.6

Wheatridge Wind Energy Facility

Land Use

- Minimum Project Impact - GE 2.5-120 Project Facilities and Option 3 230kV Intraconnection Lines

Details Map

Morrow and Umatilla Counties, OR
April 2015

Juniper Canyon Rd
Lexington Grange Rd
BaseLine Rd
Kilkenny Rd
Cutsforth Rd
Nichols Rd
Turner Ln
207
Figure K-6.6
Figure K-6.7

Site Boundary
Analysis Area (1/2 mile Buffer of Site Boundary)
County Boundary
Map Grid
State Highway
Local Road

Proposed Project Facilities
- Turbine
- Met Tower
- Intraconnection Lines (Option 3)
- Electrical Collector Line

Access Road
- New Road To Be Constructed
- Private Road To Be Improved
- O&M Facility
- Construction Yard

Substation
- Primary
- Alternate

Land Use
- Developed-Dryland Wheat
- Developed-Irrigated Agriculture
- Developed-Other
- Developed-Revegetated or Other Planted Grassland
- Grassland-Exotic Annual
- Grassland-Native Perennial
- Riparian-Trees
- Shrub-steppe-Basin Big Sagebrush
- Shrub-steppe-Rabbitbrush/Snakeweed
- High Value Farmland

1:24,000 1 inch = 2,000 feet WGS84 UTM 11

0 0.25 0.5 1 1.5 2 Miles

Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries / Northwest Wildlife Consultants: land use / Tetra Tech: high value farmland

TETRA TECH

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Figure K-6.7

Wheatridge Wind Energy Facility

Land Use

- Minimum Project Impact - GE 2.5-120 Project Facilities and Option 3 230kV Intraconnection Lines

Details Map

Morrow and Umatilla Counties, OR
April 2015

Figure K-6.6
Figure K-6.7

Myers Ln
BaseLine Rd
Sand Hollow Rd
Spur Ln
Cutsforth Rd
Dowell Rd

71 72 73 74 75 76 77 95 98 99 100 101 102 103 104 105 113 114 2b

- Site Boundary
- Analysis Area (1/2 mile Buffer of Site Boundary)
- County Boundary
- Map Grid
- State Highway
- Local Road

Proposed Project Facilities

- Turbine
- Met Tower
- Intraconnection Lines (Option 3)
- Electrical Collector Line

Access Road

- New Road To Be Constructed
- Private Road To Be Improved
- O&M Facility
- Construction Yard

Substation

- Primary
- Alternate

Land Use

- Developed-Dryland Wheat
- Developed-Irrigated Agriculture
- Developed-Other
- Developed-Revegetated or Other Planted Grassland
- Grassland-Exotic Annual
- Grassland-Native Perennial
- Riparian-Trees
- Shrub-steppe-Basin Big Sagebrush
- Shrub-steppe-Rabbitbrush/Snakeweed
- High Value Farmland

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

1:24,000 1 inch = 2,000 feet WGS84 UTM 11

0 0.25 0.5 1 1.5 2 Miles

Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries / Northwest Wildlife Consultants: land use / Tetra Tech: high value farmland

TETRA TECH

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Figure K-6.8

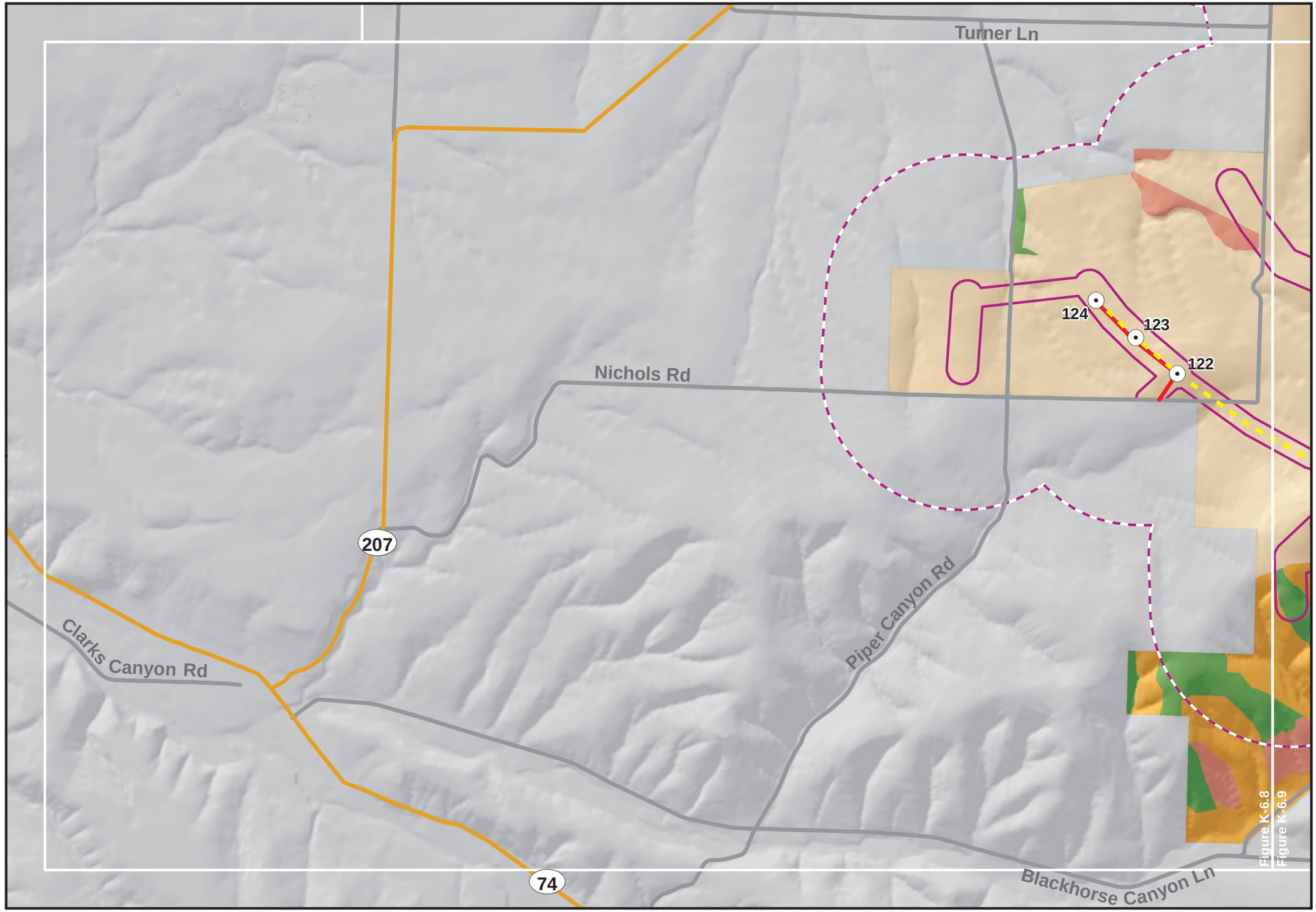
Wheatridge Wind Energy Facility

Land Use

- Minimum Project Impact - GE 2.5-120 Project Facilities and Option 3 230kV Intraconnection Lines

Details Map

Morrow and Umatilla Counties, OR
April 2015



- Site Boundary
- Analysis Area (1/2 mile Buffer of Site Boundary)
- County Boundary
- Map Grid
- State Highway
- Local Road

Proposed Project Facilities

- Turbine
- Met Tower
- Intraconnection Lines (Option 3)
- Electrical Collector Line

Access Road

- New Road To Be Constructed
- Private Road To Be Improved
- O&M Facility
- Construction Yard

Substation

- Primary
- Alternate

Land Use

- Developed-Dryland Wheat
- Developed-Irrigated Agriculture
- Developed-Other
- Developed-Revegetated or Other Planted Grassland
- Grassland-Exotic Annual
- Grassland-Native Perennial
- Riparian-Trees
- Shrub-steppe-Basin Big Sagebrush
- Shrub-steppe-Rabbitbrush/Snakeweed
- High Value Farmland

TETRA TECH

1:24,000 1 inch = 2,000 feet WGS84 UTM 11

0 0.25 0.5 1 1.5 2 Miles

Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries / Northwest Wildlife Consultants: land use / Tetra Tech: high value farmland

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Figure K-6.9

Wheatridge Wind Energy Facility

Land Use

- Minimum Project Impact - GE 2.5-120 Project Facilities and Option 3 230kV Intraconnection Lines

Details Map

Morrow and Umatilla Counties, OR
April 2015

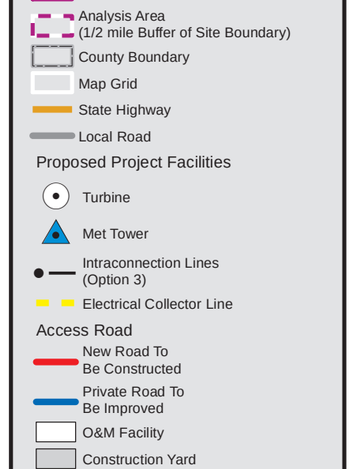
Site Boundary
Analysis Area (1/2 mile Buffer of Site Boundary)
County Boundary
Map Grid
State Highway
Local Road

Proposed Project Facilities
- Turbine
- Met Tower
- Intraconnection Lines (Option 3)
- Electrical Collector Line

Access Road
- New Road To Be Constructed
- Private Road To Be Improved
- O&M Facility
- Construction Yard

Substation
- Primary
- Alternate

Land Use
- Developed-Dryland Wheat
- Developed-Irrigated Agriculture
- Developed-Other
- Developed-Revegetated or Other Planted Grassland
- Grassland-Exotic Annual
- Grassland-Native Perennial
- Riparian-Trees
- Shrub-steppe-Basin Big Sagebrush
- Shrub-steppe-Rabbitbrush/Snakeweed
- High Value Farmland



TETRA TECH

1:24,000 1 inch = 2,000 feet WGS84 UTM 11

0 0.25 0.5 1 1.5 2 Miles

Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries / Northwest Wildlife Consultants: land use / Tetra Tech: high value farmland

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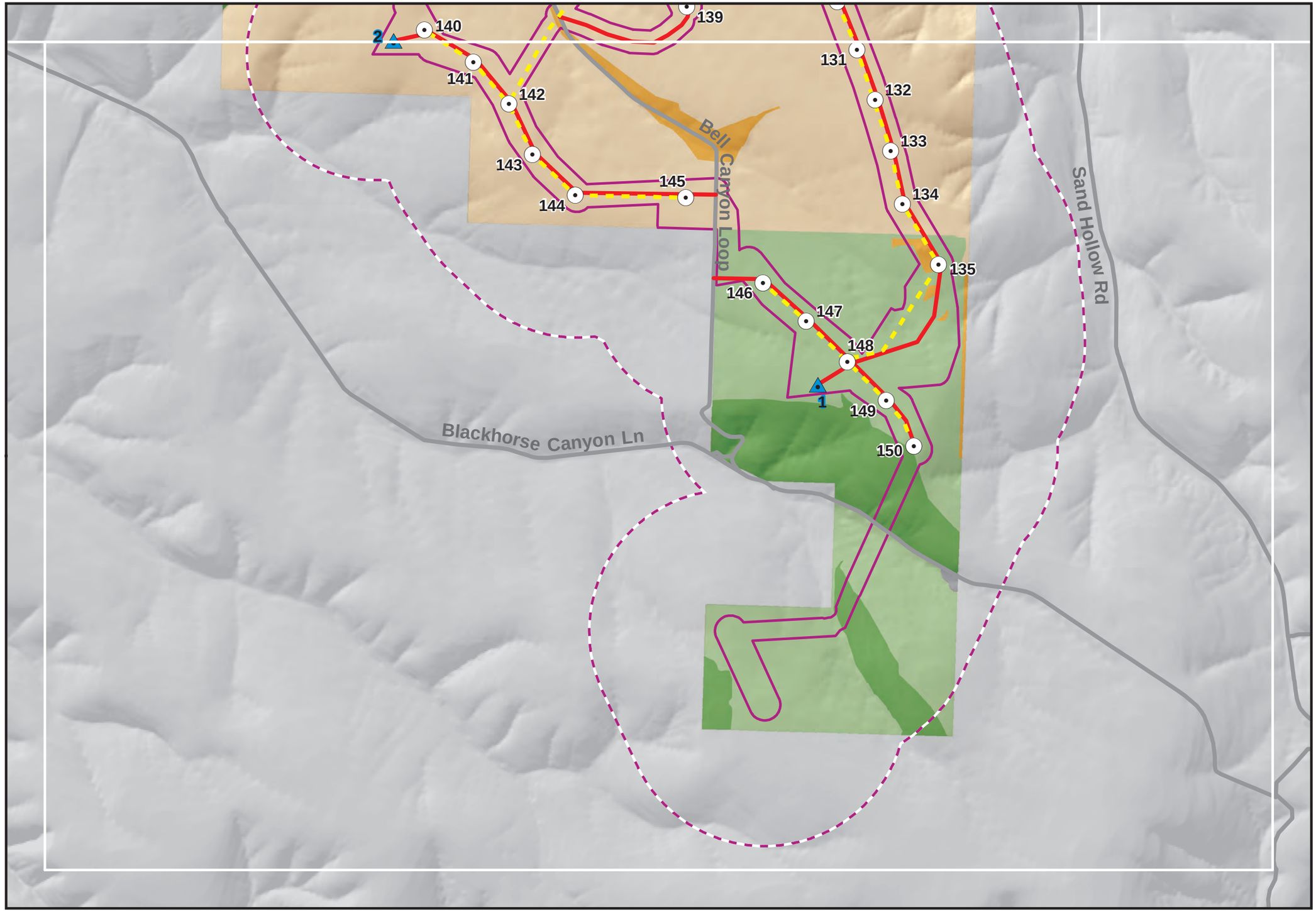


Figure K-6.10

Wheatridge Wind Energy Facility

Land Use

- Minimum Project Impact - GE 2.5-120 Project Facilities and Option 3 230kV Intraconnection Lines

Details Map

Morrow and Umatilla Counties, OR
April 2015

- Site Boundary
- Analysis Area (1/2 mile Buffer of Site Boundary)
- County Boundary
- Map Grid
- State Highway
- Local Road

Proposed Project Facilities

- Turbine
- Met Tower
- Intraconnection Lines (Option 3)
- Electrical Collector Line

Access Road

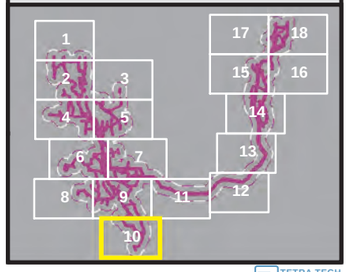
- New Road To Be Constructed
- Private Road To Be Improved
- O&M Facility
- Construction Yard

Substation

- Primary
- Alternate

Land Use

- Developed-Dryland Wheat
- Developed-Irrigated Agriculture
- Developed-Other
- Developed-Revegetated or Other Planted Grassland
- Grassland-Exotic Annual
- Grassland-Native Perennial
- Riparian-Trees
- Shrub-steppe-Basin Big Sagebrush
- Shrub-steppe-Rabbitbrush/Snakeweed
- High Value Farmland



TETRA TECH

1:24,000 1 inch = 2,000 feet WGS84 UTM 11

0 0.25 0.5 1 1.5 2 Miles

Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries / Northwest Wildlife Consultants: land use / Tetra Tech: high value farmland

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Figure K-6.9
Figure K-6.11

Spur Lp

Sand Hollow Rd

Figure K-6.11

Wheatridge Wind Energy Facility

Land Use

- Minimum Project Impact - GE 2.5-120 Project Facilities and Option 3 230kV Intraconnection Lines

Details Map

Morrow and Umatilla Counties, OR
April 2015

- Site Boundary
- Analysis Area (1/2 mile Buffer of Site Boundary)
- County Boundary
- Map Grid
- State Highway
- Local Road

Proposed Project Facilities

- Turbine
- Met Tower
- Intraconnection Lines (Option 3)
- Electrical Collector Line

Access Road

- New Road To Be Constructed
- Private Road To Be Improved
- O&M Facility
- Construction Yard

Substation

- Primary
- Alternate

Land Use

- Developed-Dryland Wheat
- Developed-Irrigated Agriculture
- Developed-Other
- Developed-Revegetated or Other Planted Grassland
- Grassland-Exotic Annual
- Grassland-Native Perennial
- Riparian-Trees
- Shrub-steppe-Basin Big Sagebrush
- Shrub-steppe-Rabbitbrush/Snakeweed
- High Value Farmland

1:24,000 1 inch = 2,000 feet WGS84 UTM 11

0 0.25 0.5 1 1.5 2 Miles

Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries / Northwest Wildlife Consultants: land use / Tetra Tech: high value farmland

TETRA TECH

Figure K-6.12

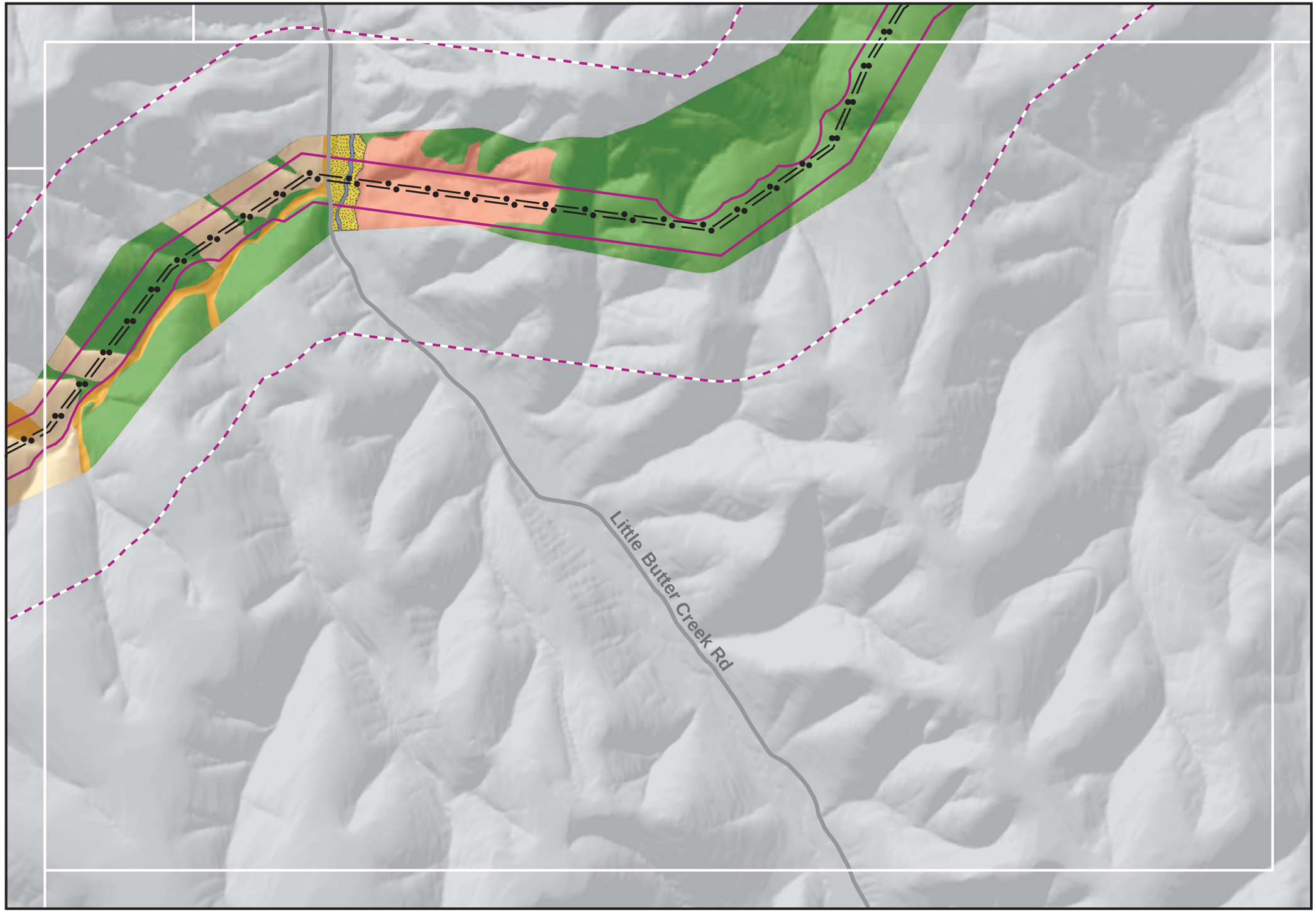
Wheatridge Wind Energy Facility

Land Use

- Minimum Project Impact -
GE 2.5-120 Project Facilities and Option 3 230kV Intraconnection Lines

Details Map

Morrow and Umatilla Counties, OR
April 2015



- Site Boundary
- Analysis Area (1/2 mile Buffer of Site Boundary)
- County Boundary
- Map Grid
- State Highway
- Local Road

Proposed Project Facilities

- Turbine
- Met Tower
- Intraconnection Lines (Option 3)
- Electrical Collector Line

Access Road

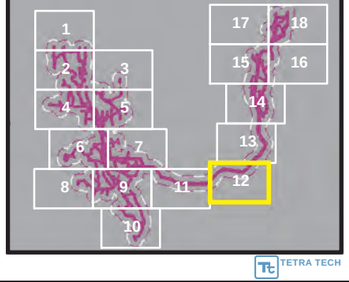
- New Road To Be Constructed
- Private Road To Be Improved
- O&M Facility
- Construction Yard

Substation

- Primary
- Alternate

Land Use

- Developed-Dryland Wheat
- Developed-Irrigated Agriculture
- Developed-Other
- Developed-Revegetated or Other Planted Grassland
- Grassland-Exotic Annual
- Grassland-Native Perennial
- Riparian-Trees
- Shrub-steppe-Basin Big Sagebrush
- Shrub-steppe-Rabbitbrush/Snakeweed
- High Value Farmland



1:24,000 1 inch = 2,000 feet WGS84 UTM 11

0 0.25 0.5 1 1.5 2 Miles

Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries / Northwest Wildlife Consultants: land use / Tetra Tech: high value farmland

TETRA TECH

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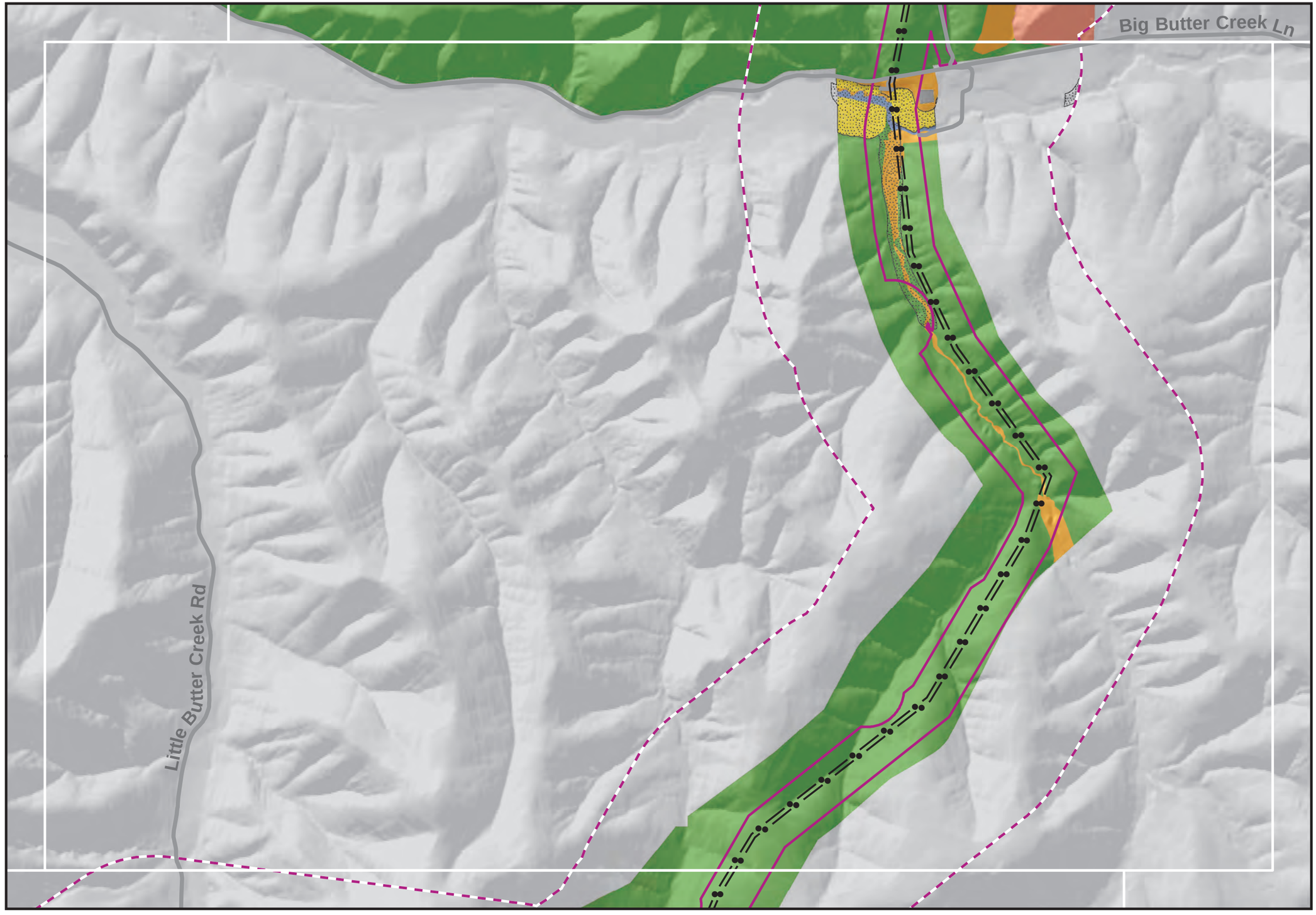

Figure K-6.13

Wheatridge Wind Energy Facility

Land Use

- Minimum Project Impact - GE 2.5-120 Project Facilities and Option 3 230kV Intraconnection Lines

Details Map

Morrow and Umatilla Counties, OR
April 2015

- Site Boundary
- Analysis Area (1/2 mile Buffer of Site Boundary)
- County Boundary
- Map Grid
- State Highway
- Local Road

Proposed Project Facilities

- Turbine
- Met Tower
- Intraconnection Lines (Option 3)
- Electrical Collector Line

Access Road

- New Road To Be Constructed
- Private Road To Be Improved
- O&M Facility
- Construction Yard

Substation

- Primary
- Alternate

Land Use

- Developed-Dryland Wheat
- Developed-Irrigated Agriculture
- Developed-Other
- Developed-Revegetated or Other Planted Grassland
- Grassland-Exotic Annual
- Grassland-Native Perennial
- Riparian-Trees
- Shrub-steppe-Basin Big Sagebrush
- Shrub-steppe-Rabbitbrush/Snakeweed
- High Value Farmland

TETRA TECH

1:24,000 1 inch = 2,000 feet WGS84 UTM 11

0 0.25 0.5 1 1.5 2 Miles

Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries / Northwest Wildlife Consultants: land use / Tetra Tech: high value farmland

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Figure K-6.14

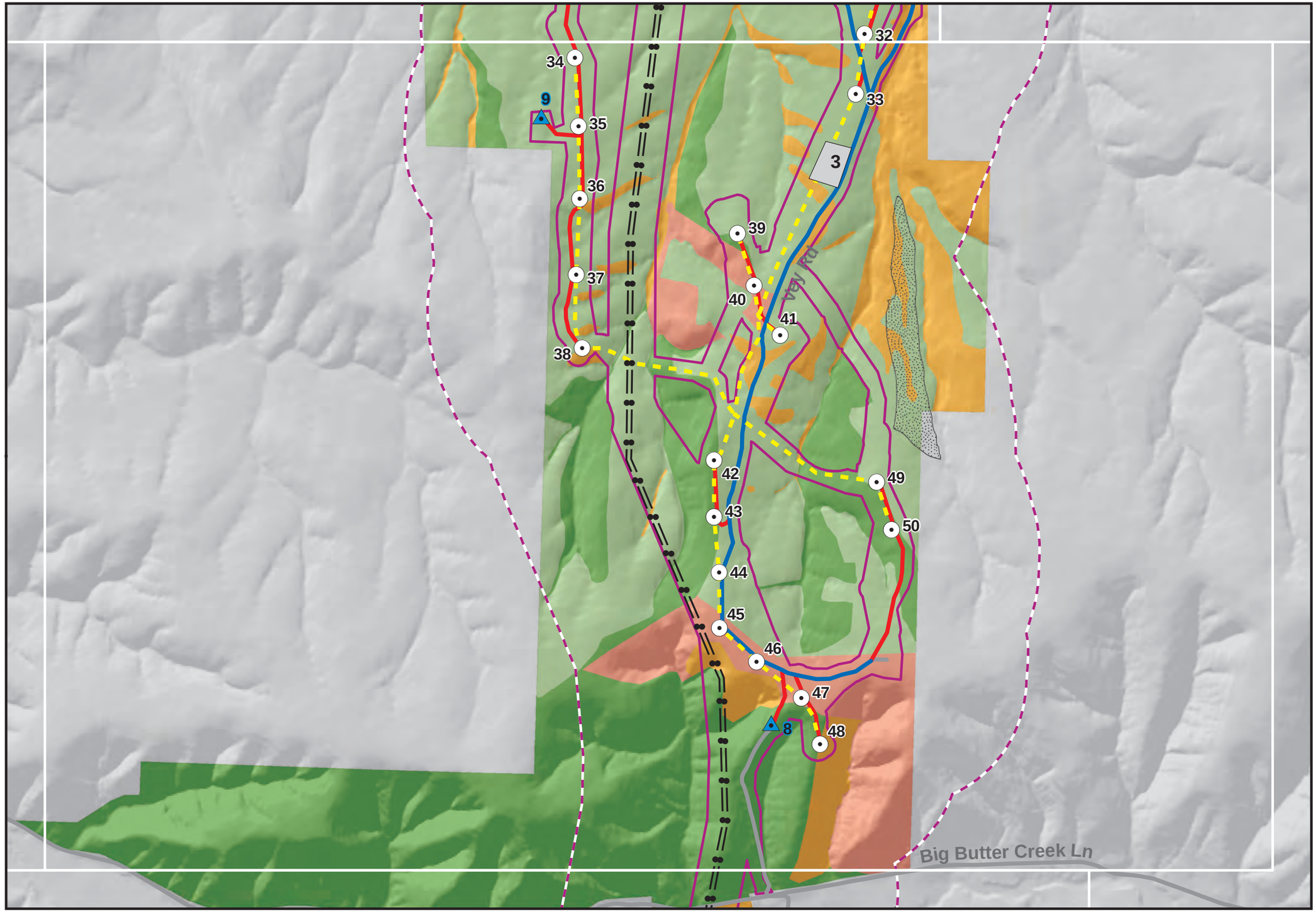
Wheatridge Wind Energy Facility

Land Use

- Minimum Project Impact - GE 2.5-120 Project Facilities and Option 3 230kV Intraconnection Lines

Details Map

Morrow and Umatilla Counties, OR
April 2015



- Site Boundary
- Analysis Area (1/2 mile Buffer of Site Boundary)
- County Boundary
- Map Grid
- State Highway
- Local Road

Proposed Project Facilities

- Turbine
- Met Tower
- Intraconnection Lines (Option 3)
- Electrical Collector Line

Access Road

- New Road To Be Constructed
- Private Road To Be Improved
- O&M Facility
- Construction Yard

Substation

- Primary
- Alternate

Land Use

- Developed-Dryland Wheat
- Developed-Irrigated Agriculture
- Developed-Other
- Developed-Revegetated or Other Planted Grassland
- Grassland-Exotic Annual
- Grassland-Native Perennial
- Riparian-Trees
- Shrub-steppe-Basin Big Sagebrush
- Shrub-steppe-Rabbitbrush/Snakeweed
- High Value Farmland

1:24,000 1 inch = 2,000 feet WGS84 UTM 11

0 0.25 0.5 1 1.5 2 Miles

Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries / Northwest Wildlife Consultants: land use / Tetra Tech: high value farmland

TETRA TECH

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Figure K-6.17
Figure K-6.15

Umatilla County
Morrow County

Figure K-6.15
Figure K-6.16

1:24,000 1 inch = 2,000 feet WGS84 UTM 11

0 0.25 0.5 1 1.5 2 Miles

Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries / Northwest Wildlife Consultants: land use / Tetra Tech: high value farmland

Figure K-6.15

Wheatridge Wind Energy Facility

Land Use

- Minimum Project Impact - GE 2.5-120 Project Facilities and Option 3 230kV Intraconnection Lines

Details Map

Morrow and Umatilla Counties, OR
April 2015

- Site Boundary
- Analysis Area (1/2 mile Buffer of Site Boundary)
- County Boundary
- Map Grid
- State Highway
- Local Road

Proposed Project Facilities

- Turbine
- Met Tower
- Intraconnection Lines (Option 3)
- Electrical Collector Line

Access Road

- New Road To Be Constructed
- Private Road To Be Improved
- O&M Facility
- Construction Yard

Substation

- Primary
- Alternate

Land Use

- Developed-Dryland Wheat
- Developed-Irrigated Agriculture
- Developed-Other
- Developed-Revegetated or Other Planted Grassland
- Grassland-Exotic Annual
- Grassland-Native Perennial
- Riparian-Trees
- Shrub-steppe-Basin Big Sagebrush
- Shrub-steppe-Rabbitbrush/Snakeweed
- High Value Farmland

TETRA TECH

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Figure K-6.18
Figure K-6.16

13
14
15
16
17
18
19
11

Vey Rd

Umatilla County
Morrow County

Figure K-6.15
Figure K-6.16

Figure K-6.16

Wheatridge Wind Energy Facility

Land Use

- Minimum Project Impact - GE 2.5-120 Project Facilities and Option 3 230kV Intraconnection Lines

Details Map

Morrow and Umatilla Counties, OR
April 2015

- Site Boundary
- Analysis Area (1/2 mile Buffer of Site Boundary)
- County Boundary
- Map Grid
- State Highway
- Local Road

Proposed Project Facilities

- Turbine
- Met Tower
- Intraconnection Lines (Option 3)
- Electrical Collector Line

Access Road

- New Road To Be Constructed
- Private Road To Be Improved
- O&M Facility
- Construction Yard

Substation

- Primary
- Alternate

Land Use

- Developed-Dryland Wheat
- Developed-Irrigated Agriculture
- Developed-Other
- Developed-Revegetated or Other Planted Grassland
- Grassland-Exotic Annual
- Grassland-Native Perennial
- Riparian-Trees
- Shrub-steppe-Basin Big Sagebrush
- Shrub-steppe-Rabbitbrush/Snakeweed
- High Value Farmland

TETRA TECH

1:24,000 1 inch = 2,000 feet WGS84 UTM 11

0 0.25 0.5 1 1.5 2 Miles

Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries / Northwest Wildlife Consultants: land use / Tetra Tech: high value farmland

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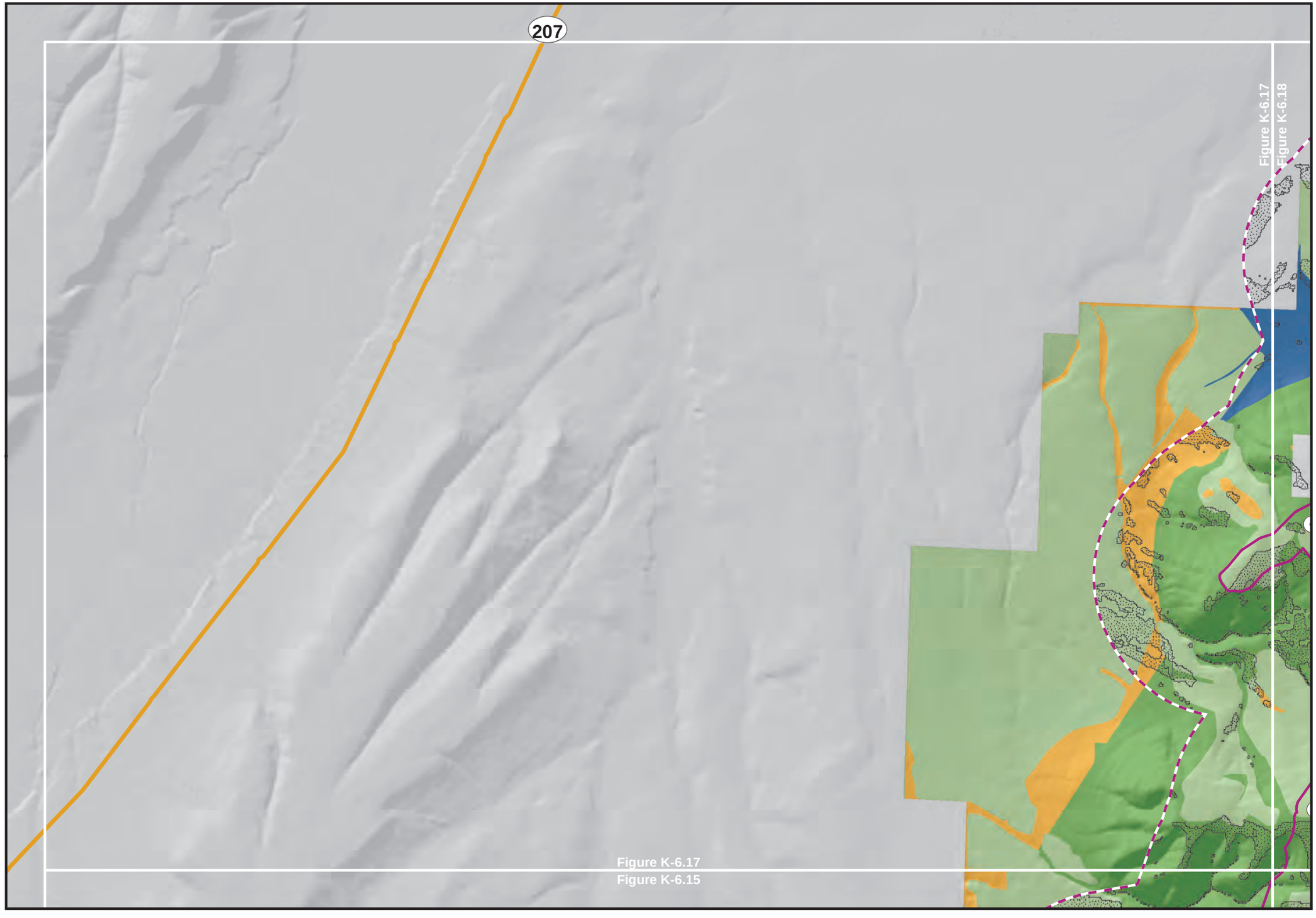


Figure K-6.17

Wheatridge Wind Energy Facility

Land Use

- Minimum Project Impact - GE 2.5-120 Project Facilities and Option 3 230kV Intraconnection Lines

Details Map

Morrow and Umatilla Counties, OR
April 2015

- Site Boundary
- Analysis Area (1/2 mile Buffer of Site Boundary)
- County Boundary
- Map Grid
- State Highway
- Local Road

Proposed Project Facilities

- Turbine
- Met Tower
- Intraconnection Lines (Option 3)
- Electrical Collector Line

Access Road

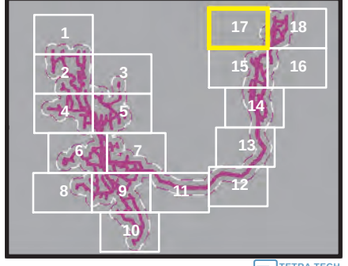
- New Road To Be Constructed
- Private Road To Be Improved
- O&M Facility
- Construction Yard

Substation

- Primary
- Alternate

Land Use

- Developed-Dryland Wheat
- Developed-Irrigated Agriculture
- Developed-Other
- Developed-Revegetated or Other Planted Grassland
- Grassland-Exotic Annual
- Grassland-Native Perennial
- Riparian-Trees
- Shrub-steppe-Basin Big Sagebrush
- Shrub-steppe-Rabbitbrush/Snakeweed
- High Value Farmland



TETRA TECH

1:24,000 1 inch = 2,000 feet WGS84 UTM 11

0 0.25 0.5 1 1.5 2 Miles

Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries / Northwest Wildlife Consultants: land use / Tetra Tech: high value farmland

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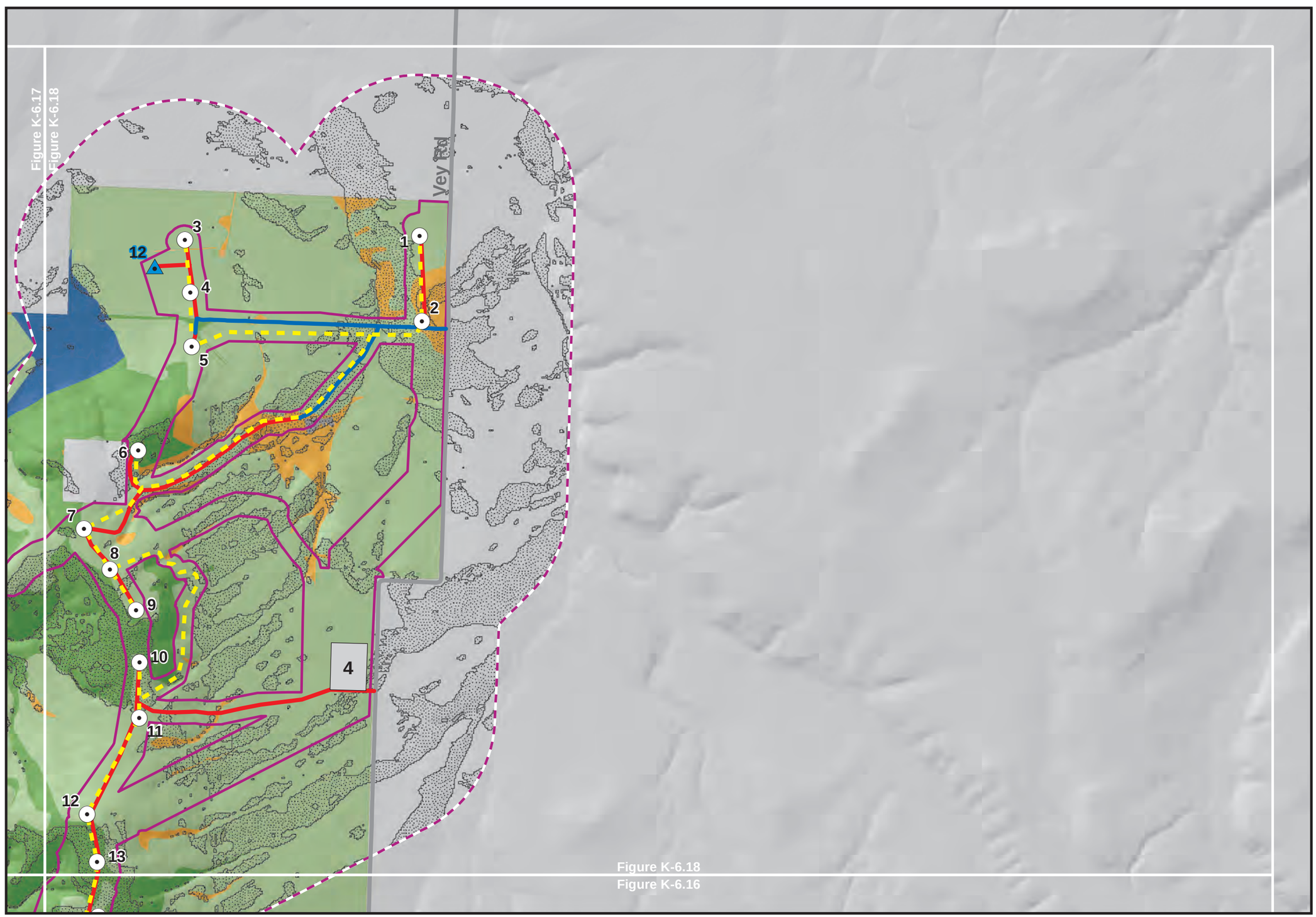

Figure K-6.18

Wheatridge Wind Energy Facility

Land Use

- Minimum Project Impact - GE 2.5-120 Project Facilities and Option 3 230kV Intraconnection Lines

Details Map

Morrow and Umatilla Counties, OR
April 2015

- Site Boundary
- Analysis Area (1/2 mile Buffer of Site Boundary)
- County Boundary
- Map Grid
- State Highway
- Local Road

Proposed Project Facilities

- Turbine
- Met Tower
- Intraconnection Lines (Option 3)
- Electrical Collector Line

Access Road

- New Road To Be Constructed
- Private Road To Be Improved
- O&M Facility
- Construction Yard

Substation

- Primary
- Alternate

Land Use

- Developed-Dryland Wheat
- Developed-Irrigated Agriculture
- Developed-Other
- Developed-Revegetated or Other Planted Grassland
- Grassland-Exotic Annual
- Grassland-Native Perennial
- Riparian-Trees
- Shrub-steppe-Basin Big Sagebrush
- Shrub-steppe-Rabbitbrush/Snakeweed
- High Value Farmland

TETRA TECH

1:24,000 1 inch = 2,000 feet WGS84 UTM 11

0 0.25 0.5 1 1.5 2 Miles

Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries / Northwest Wildlife Consultants: land use / Tetra Tech: high value farmland

Figure K-6

Wheatridge Wind Energy Facility

Land Use

- Minimum Project Impact - GE 2.5-120 Project Facilities and Option 3 230kV Intraconnection Lines

Morrow and Umatilla Counties, OR
April 2015

Wheatridge West

Wheatridge East

Intraconnection Corridor

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

Umatilla County
Morrow County

Baker Ln
Little Juniper Ln
Strawberry Ln
Base Line Rd
Nichols Rd
Bell Canyon Loop
Wells Springs Rd
Juniper Canyon Rd
Lexington Grange Rd
Ione Eightmile Rd
Frank Martin Rd N
Kilkenny Rd
Juniper Canyon Rd
Bombing Range Rd
Cecil Rd
Ritter Rd
Ione Rd
Lexington Rd
Rhea Creek Rd
Cecil Creek Rd
Ruggles Rd
Tower Rd
Ione Cutoff Rd
Ione Rd
Lexington Rd
Rhea Creek Rd
Cecil Creek Rd
Ruggles Rd
Tower Rd
Ione Cutoff Rd

207
74

Land Use

- Developed-Dryland Wheat
- Developed-Irrigated Agriculture
- Developed-Other
- Developed-Revegetated or Other Planted Grassland
- Grassland-Exotic Annual
- Grassland-Native Perennial
- Riparian-Trees
- Shrub-steppe-Basin Big Sagebrush
- Shrub-steppe-Rabbitbrush/ Snakeweed
- High Value Farmland **

- Site Boundary
- Analysis Area (1/2 mile Buffer of Site Boundary)
- Map Grid
- Leased Parcels
- County Boundary
- State Highway
- Local Road

Proposed Project Facilities

- Turbine

* To be constructed and owned by the Umatilla Electric Cooperative or the Umatilla Electric Cooperative with the Columbia Basin Electric Cooperative

** High value farmland is not displayed on this index map due to constraints of scale. High value farmland is displayed on figures K-6.-1 thru K-6.18

1:140,000 WGS84 UTM 11

0 1 2 4 6 8 10 12 14 16 18 20 Miles

Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries / Northwest Wildlife Consultants: land use

TETRA TECH

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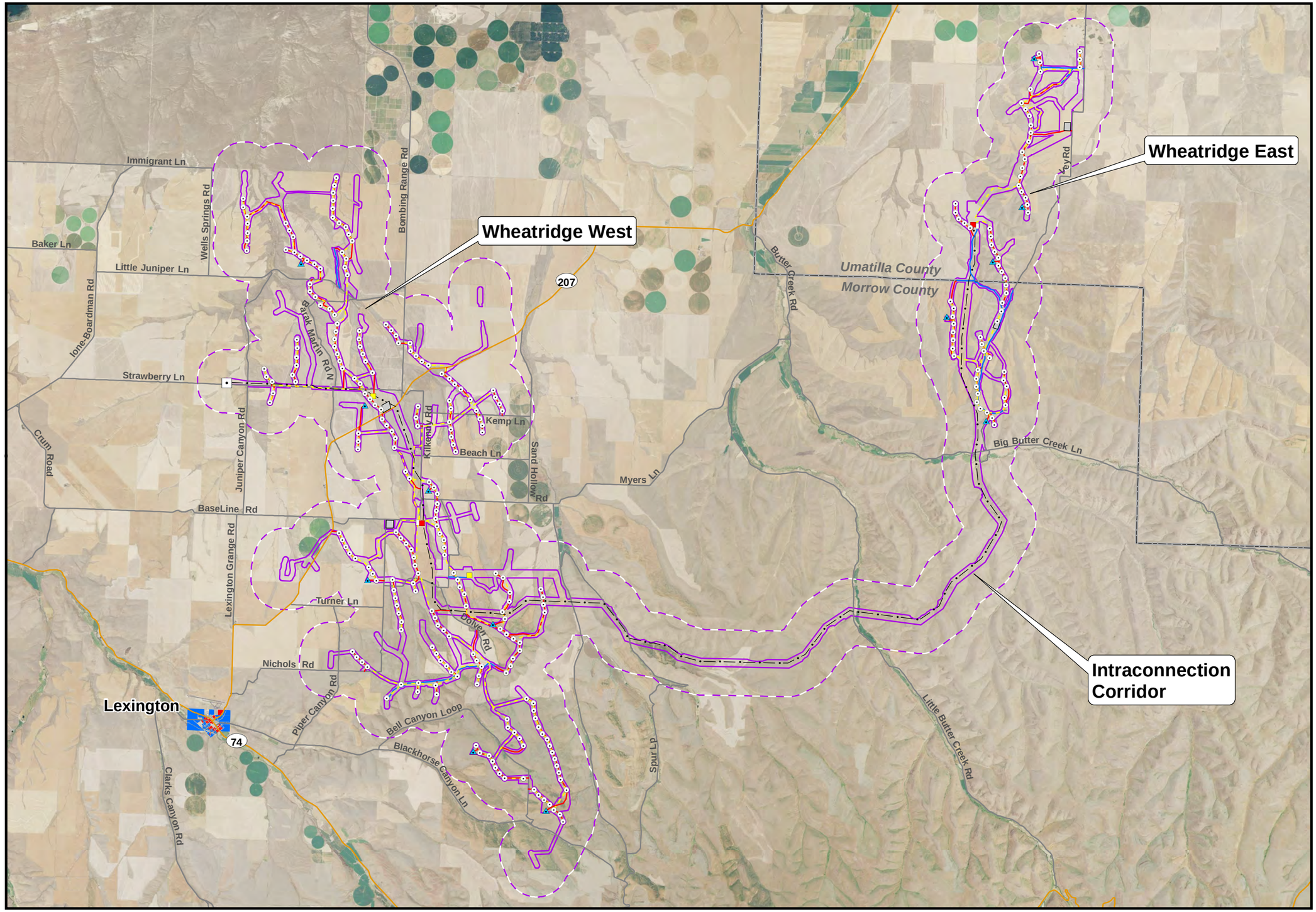
Figure K-7

Wheatridge Wind Energy Facility

Residential Zone Setback

- Maximum Project Impact - GE 1.7-103 Project Facilities and Option 1 230kV Intraconnection Lines

Morrow and Umatilla Counties, OR
December 2014



1:140,000 WGS84 UTM 11

0 1 2 4 6 8 10 12 14 16 18 20 Miles

Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries / Morrow County: zoning / Umatilla County: zoning / USDA NAIP: background imagery

- Site Boundary
- Residential Zone Setback (Site Boundary 3,520 foot Buffer)
- County Boundary
- State Highway
- Local Road
- Proposed Strawberry Substation *

Proposed Project Facilities

- Turbine
- Met Tower
- Intraconnection Lines (Option 1)
- Electrical Collector Line

Access Road

- New Road To Be Constructed
- Private Road To Be Improved
- O&M Facility
- Construction Yard

Substation

- Primary
- Alternate

Zoning **

- Farm Residential Zone
- Residential

* To be constructed and owned by the Umatilla Electric Cooperative or the Umatilla Electric Cooperative with the Columbia Basin Electric Cooperative

** The entirety of the Site Boundary is in land zoned as Exclusive Farm Use. Only parcels within the city of Lexington are zoned as residential

TETRA TECH

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Figure K-8

Wheatridge Wind Energy Facility

Residential Zone Setback

- Minimum Project Impact -
GE 2.5-120 Project Facilities and Option 3 230kV Intraconnection Lines

Morrow and Umatilla Counties, OR
December 2014

Wheatridge West

Wheatridge East

Intraconnection Corridor

Umatilla County

Morrow County

Immigrant Ln
Baker Ln
Little Juniper Ln
Strawberry Ln
Crum Road
BaseLine Rd
Nichols Rd
Turner Ln
Kemp Ln
Beach Ln
Myers Ln
Bell Canyon Loop
Blackhorse Canyon Ln
Clarks Canyon Rd
Lexington
Wells Springs Rd
Bombing Range Rd
Ione-Boardman Rd
Bajak Martin Rd N
Juniper Canyon Rd
Lexington Grange Rd
Kilkenny Rd
Sand Hollow Rd
Dolyer Rd
Piper Canyon Rd
Butter Creek Rd
Big Butter Creek Ln
Little Butter Creek Rd
Spur Ln
207
74

Site Boundary
Residential Zone Setback (Site Boundary 3,520 foot Buffer)
County Boundary
State Highway
Local Road

Proposed Project Facilities

- Turbine
- Met Tower
- Intraconnection Lines (Option 3)
- Electrical Collector Line

Access Road

- New Road To Be Constructed
- Private Road To Be Improved
- O&M Facility
- Construction Yard

Substation

- Primary
- Alternate

Zoning *

- Farm Residential Zone
- Residential

* The entirety of the Site Boundary is in land zoned as Exclusive Farm Use. Only parcels within the city of Lexington are zoned as residential

1:140,000 WGS84 UTM 11

0 1 2 4 6 8 10 12 14 16 18 20 Miles

Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries / Morrow County: zoning / Umatilla County: zoning / USDA NAIP: background imagery

TETRA TECH

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Exhibit L

Protected Areas

Prepared for

Wheatridge Wind Energy, LLC

Wheatridge Wind Energy Facility

July 2015

Prepared by

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Terms and Definitions

Collector Line	An underground or overhead electrical 34.5 kV line transmitting power from the turbines to a Substation
Construction Yard	The temporary area for construction activities and Project component storage prior to installation
GE 1.7-103 Layout	Project turbine layout comprised of 292 GE 1.7MW turbines with 80m hub heights and 103m rotor diameters
GE 2.5-120 Layout	Project turbine layout comprised of 200 GE 2.5MW turbines with 85m hub heights and 120m rotor diameters
Gen-tie Line(s)	One or two 230 kV transmission line(s) conveying power from the Project to an interconnection point with the grid, which will be permitted and built by UEC or UEC/CB
Intraconnection Corridor	The intraconnection transmission line corridor connecting Wheatridge East with Wheatridge West
Intraconnection Line(s)	One or two overhead electrical 230 kV lines connecting the Project Substations in Wheatridge East and Wheatridge West.
Met Tower	Permanent meteorological tower
O&M Buildings	Permanent operations and maintenance buildings, including parking
Project	Wheatridge Wind Energy Facility
Site Access Road	Private road to be constructed or improved for the purpose of accessing turbines and associated Project facilities
Site Boundary	The boundary within which all Project facilities will be constructed, also known as the micrositing corridor
Substation	A facility in which electric power from the turbines is aggregated, stepped up in voltage, and connected to the Intraconnection Line(s) or the Gen-tie Line(s)
Turbine	A collective term for the foundation, tower, nacelle, blades and rotor that comprise a wind turbine generator in the Project
Turbine Pad	A cleared, graveled area around the base of each turbine encompassing primarily the turbine's foundation
Wheatridge	Wheatridge Wind Energy, LLC
Wheatridge East	The eastern group of turbines
Wheatridge West	The western group of turbines

Acronyms and Abbreviations

ACEC	Area of Critical Environmental Concern
BLM	Bureau of Land Management
BMP	Best Management Practices
dBA	A-weighted decibels
GIS	Geographic Information System
kV	kilovolt
MBTH	maximum blade tip height
MW	Megawatt
OAR	Oregon Administrative Rule
ODEQ	Oregon Department of Environmental Quality
OR-##	Oregon State Highway ##
RNA	Research Natural Area
VRM	Visual Resource Management
ZVI	zone of visual influence

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1.0 Introduction

Wheatridge Wind Energy, LLC (Wheatridge), proposes to construct the Wheatridge Wind Energy Facility (Project), a wind generation facility with a maximum nominal generating capacity of 500 megawatts (MW) in Morrow and Umatilla counties, Oregon (see Figures C-1 and C-2). The Project is comprised of up to 292 turbines divided into two groups: a western group of turbines (Wheatridge West) and an eastern group of turbines (Wheatridge East). Wheatridge West and Wheatridge East are electrically connected by an 'Intraconnection Corridor' containing up to two parallel overhead 230-kilovolt (kV) transmission lines (Intraconnection Lines), each no longer than 35 miles in length. Other Project components include access roads (Site Access Roads), an electrical collection and control system, the Project's substations (Substations), operations and maintenance buildings (O&M Buildings), and temporary construction yards (Construction Yards). These facilities are all described in greater detail in Exhibit B.

Wheatridge West is located entirely within Morrow County, approximately 5 miles northeast of Lexington, and approximately 7 miles northwest of Heppner. Wheatridge West is bisected by Oregon Highway 207 (OR-207). Wheatridge East is located approximately 16 miles northeast of Heppner and encompasses land in both Morrow and Umatilla counties. The Intraconnection Corridor is located entirely within Morrow County and adjoins to the southeastern portion of Wheatridge West and the southern portion of Wheatridge East.

Exhibit L provides an analysis of the Project impacts to protected areas, as required to meet the submittal requirements of Oregon Administrative Rule (OAR) 345-021-0010 (1)(l) paragraphs (A) through (C). This Exhibit demonstrates that the Project can comply with the approval standard in OAR 345-022-0040:

> ***345-022-0040 Protected Areas***
>
> *(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:*
>
> > *(a) National parks, including but not limited to Crater Lake National Park and Fort Clatsop National Memorial;*
> >
> > *(b) National monuments, including but not limited to John Day Fossil Bed National Monument, Newberry National Volcanic Monument and Oregon Caves National Monument;*
> >
> > *(c) Wilderness areas established pursuant to The Wilderness Act, 16 U.S.C. 1131 et seq. and areas recommended for designation as wilderness areas pursuant to 43 U.S.C. 1782;*

(d) National and state wildlife refuges, including but not limited to Ankeny, Bandon Marsh, Baskett Slough, Bear Valley, Cape Meares, Cold Springs, Deer Flat, Hart Mountain, Julia Butler Hansen, Klamath Forest, Lewis and Clark, Lower Klamath, Malheur, McKay Creek, Oregon Islands, Sheldon, Three Arch Rocks, Umatilla, Upper Klamath, and William L. Finley;

(e) National coordination areas, including but not limited to Government Island, Ochoco and Summer Lake;

(f) National and state fish hatcheries, including but not limited to Eagle Creek and Warm Springs;

(g) National recreation and scenic areas, including but not limited to Oregon Dunes National Recreation Area, Hell's Canyon National Recreation Area, and the Oregon Cascades Recreation Area, and Columbia River Gorge National Scenic Area;

(h) State parks and waysides as listed by the Oregon Department of Parks and Recreation and the Willamette River Greenway;

(i) State natural heritage areas listed in the Oregon Register of Natural Heritage Areas pursuant to ORS 273.581;

(j) State estuarine sanctuaries, including but not limited to South Slough Estuarine Sanctuary, OAR chapter 142;

(k) Scenic waterways designated pursuant to ORS 390.826, wild or scenic rivers designated pursuant to 16 U.S.C. 1271 et seq., and those waterways and rivers listed as potentials for designation;

(l) Experimental areas established by the Rangeland Resources Program, College of Agriculture, Oregon State University: the Prineville site, the Burns (Squaw Butte) site, the Starkey site and the Union site;

(m) Agricultural experimental stations established by the College of Agriculture, Oregon State University, including but not limited to:

…

Agriculture Research and Extension Center, Hermiston…;

(n) Research forests established by the College of Forestry, Oregon State University, including but not limited to McDonald Forest, Paul M. Dunn Forest, the Blodgett Tract in Columbia County, the Spaulding Tract in the Mary's Peak area and the Marchel Tract;

(o) Bureau of Land Management areas of critical environmental concern, outstanding natural areas and research natural areas;

(p) State wildlife areas and management areas identified in OAR chapter 635, division 8.

2.0 Analysis Area

The analysis area for protected areas is defined in the Project Order as "the area within the Site Boundary and 20 miles from the Site Boundary." The Site Boundary is defined in detail in Exhibits B and C. The analysis area is shown on Figure L-1.

3.0 Protected Areas Inventory

Tables L-1 and L-2 provide an inventory of the 16 protected areas within the analysis area, and indicates the proximity and direction of each protected area relative to the Site Boundary. No protected areas are located within the Site Boundary. The inventory of protected areas was based on review of available Geographic Information System (GIS) data, maps, and other available information for the categories of protected areas listed in OAR 345-022-0040(1). These protected areas are identified by name on Figure L-1.

4.0 Potential Impacts

OAR 345-021-0010(1)(l)(C) calls for "A description of significant potential impacts of the proposed facility, if any, on the protected areas including, but not limited to, potential impacts such as:

(i) Noise resulting from facility construction or operation;

(ii) Increased traffic resulting from facility construction or operation;

(iii) Water use during facility construction or operation;

(iv) Wastewater disposal resulting from facility construction or operation;

(v) Visual impacts of facility structures or plumes."

The following sections discuss potential impacts to protected areas.

4.1 Noise Impacts

Tables L-1 and L-2 provide a summary of operational noise levels at protected areas within the analysis area, for both the GE 1.7-103 and GE 2.5-120 turbine layouts. Exhibit X provides an assessment of the existing acoustical environment and anticipated Project sound levels, the methodology for noise modeling is discussed in detail in that Exhibit. As noted in Exhibit X, sound generated by an operating turbine includes both mechanical sound and aerodynamic sound. The dominant noise component for wind farms is aerodynamic sound, which refers to the sound produced by air flow around the turbine blades and the tower.

Based on the results of noise reduced operations (NRO) modeling, described in detail in exhibit X, Project turbine noise would attenuate to below 26 A-weighted decibels (dBA), and would be indistinguishable from the background noise level, within a distance of approximately 2 miles from

the Site Boundary. All protected areas except for one, the Lindsay Prairie Preserve, are located more than 2 miles from the Site Boundary where noise from the Project would be effectively inaudible; it would not rise above the assumed 26 dBA ambient background noise level.

At Lindsay Prairie Preserve, the worst-case modeled noise level in NRO mode would be approximately 36 to 54 dBA; at the loudest this is approximately equivalent to the sound level of a normal conversation. Operational Project noise at Lindsay Prairie Preserve would be only marginally lower (1 dBA) for the GE 2.5-120 turbine layout than for the GE 1.7-103 turbine layout.

Exhibit X describes sound level thresholds derived from the Oregon Department of Environmental Quality (ODEQ) noise regulations (OAR 340-035-0035), which are used to assess the significance of impacts to noise sensitive properties. As defined in the ODEQ regulations, "Noise sensitive property" is defined as "real property normally used for sleeping, or normally used as schools, churches, hospitals or public libraries. Property used in industrial or agricultural activities is not Noise Sensitive Property unless it meets the above criteria in more than an incidental manner." The Lindsay Prairie Preserve is not an area normally used for sleeping (which is also true of all of the other protected areas) and has minimal daytime use, so is not considered noise sensitive property; the ODEQ noise regulations therefore do not apply. OAR 340-035-0035(5)(g) specifically exempts noise emanating from construction activities from compliance with the state noise regulations.

Although sound from the Project turbines would be audible within the Lindsay Prairie Preserve, the limited use of the area indicates that it would not be considered a significant noise impact. The primary users of the site are occasional staff members of The Nature Conservancy (TNC; the managing conservation agency) and volunteers conducting environmental monitoring or maintenance activities. Although the site is open to the public, the Preserve is fenced, the access road gated and locked, and there are no developed facilities of any kind; camping is prohibited, and there are no trails. TNC indicates that it receives no known public use and is only occasionally visited by TNC staff (personal communication between Thomas Kruger, Tetra Tech, and Jeff Rosier, TNC, March 9 2015). Audible noise would not interfere with the primary purpose of the site, which is the preservation of a remnant tract of native grassland and wildlife that utilize the habitat.

Construction noise would also be audible within the Lindsay Prairie Preserve, while work occurs on the portions of the Project nearest the protected area. Based on the estimated noise levels of construction equipment provided in Exhibit X, construction noise levels within the Preserve are likely to peak at approximately 55 dBA. This elevated noise level is likely to last only a 3 to 4 weeks, while the access roads and turbines in the northern end of Wheatridge West closest to the Preserve are built; as construction progresses away from the Preserve, noise levels would drop. Construction activities farther than about a mile away would be virtually inaudible, due to both distance attenuation and shielding by terrain. However, as noted above, the Preserve receives little to no public use and is infrequently visited by TNC staff, so there are few, infrequent users to be affected by construction noise. Construction noise would also not interfere with the primary purpose of the Preserve: to restore and preserve native grassland habitat. Lindsay Prairie Preserve is also subject to noise from other sources, notably a County rock quarry located on the opposite side of Juniper Canyon Road.

4.2 Traffic Impacts

Traffic impacts are addressed in greater detail in Exhibit U, which provides additional information on anticipated traffic volumes, peak construction traffic times, potential delays and temporary road closures; mitigation measures that would be implemented by Wheatridge and the construction contractor to avoid significant traffic impacts; and required coordination with Oregon Department of Transportation and county road officials for necessary road improvements, road closures, and permits for construction and oversized load movements.

No significant traffic impacts to protected areas are anticipated from the Project. All but five of the protected areas are located north of I-84 and would be virtually unaffected by Project traffic, which would be concentrated on a small number of roads south of I-84. No truck traffic associated with the Project would occur north of I-84, and construction worker traffic would be dispersed on many roads in the area, rather than concentrated on any one road such that access to any protected area north of the interstate could be adversely affected. Of the five protected areas south of I-84, only the Boardman Research Natural Area (RNA) and Lindsay Prairie Preserve are likely to experience impacts from Project traffic; the Willow Creek Wildlife Management Area, Horn Butte Area of Critical Environmental Concern (ACEC) and the Oregon Trail ACEC are accessed by routes that would not carry Project-related truck traffic. Construction worker traffic may occur on roads providing access to these areas; however construction worker traffic would be dispersed on many roads in the area, and the level of worker traffic anticipated would not adversely affect Level of Service on those roads (see Exhibit U).

Because they are accessed by roads that would also carry Project construction traffic (specifically Bombing Range Road and Juniper Road), the Boardman RNA and Lindsay Prairie Preserve may experience access disruptions or delays for brief periods due to delivery of Project materials or construction equipment. These impacts will be intermittent and temporary, and traffic levels would return to normal following construction. However, as noted above neither of these protected areas experience significant public usage and are visited infrequently by management staff, so there are few users to be affected by construction traffic. No roads providing access to protected areas are expected to be closed during construction or operation of the Project. During construction, Best Management Practices (BMPs) as detailed in Exhibit U, Section 3.5.4 will ensure that access restrictions to any protected area will be temporary and timed to avoid peak traffic flow.

The operational phase of the Project will not generate amounts of traffic that could adversely impact protected areas. Operation of the Project is expected to employee between 10 and 20 individuals, See Exhibit U, Section 3.5.1.2. Therefore, there will be no significant impacts to protected areas due to Project traffic.

4.3 Water Use and Wastewater

No significant water or wastewater impacts to protected areas are anticipated from the Project. During construction, water will acquired from licensed sources in the vicinity of the Project and transported to construction areas; this is part of the traffic impact discussed above and in Exhibit U. No ground or surface water withdrawals will take place for construction of the Project beyond

those already permitted for existing water suppliers. During operation, the Project would have minimal water needs that would be fulfilled through the use of exempt wells at the O&M Buildings. Water used during Project construction or operation would not impact water availability or use at protected areas.

Wastewater, in this context, refers to stormwater runoff and to sanitation wastewater; no industrial wastewater would be produced during construction or operation of the Project. Stormwater runoff will be managed on site according to the BMPs as described in the NPDES 1200-C / Erosion and Sediment Control Plan (Exhibit I, Attachment I-2), such that no stormwater will leave the Site Boundary. No protected area would be affected by stormwater runoff from the Project Area. Sanitation wastewater during construction would be contained in portable toilets, to be provided and maintained by a licensed contractor. Wastewater generated at the O&M Buildings during Project operation will be handled by an on-site septic system, to be permitted prior to construction. No protected area would be impacted by sanitation wastewater related to the Project. Exhibit O provides additional information on water use and Exhibit V provides information on wastewater.

There will be no significant impacts to protected areas due to water use at the Project.

4.4 Visual Impacts

Visual impacts would include views of the turbines, Intraconnection Line(s), and other Project facilities such as O&M Buildings and substations. OAR 345-021-0010(1)(l)(C)(vi) requires an assessment of "Visual impacts from air emissions resulting from facility construction or operation, including, but not limited to, impacts on Class I Areas as described in OAR 340-204-0050." Class I areas, as defined in OAR 340-204-0050, consist of the 12 federally-designated Wilderness Areas in Oregon; none of which are located within the analysis area.

The Project would not generate any emissions plumes, so would not cause any visual impacts from air emissions. Potential visual impacts due to dust created during construction of the Project will be largely prevented by following BMPs for dust control as detailed in Exhibit O, section 2.1.1.

Visual impacts of the Project are primarily related to views of the turbines, and to a lesser degree, other facilities such as the Intraconnection Line(s), Site Access Roads, O&M Buildings and substations. In evaluating the visual impacts, Wheatridge first determined whether the Project would be visible from each protected area using digital bare earth modeling. The analysis began with a zone of visual influence (ZVI) analysis (also known as a viewshed or visibility analysis), using Environmental Systems Research Institute (ESRI) ArcGIS software to identify the areas from which the proposed Project turbines might be visible. To assess the potential visibility of the structures, the ZVI analysis was performed for the GE 1.7-103 (Figure L-2) and GE 2.5-120 (Figure L-3) turbine layouts assuming 110% maximum blade tip height (MBTH). This resulted in an assumed turbine MBTH of 144 meters (472 feet) for the GE 1.7-103 turbines and 160 meters (525 feet) for the GE 2.5-120 turbines.

It should be noted that this "bare-earth" modeling approach, based only on the effects of terrain on visibility, results in a highly conservative assessment of potential visibility for several reasons. First,

in some areas where the analysis indicates Project structures would be visible, the only visible components might be the tips of the turbine blades at MBTH, which would likely be noticeable only at relatively close viewing distances. In addition, the model does not account for distance, lighting, weather, and atmospheric attenuation factors that diminish visibility under actual field conditions. A bare-earth analysis also does not take into account the effects of vegetation or buildings, which will in practice block or screen views in some places. Finally, the use of turbine heights in the model that are 10% greater than the actual height overstates likely visibility. Figures L-2 and L-3 show the areas from which the turbines would likely be visible, for the GE 1.7-103 and GE 2.5-120 layouts respectively; the number of turbines potentially visible is indicated by color-coding on those figures.

Based on the results of the ZVI analysis, there would be visibility of some portions of the Project from all 16 protected areas in the analysis area (see Table L-1 and L-2). Visibility is characterized as minimal (fewer than 20 turbines potentially visible), low (20 to 50 turbines visible), moderate (50 to 150 turbines visible), or good (more than 150 turbines potentially visible). In some protected areas, visibility is characterized as limited, meaning that there would be no views of the Project from a substantial portion of the protected area.

Potential visibility is but one of several factors that comprise an assessment of visual impact to a protected area. Other factors to consider include the viewing distance; other natural and manmade features visible within the view; the likely number and nature of visitors to a protected area; and whether there is any management direction related to preservation of scenic quality, either within the protected area or outside of it. Tables L-1 and L-2 provide a summary of the visual impact assessment for each of the 16 protected areas, for the GE 1.7-103 and GE2.5-120 turbine layouts, respectively.

The visual impact is considered to be negligible for most protected areas, primarily due to their distance of 9 to 20 miles from the Site Boundary. Views of the Project turbines for most protected areas would therefore be at a background viewing distance where the apparent size of the turbines is greatly diminished, and the turbines would occupy a limited portion of the total viewshed. Many of the protected areas currently have views of other wind farms, transmission lines, and urban and industrial development so the Project would not introduce a new or unusual feature to the view. In addition, potential Project views from some of the protected areas would be partially to fully screened by vegetation.

Three of the protected areas closest to the Project would have foreground to middleground views of the Project. These areas are the Boardman RNA, the Lindsay Prairie Preserve, and the Oregon Trail ACEC. The following paragraphs provide a more in-depth visual impact assessment for these three protected areas.

Boardman RNA

At the Boardman RNA, the anticipated visual impact is considered to be low to negligible. The visibility analysis indicates good Project visibility at a middleground viewing distance in a viewshed with few existing nearby substantial vertical structures, but with views that include

existing transmission lines and wind farms in the background. However, the RNA is located entirely within the Boardman Bombing Range, and thus is not accessible to the public. The site is protected for preservation of native vegetation and wildlife, and is visited only occasionally by The Nature Conservancy (TNC) staff doing monitoring or maintenance activities (personal communication between Thomas Kruger, Tetra Tech, and Jeff Rosier, TNC, March 9 2015). Views of the Project would not compromise the purpose of the RNA, and would affect few users for a short duration. Additionally, the site is not managed for its scenic qualities, except as related to vegetation within the site; views of the Project would not interfere with this purpose.

Lindsay Prairie Preserve

At the Lindsay Prairie Preserve the visual impact of the Project is considered to be low. The visibility analysis indicates good visibility of the Project turbines at close viewing distance, and in several directions. Although the turbines would occupy a substantial amount of the viewing angle, and there are few existing structures visible from the preserve, there are very few users to be affected. The Preserve is fenced, the access gated and locked, and there are no facilities of any kind. Although the site is open to the public, TNC reports that it receives no known public use and is only occasionally visited by TNC staff (personal communication between Thomas Kruger, Tetra Tech, and Jeff Rosier, TNC, March 9 2015). Views of the Project would not compromise the purpose of the Preserve, and would affect few users for a short duration. Additionally, the site is not managed for its scenic qualities, except as related to vegetation within the site; views of the Project would not interfere with this purpose.

Oregon Trail ACEC, Echo Meadows

The Oregon Trail ACEC is located approximately 2.7 miles north of Wheatridge East; this site is also known as Echo Meadows. It is a 320 acre parcel managed by the BLM for preservation and enjoyment of the remaining evidence of the Oregon Trail. Visitors can hike along a paved trail to see nearly one mile of intact wagon ruts, and read interpretive signs about the area and its history. The visibility analysis indicates moderate Project visibility at middleground to background viewing distance; views would include existing wind turbines, power lines and agricultural irrigation equipment. This site receives fairly low levels of public use, up to an estimated maximum of about 650 visitors per year (personal communication between Thomas Kruger, Tetra Tech, and Kevin McCoy, BLM Vale District, Baker Office, March 9, 2015). The site is managed to preserve scenic quality under the BLM Visual Resource Management system; however, the VRM system applies only to actions that occur within the boundaries of the site, and does not apply outside the boundaries of BLM ownership. There are no designated views or viewsheds associated with this ACEC. Therefore, there is no management direction applicable to preservation of scenic qualities outside of the ACEC. Views of turbines would neither interfere with the enjoyment of nor compromise the integrity of the remaining evidence of the Oregon Trail at this site.

Based on this analysis, Wheatridge concludes that there would be no significant visual impacts to protected areas within the analysis area. While all of the protected areas would have some level of

Project visibility, for most protected areas the Project would be in the background, and the turbines would not represent a new or unusual feature in the landscape because there are already wind turbines visible. For the three closest protected areas that would have foreground to middleground views of the Project turbines, the resulting impact is more closely related to the use and management direction than to views of the turbines. The Boardman RNA is effectively off-limits to the public, and Lindsay Prairie is accessible but receives negligible public use; views of the turbines from these two areas would affect very few users and would not interfere with the purpose of either area. Similarly, the Oregon Trail ACEC, Echo Meadows site receives a low level of public use, and views of the turbines would not interfere with the purpose for which this site is preserved. Only a few of the protected areas have any management direction related to scenic quality, and that direction does not apply to siting of the Project outside of the protected areas. Additionally, views from most of the protected areas already include wind turbines, transmission lines, and other industrial infrastructure or urbanized areas, indicating that viewers cannot reasonably expect pristine views free of wind turbines.

4.5 Other Impacts

No other impacts to protected areas are anticipated.

5.0 Conclusions

The Project analysis area contains all or part of 16 protected areas. Wheatridge analyzed potential impacts to these areas and concluded as follows:

- Noise. Based on the results of the noise modeling presented in Exhibit X, operational noise was determined to likely be less than 26 dBA, which is consistent with a rural background ambient according to OAR 340-035-0035, at 15 of the 16 protected areas within the analysis area. At the final protected area, Lindsay Prairie Preserve, the operational Project noise level is modeled to be 36 to 54 dBA, depending on location within the preserve, and would not be substantially different for the two turbine layouts. This site is not considered a noise sensitive receptor, and audible noise would not interfere with the primary purpose of the site, which is the preservation of a remnant tract of native grassland. Construction noise may be audible in some protected areas nearest the Project; however, construction noise would be short-term and intermittent, and would not be considered a significant impact to any protected area.
- Traffic. Project-related traffic would not be sufficiently high, nor located so as to significantly impact any protected areas. Some short-term, intermittent and temporary delays may be experienced during Project construction by visitors attempting to reach some of the protected areas; however, these would be temporary and traffic conditions would return to typical low levels following construction. Therefore, there would be no significant impact to traffic resulting from the operation of the Project.

- Water. The Project would not use water in sufficient quantities or from sources that would significantly impact any protected areas. Therefore, there would be no significant impacts to protected areas by water use at the Project.
- Wastewater. The Project would manage its very limited quantities of wastewater on-site and would thus not significantly impact any protected areas. Therefore, there would be no significant impacts to protected areas due to wastewater generated at the Project.
- Visual. The Project would potentially be visible from all 16 protected areas in the analysis area. However, due to distance from the Project, other features within view, low user numbers at the nearest sites, and an overall lack of management direction applicable to scenic quality beyond the boundaries of each protected area, the Project would not have a significant visual impact on any protected area. The visual impact assessment results are not substantively different for the two turbine layouts.

Table L-1. Protected Areas Inventory, Visual and Noise Assessment Results (GE 1.7-103 Layout)

Protected Areas within 20 Miles of Site Boundary		Distance to Site Boundary (miles)	Direction from Project	Project Potentially Visible? 1/	Visual Analysis Results	Operational Noise Potentially Audible?	Worst-case Modeled Operational Noise Level (dBA L_{50})
Type	**Area Name**						
National Parks OAR 345-022-0040(1)(a)	None	N/A	N/A	N/A	N/A	N/A	N/A
National Monuments OAR 345-022-0040(1)(b)	None	N/A	N/A	N/A	N/A	N/A	N/A
Wilderness Areas OAR 345-022-0040(1)(c)	None	N/A	N/A	N/A	N/A	N/A	N/A
National & State Wildlife Refuges OAR 345-022-0040(1)(d)	Umatilla National Wildlife Refuge	14	NNW	Yes	Negligible Impact. Viewshed analysis indicates good potential Project visibility, but a far background viewing distance of over 14 miles, vegetative screening within the NWR that limits Project visibility, and views across developed industrial uses and highways indicate that the turbines would not be a prominent feature in the viewshed. Views of the Project would not interfere with designated wildlife viewing locations. No management direction applicable to preservation of scenic qualities outside of Refuge; views of the Project would not compromise the purpose of the Refuge.	No	<26
	Cold Springs National Wildlife Refuge	13	NE	Yes	Negligible Impact. Viewshed analysis indicates good potential Project visibility in NWR; however, a far background viewing distance of over 13 miles, vegetative screening in portions of the NWR, and views across developed areas and highways indicate that the turbines would not be a prominent feature in the viewshed. Views of the Project would not interfere with designated wildlife viewing locations. No management direction applicable to preservation of scenic qualities outside of Refuge; views of the Project would not compromise the purpose of the Refuge.	No	<26
	McNary National Wildlife Refuge	18	NE	Yes	Negligible Impact. Viewshed analysis indicates minimal and limited Project visibility in NWR at a distance of over 18 miles; if Project is visible, the far background viewing distance, vegetative screening within the NWR, and views across developed industrial uses and highways indicate that the turbines would not be a prominent feature in the viewshed. Views of the Project would not interfere with designated wildlife viewing locations. No management direction applicable to preservation of scenic qualities outside of Refuge; views of the Project would not compromise the purpose of the Refuge.	No	<26
National Coordination Areas OAR 345-022-0040(1)(e)	None	N/A	N/A	N/A	N/A	N/A	N/A
Fish Hatcheries OAR 345-022-0040(1)(f)	Umatilla Hatchery	20	N	Yes	Negligible Impact. Viewshed analysis indicates good Project visibility; however, a long viewing distance of over 20 miles and views across developed industrial uses and highways render an overall low visual impact. No management direction applicable to scenic quality, and views of the Project would not compromise the purpose of facility.	No	<26

Table L-1. Protected Areas Inventory, Visual and Noise Assessment Results (GE 1.7-103 Layout)

Protected Areas within 20 Miles of Site Boundary		Distance to Site Boundary (miles)	Direction from Project	Project Potentially Visible? 1/	Visual Analysis Results	Operational Noise Potentially Audible?	Worst-case Modeled Operational Noise Level (dBA L_{50})
Type	**Area Name**						
	Irrigon Hatchery	17.5	N	Yes	Negligible Impact. Viewshed analysis indicates minimal Project visibility that may be partially screened by vegetation; however, a long viewing distance of over 17.5 miles, across an urbanized area renders an overall low visual impact. No management direction applicable to scenic quality, and views of the Project would not compromise the purpose of facility.	No	<26
	Three Mile Adult Hold Fish Hatchery	13.5	N	Yes	Negligible Impact. Viewshed analysis indicates limited Project visibility at a distance of over 13.5 miles; if visible, long viewing distance and views across an urbanized area and highways render an overall low visual impact. No management direction applicable to scenic quality, and views of the Project would not compromise the purpose of facility.	No	<26
National Recreation and Scenic Areas OAR 345-022-0040(1)(g)	None	N/A	N/A	N/A	N/A	N/A	N/A
State Parks & Waysides OAR 345-022-0040(1)(h)	Hat Rock State Park	16.5	NE	Yes	Negligible Impact. Viewshed analysis indicates limited visibility of Project ranging from none to good depending on location; however, a far background viewing distance of over 16.5 miles, and views toward the Project that include existing transmission lines, highways and urbanized areas indicate that the turbines would not be a prominent feature in the viewshed, if visible at all. The turbines may be visible only from high ground in the park, and would not be visible from developed use areas. The direction of the Project from the park indicates that the turbines are unlikely to feature in views of Hat Rock from common vantage points in the park. .	No	<26
State Natural Heritage Areas OAR 345-022-0040(1)(i)	Lindsay Prairie Preserve	0	W	Yes	Low impact. Viewshed analysis indicates good visibility of turbines at close viewing distance. The Preserve is fenced, gated and locked and has no developed facilities; although it is publicly accessible, it receives very little public use. The site is protected for preservation of native vegetation and wildlife, and there is no management direction related to scenic quality except as related to vegetation within the site; views of the turbines would not compromise the purpose of the Preserve. 2/	YES	54
State Estuarine Sanctuaries OAR 345-022-0040(1)(j)	None	N/A	N/A	N/A	N/A	N/A	N/A
Scenic Waterways/ Wild & Scenic Rivers OAR 345-022-0040(1)(k)	None	N/A	N/A	N/A	N/A	N/A	N/A
Experimental Areas (Rangeland Resources Program) OAR 345-022-0040(1)(l)	None	N/A	N/A	N/A	N/A	N/A	N/A
Agricultural Experimental Stations OAR 345-022-0040(1)(m)	Oregon State University Agriculture Research and Extension Center, Hermiston	9	N	Yes	Negligible Impact. Viewshed analysis indicates good Project visibility; however, a background viewing distance of over 9 miles, and views in context with existing urban/industrial development, highway and an existing wind farm indicate that the turbines would not be a prominent feature in the viewshed. No management direction applicable to scenic quality, and views of the Project would not compromise the purpose of facility.	No	<26

Table L-1. Protected Areas Inventory, Visual and Noise Assessment Results (GE 1.7-103 Layout)

Protected Areas within 20 Miles of Site Boundary		Distance to Site Boundary (miles)	Direction from Project	Project Potentially Visible? [1/]	Visual Analysis Results	Operational Noise Potentially Audible?	Worst-case Modeled Operational Noise Level (dBA L_{50})
Type	**Area Name**						
Research Forests OAR 345-022-0040(1)(n)	None	N/A	N/A	N/A	N/A	N/A	N/A
BLM Areas of Critical Environmental Concern OAR 345-022-0040(1)(o)	Oregon Trail ACEC	2.7	N	Yes	Low impact. Viewshed analysis indicates moderate Project visibility at middleground to background viewing distance; views would include existing wind turbines, power lines and agricultural irrigation equipment. This site receives low levels of public use, up to a maximum of about 650 visitors per year. No management direction applicable to preservation of scenic qualities outside of ACEC. Views of turbines would not compromise the integrity of the remaining evidence of the Oregon Trail at this site. [3/]	No	<26
	Horn Butte Curlew ACEC	15	NW	Yes	Negligible Impact. Viewshed analysis indicates good Project visibility; however, a far background viewing distance of over 15 miles and views of other existing wind farms in the area indicate that the Project turbines would not represent a new or unusual feature in the viewshed, and would not be a prominent feature in the viewshed from the ACEC. . No management direction applicable to preservation of scenic qualities outside of ACEC and views of the Project would not compromise the purpose of the ACEC.	No	<26
BLM Research Natural Areas and Outstanding Natural Areas OAR 345-022-0040(1)(o)	Boardman RNA	2.3	NNW	Yes	Low impact. Viewshed analysis indicates moderate Project visibility at middleground to background viewing distance; views would include existing wind turbines, power lines and agricultural irrigation equipment. This site receives low levels of public use, up to a maximum of about 650 visitors per year. No management direction applicable to preservation of scenic qualities outside of ACEC. Views of turbines would not compromise the integrity of the remaining evidence of the Oregon Trail at this site. [3/]	No	<26
State Wildlife Areas and Management Areas OAR 345-022-0040(1)(p)	Irrigon Wildlife Management Area	16.5	N	Yes	Negligible Impact. Viewshed analysis indicates limited Project visibility; the Project turbines may be visible only from a small area at the far eastern end of the WMA. The far background viewing distance of over 16.5 miles, likely screening of views by existing vegetation, and views of the Project that would include other industrial and urbanized areas indicate that the turbines would not represent an unusual feature in the viewshed, and would not be prominent. No management direction applicable to scenic quality; views of the Project would not interfere with wildlife viewing or compromise the purpose of the WMA.	No	<26
	Power City Wildlife Management Area	14.5	N	Yes	Negligible Impact. Viewshed analysis indicates limited Project visibility due to terrain screening; the turbines may be visible only in the northeastern quarter of the WMA, in an area where there are no developed use facilities and no apparent trails. The far background viewing distance of over 14.5 miles and views of the Project that would include other industrial and urbanized areas indicate that the turbines would not represent an unusual feature in the viewshed, and would not be prominent.. No management direction applicable to scenic quality; views of the Project would not interfere with wildlife viewing or compromise the purpose of the WMA.	No	<26

Table L-1. Protected Areas Inventory, Visual and Noise Assessment Results (GE 1.7-103 Layout)							
Protected Areas within 20 Miles of Site Boundary		**Distance to Site Boundary (miles)**	**Direction from Project**	**Project Potentially Visible? 1/**	**Visual Analysis Results**	**Operational Noise Potentially Audible?**	**Worst-case Modeled Operational Noise Level (dBA L_{50})**
Type	**Area Name**						
	Coyote Springs Wildlife Management Area	14	N	Yes	Negligible Impact. Viewshed analysis indicates good Project visibility; however, the far background viewing distance of over 14 miles and views in context with existing urban/industrial development, highway and existing wind farm, indicate that the turbines would not represent an unusual feature in the viewshed, and would not be prominent. No management direction applicable to scenic quality; views of the Project would not interfere with wildlife viewing or compromise the purpose of the WMA.	No	<26
	Willow Creek Wildlife Management Area	18	NW	Yes	Negligible. Viewshed analysis indicates limited Project visibility; the Project would not be visible from the surface of the Willow Creek or any developed use area. From locations where the Project may be visible, the far background viewing distance of over 18 miles, and existing views that include existing energy infrastructure and highways, indicate that the turbines would not represent an unusual feature in the viewshed, and would not be prominent. No management direction applicable to scenic quality; views of the Project would not interfere with wildlife viewing or compromise the purpose of the WMA.	No	<26

1/ Indicates potential visibility of any part of wind turbine(s), Intraconnection Line(s), or other Project facilities as determined through viewshed analysis.
2/ Information on access and use obtained through a personal communication between Thomas Kruger, Tetra Tech and Jeff Rosier, The Nature Conservancy, March 9, 2015.
3/ Use data for the Oregon Trail Echo Meadows ACEC obtained through a personal communication between Thomas Kruger, Tetra Tech, and Kevin McCoy, BLM Vale District, Baker Office, March 9, 2015.

Table L-2. Protected Areas Inventory, Visual and Noise Assessment Results (GE 2.5-120 Layout)							
Protected Areas within 20 Miles of Site Boundary		**Distance to Site Boundary (miles)**	**Direction from Project**	**Project Potentially Visible? 1/**	**Visual Analysis Results**	**Operational Noise Potentially Audible?**	**Worst-case Modeled Operational Noise Level (dBA L_{50})**
Type	**Area Name**						
National Parks OAR 345-022-0040(1)(a)	None	N/A	N/A	N/A	N/A	N/A	N/A
National Monuments OAR 345-022-0040(1)(b)	None	N/A	N/A	N/A	N/A	N/A	N/A
Wilderness Areas OAR 345-022-0040(1)(c)	None	N/A	N/A	N/A	N/A	N/A	N/A

Table L-2. Protected Areas Inventory, Visual and Noise Assessment Results (GE 2.5-120 Layout)

Protected Areas within 20 Miles of Site Boundary		Distance to Site Boundary (miles)	Direction from Project	Project Potentially Visible? 1/	Visual Analysis Results	Operational Noise Potentially Audible?	Worst-case Modeled Operational Noise Level (dBA L_{50})
Type	**Area Name**						
National & State Wildlife Refuges OAR 345-022-0040(1)(d)	Umatilla National Wildlife Refuge	14	NNW	YES	Negligible Impact. Viewshed analysis indicates good potential Project visibility, but a far background viewing distance of over 14 miles, vegetative screening within the NWR that limits Project visibility, and views across developed industrial uses and highways indicate that the turbines would not be a prominent feature in the viewshed. Views of the Project would not interfere with designated wildlife viewing locations. No management direction applicable to preservation of scenic qualities outside of Refuge; views of the Project would not compromise the purpose of the Refuge.	No	<26
	Cold Springs National Wildlife Refuge	13	NE	YES	Negligible Impact. Viewshed analysis indicates good potential Project visibility in NWR; however, a far background viewing distance of over 13 miles, vegetative screening in portions of the NWR, and views across developed areas and highways indicate that the turbines would not be a prominent feature in the viewshed. Views of the Project would not interfere with designated wildlife viewing locations. No management direction applicable to preservation of scenic qualities outside of Refuge; views of the Project would not compromise the purpose of the Refuge.	No	N/A
	McNary National Wildlife Refuge	18	NE	YES	Negligible Impact. Viewshed analysis indicates minimal and limited Project visibility in NWR at a distance of over 18 miles; if Project is visible, the far background viewing distance, vegetative screening within the NWR, and views across developed industrial uses and highways indicate that the turbines would not be a prominent feature in the viewshed. Views of the Project would not interfere with designated wildlife viewing locations. No management direction applicable to preservation of scenic qualities outside of Refuge; views of the Project would not compromise the purpose of the Refuge.	No	<26
National Coordination Areas OAR 345-022-0040(1)(e)	None	N/A	N/A	N/A	N/A	N/A	N/A
Fish Hatcheries OAR 345-022-0040(1)(f)	Umatilla Hatchery	20	N	YES	Negligible Impact. Viewshed analysis indicates good Project visibility; however, long viewing distance of over 20 miles and views across developed industrial uses and highways render an overall low visual impact. No management direction applicable to scenic quality, and views of the Project would not compromise the purpose of facility.	No	<26
	Irrigon Hatchery	17.5	N	YES	Negligible Impact. Viewshed analysis indicates minimal Project visibility that may be partially screened by vegetation; however, long viewing distance of over 17.5 miles, across an urbanized area render an overall low visual impact. No management direction applicable to scenic quality, and views of the Project would not compromise the purpose of facility.	No	<26
	Three Mile Adult Hold Fish Hatchery	13.5	N	YES	Negligible Impact. Viewshed analysis indicates limited Project visibility at a distance of over 13.5 miles; if visible, long viewing distance and views across an urbanized area and highways render an overall low visual impact. No management direction applicable to scenic quality, and views of the Project would not compromise the purpose of facility.	No	<26

Table L-2. Protected Areas Inventory, Visual and Noise Assessment Results (GE 2.5-120 Layout)

Protected Areas within 20 Miles of Site Boundary		Distance to Site Boundary (miles)	Direction from Project	Project Potentially Visible? 1/	Visual Analysis Results	Operational Noise Potentially Audible?	Worst-case Modeled Operational Noise Level (dBA L_{50})
Type	**Area Name**						
National Recreation and Scenic Areas OAR 345-022-0040(1)(g)	None	N/A	N/A	N/A	N/A	N/A	N/A
State Parks & Waysides OAR 345-022-0040(1)(h)	Hat Rock State Park	16.5	NE	YES	Negligible Impact. Viewshed analysis indicates limited visibility of Project ranging from none to good depending on location; however, a far background viewing distance of over 16.5 miles, and views toward the Project that include existing transmission lines, highways and urbanized areas indicate that the turbines would not be a prominent feature in the viewshed, if visible at all. The turbines may be visible only from high ground in the park, and would not be visible from developed use areas. The direction of the Project from the park indicates that the turbines are unlikely to feature in views of Hat Rock from common vantage points in the park. .	No	<26
State Natural Heritage Areas OAR 345-022-0040(1)(i)	Lindsay Prairie Preserve	0	W	YES	Low impact. Viewshed analysis indicates good visibility of turbines at close viewing distance. The Preserve is fenced, gated and locked and has no developed facilities; although it is publicly accessible it receives very little public use. The site is protected for preservation of native vegetation and wildlife, and there is no management direction related to scenic quality except as related to vegetation within the site; views of the turbines would not compromise the purpose of the Preserve. 2/	Yes	54
State Estuarine Sanctuaries OAR 345-022-0040(1)(j)	None	N/A	N/A	N/A	N/A	N/A	N/A
Scenic Waterways/ Wild & Scenic Rivers OAR 345-022-0040(1)(k)	None	N/A	N/A	N/A	N/A	N/A	N/A
Experimental Areas (Rangeland Resources Program) OAR 345-022-0040(1)(l)	None	N/A	N/A	N/A	N/A	N/A	N/A
Agricultural Experimental Stations OAR 345-022-0040(1)(m)	Agriculture Research and Extension Center, Hermiston	9	N	YES	Negligible Impact. Viewshed analysis indicates good Project visibility; however, a background viewing distance of over 9 miles, and views in context with existing urban/industrial development, highway and an existing wind farm indicate that the turbines would not be a prominent feature in the viewshed. No management direction applicable to scenic quality, and views of the Project would not compromise the purpose of facility.	No	<26
Research Forests OAR 345-022-0040(1)(n)	None	N/A	N/A	N/A	N/A	N/A	N/A
BLM Areas of Critical Environmental Concern OAR 345-022-0040(1)(o)	Oregon Trail ACEC (PAEC)	2.5	N	YES	Low impact. Viewshed analysis indicates moderate Project visibility at middleground to background viewing distance; views would include existing wind turbines, power lines and agricultural irrigation equipment. This site receives low levels of public use, up to a maximum of about 650 visitors per year. No management direction applicable to preservation of scenic qualities outside of ACEC. Views of turbines would not compromise the integrity of the remaining evidence of the Oregon Trail at this site. 3/	No	<26

Table L-2. Protected Areas Inventory, Visual and Noise Assessment Results (GE 2.5-120 Layout)

Protected Areas within 20 Miles of Site Boundary		Distance to Site Boundary (miles)	Direction from Project	Project Potentially Visible? 1/	Visual Analysis Results	Operational Noise Potentially Audible?	Worst-case Modeled Operational Noise Level (dBA L_{50})
Type	**Area Name**						
	Horn Butte Curlew ACEC	15	NW	YES	Negligible Impact. Viewshed analysis indicates good Project visibility; however, a far background viewing distance of over 15 miles and views of other existing wind farms in the area indicate that the Project turbines would not represent a new or unusual feature in the viewshed, and would not be a prominent feature in the viewshed from the ACEC. . No management direction applicable to preservation of scenic qualities outside of ACEC and views of the Project would not compromise the purpose of the ACEC.	No	<26
BLM Research Natural Areas and Outstanding Natural Areas OAR 345-022-0040(1)(o)	Boardman RNA	2.3	NNW	YES	Low impact. Viewshed analysis indicates moderate Project visibility at middleground to background viewing distance; views would include existing wind turbines, power lines and agricultural irrigation equipment. This site receives low levels of public use, up to a maximum of about 650 visitors per year. No management direction applicable to preservation of scenic qualities outside of ACEC. Views of turbines would not compromise the integrity of the remaining evidence of the Oregon Trail at this site. 3/	No	<26
State Wildlife Areas and Management Areas OAR 345-022-0040(1)(p)	Irrigon Wildlife Management Area	16.5	N	YES	Negligible Impact. Viewshed analysis indicates limited Project visibility; the Project turbines may be visible only from a small area at the far eastern end of the WMA. The far background viewing distance of over 16.5 miles, likely screening of views by existing vegetation, and views of the Project that would include other industrial and urbanized areas indicate that the turbines would not represent an unusual feature in the viewshed, and would not be prominent. No management direction applicable to scenic quality; views of the Project would not interfere with wildlife viewing or compromise the purpose of the WMA.	No	<26
	Power City Wildlife Management Area	14.5	N	YES	Negligible Impact. Viewshed analysis indicates limited Project visibility due to terrain screening; the turbines may be visible only in the northeastern quarter of the WMA, in an area where there are no developed use facilities and no apparent trails. The far background viewing distance of over 14.5 miles and views of the Project that would include other industrial and urbanized areas indicate that the turbines would not represent an unusual feature in the viewshed, and would not be prominent. No management direction applicable to scenic quality; views of the Project would not interfere with wildlife viewing or compromise the purpose of the WMA.	No	<26
	Coyote Springs Wildlife Management Area	14	N	YES	Negligible Impact. Viewshed analysis indicates good Project visibility; however, the far background viewing distance of over 14 miles and views in context with existing urban/industrial development, highway and existing wind farm, indicate that the turbines would not represent an unusual feature in the viewshed, and would not be prominent. No management direction applicable to scenic quality; views of the Project would not interfere with wildlife viewing or compromise the purpose of the WMA.	No	<26

Table L-2. Protected Areas Inventory, Visual and Noise Assessment Results (GE 2.5-120 Layout)							
Protected Areas within 20 Miles of Site Boundary		Distance to Site Boundary (miles)	Direction from Project	Project Potentially Visible? 1/	Visual Analysis Results	Operational Noise Potentially Audible?	Worst-case Modeled Operational Noise Level (dBA L_{50})
Type	Area Name						
	Willow Creek Wildlife Management Area	18	NW	YES	Negligible. Viewshed analysis indicates limited Project visibility; the Project would not be visible from the surface of the Willow Creek or any developed use area. From locations where the Project may be visible, the far background viewing distance of over 18 miles, and existing views that include existing energy infrastructure and highways, indicate that the turbines would not represent an unusual feature in the viewshed, and would not be prominent. No management direction applicable to scenic quality; views of the Project would not interfere with wildlife viewing or compromise the purpose of the WMA.	No	<26

1/ Indicates potential visibility of any part of wind turbine(s), Intraconnection Line(s), or other Project facilities as determined through viewshed analysis.

6.0 Submittal Requirements and Approval Standards

6.1 Submittal Requirements

Table L-3. Submittal Requirements Matrix	
Requirement	**Location**
OAR 3450-021-0010(1)(l) Information about the proposed facility's impact on protected areas, providing evidence to support a finding by the Council as required by OAR 345-022-0040, including:	
OAR 3450-021-0010(1)(l) (A) A list of the protected areas within the analysis area showing the distance and direction from the proposed facility and the basis for protection by reference to a specific subsection under OAR 345-022-0040(1).	Table L-1
OAR 3450-021-0010(1)(l) (B) A map showing the location of the proposed facility in relation to the protected areas listed in OAR 345-022-0040 located within the analysis area.	Figure L-1
OAR 3450-021-0010(1)(l) (C) A description of significant potential impacts of the proposed facility, if any, on the protected areas including, but not limited to, potential impacts such as:	
(i) Noise resulting from facility construction or operation;	Section 4.1, Tables L-1, L-2
(ii) Increased traffic resulting from facility construction or operation;	Section 4.2
(iii) Water use during facility construction or operation;	Section 4.3
(iv) Wastewater disposal resulting from facility construction or operation;	Section 4.3
(v) Visual impacts of facility structures or plumes.	Section 4.4, Tables L-1, L-2
(vi) Visual impacts from air emissions resulting from facility construction or operation, including, but not limited to, impacts on Class 1 Areas as described in OAR 340-204-0050.	Section 4.4 (N/A)
Project Order Comments	**Location**
For the Council to determine if the facility would have a significant adverse impact to the areas listed in its Protected Area standard, the application should contain sufficient analysis of impacts, including but not limited to, visual impacts of facility structures, noise from operation and construction and water use. Any sources not clearly defined in the NOI should also be evaluated.	Section 5.0, Tables L-1, L-2

6.2 Approval Standard

Table L-4. Approval Standard	
Requirement	**Location**
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:	
(a) National parks, including but not limited to Crater Lake National Park and Fort Clatsop National Memorial;	N/A
(b) National monuments, including but not limited to John Day Fossil Bed National Monument, Newberry National Volcanic Monument and Oregon Caves National Monument;	N/A
(c) Wilderness areas established pursuant to The Wilderness Act, 16 U.S.C. 1131 et seq. and areas recommended for designation as wilderness areas pursuant to 43 U.S.C. 1782;	N/A
(d) National and state wildlife refuges, including but not limited to Ankeny, Bandon Marsh, Baskett Slough, Bear Valley, Cape Meares, Cold Springs, Deer Flat, Hart Mountain, Julia Butler Hansen, Klamath Forest, Lewis and Clark, Lower Klamath, Malheur, McKay Creek, Oregon Islands, Sheldon, Three Arch Rocks, Umatilla, Upper Klamath, and William L. Finley;	Section 5.0, Tables L-1, L-2
(e) National coordination areas, including but not limited to Government Island, Ochoco and Summer Lake;	N/A
(f) National and state fish hatcheries, including but not limited to Eagle Creek and Warm Springs;	Section 5.0, Tables L-1, L-2
(g) National recreation and scenic areas, including but not limited to Oregon Dunes National Recreation Area, Hell's Canyon National Recreation Area, and the Oregon Cascades Recreation Area, and Columbia River Gorge National Scenic Area;	N/A
(h) State parks and waysides as listed by the Oregon Department of Parks and Recreation and the Willamette River Greenway;	Section 5.0, Tables L-1, L-2
(i) State natural heritage areas listed in the Oregon Register of Natural Heritage Areas pursuant to ORS 273.581;	Section 5.0, Tables L-1, L-2
(j) State estuarine sanctuaries, including but not limited to South Slough Estuarine Sanctuary, OAR chapter 142;	N/A
(k) Scenic waterways designated pursuant to ORS 390.826, wild or scenic rivers designated pursuant to 16 U.S.C. 1271 et seq., and those waterways and rivers listed as potentials for designation;	N/A
(L) Experimental areas established by the Rangeland Resources Program, College of Agriculture, Oregon State University: the Prineville site, the Burns (Squaw Butte) site, the Starkey site and the Union site;	N/A
(m) Agricultural experimental stations established by the College of Agriculture, Oregon State University, including but not limited to:	
Coastal Oregon Marine Experiment Station, Astoria	N/A
Mid-Columbia Agriculture Research and Extension Center, Hood River	N/A
Agriculture Research and Extension Center, Hermiston	Section 5.0, Tables L-1, L-2

Table L-4. Approval Standard	
Requirement	**Location**
Columbia Basin Agriculture Research Center, Pendleton	N/A
Columbia Basin Agriculture Research Center, Moro	N/A
North Willamette Research and Extension Center, Aurora	N/A
East Oregon Agriculture Research Center, Union	N/A
Malheur Experiment Station, Ontario	N/A
Eastern Oregon Agriculture Research Center, Burns	N/A
Eastern Oregon Agriculture Research Center, Squaw Butte	N/A
Central Oregon Experiment Station, Madras	N/A
Central Oregon Experiment Station, Powell Butte	N/A
Central Oregon Experiment Station, Redmond	N/A
Central Station, Corvallis	N/A
Coastal Oregon Marine Experiment Station, Newport	N/A
Southern Oregon Experiment Station, Medford	N/A
Klamath Experiment Station, Klamath Falls;	N/A
(n) Research forests established by the College of Forestry, Oregon State University, including but not limited to McDonald Forest, Paul M. Dunn Forest, the Blodgett Tract in Columbia County, the Spaulding Tract in the Mary's Peak area and the Marchel Tract;	N/A
(o) Bureau of Land Management areas of critical environmental concern, outstanding natural areas and research natural areas;	Section 5.0, Tables L-1, L-2
(p) State wildlife areas and management areas identified in OAR chapter 635, division 8.	Section 5.0, Tables L-1, L-2
OAR 345-022-0040(2) Notwithstanding section (1), the Council may issue a site certificate for a transmission line or a natural gas pipeline or for a facility located outside a protected area that includes a transmission line or natural gas or water pipeline as a related or supporting facility located in a protected area identified in section (1), if other alternative routes or sites have been studied and determined by the Council to have greater impacts. Notwithstanding section (1), the Council may issue a site certificate for surface facilities related to an underground gas storage reservoir that have pipelines and injection, withdrawal or monitoring wells and individual wellhead equipment and pumps located in a protected area, if other alternative routes or sites have been studied and determined by the Council to be unsuitable.	N/A
OAR 345-022-0040(3) The provisions of section (1) do not apply to transmission lines or natural gas pipelines routed within 500 feet of an existing utility right-of-way containing at least one transmission line with a voltage rating of 115 kilovolts or higher or containing at least one natural gas pipeline of 8 inches or greater diameter that is operated at a pressure of 125 psig.	N/A

Figures

Figure L-1

Wheatridge Wind Energy Facility

Protected Areas

Morrow and Umatilla Counties, OR

April 2015

Wheatridge East

Wheatridge West

Intraconnection Corridor

Umatilla Hatchery
Paterson
Irrigon Hatchery
Plymouth
Wildlife Management Area
730
McNary National Wildlife Refuge
Umatilla
334
Hat Rock State Park
Klickitat County
Umatilla National Wildlife Refuge
Irrigon
Willow Creek Wildlife Management Area
Alderdale
Irrigon Wildlife Management Area
Boardman
W1
82
Hermiston
37
Helix
Cold Springs National Wildlife Refuge
Coyote Springs Wildlife Management Area
Three Mile Adult Hold Fish Hatchery
E1
Oregon State University Agricultural Research Extension Center
14
84
335
ASHINGTON
OREGON
Arlington
Horn Butte ACECn
Oregon Trail ACEC
E2
Echo
207
Boardman Research Natural Area
Cecil
Pendleton
11
30
Mission
Rieth
331
Rock Creek
W3
W2
E3
W4
W5
W6
Lindsay Prairie Preserve
McKay Creek National Wildlife Refuge
Gilliam County
74
Ione
W8
Olex
Mikkalo
Lexington
W7
Pilot Rock
Umatilla County
19
Heppner
206
Condon
Morrow County
Union County
Hardman
244
Mayville
Lonerock
395
Ukiah

- Site Boundary
- Analysis Area (20 mile Buffer of Site Boundary)
- Boardman Bombing Range
- Construction Traffic Analysis Gates
- City/Town
- Rock Quarry
- Interstate Highway
- Federal Highway
- State Highway
- Local Road
- Transportation Route
- State Boundary
- County Boundary

Protected Areas

- Oregon State University Research Extension Center
- Fish Hatchery
- Wildlife Area
- National Wildlife Refuge
- Research Natural Area
- Prairie Preserve
- Area of Critical Environmental Concern

1:401,217 WGS84 UTM 11

0 2.5 5 10 15 20 25 30 35 40 45 50 Miles

Data Sources Wheatridge Wind Energy: site boundary / ESRI: roads, background imagery / ODFW: hatcheries, wildlife areas / BLM: ACEC / USFWS: wildlife refuges / Oregon State University: research extension centers / The Nature Conservancy: prairie preserve, research natural area

TETRA TECH

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Figure L-2

Wheatridge Wind Energy Facility

Protected Areas

- Maximum Project Impact - GE 1.7-103 Turbines

Morrow and Umatilla Counties, OR

December 2014

* Potential turbine visibility calculated using a 10 meter bare-earth digital elevation model with turbine heights of 472 feet (144 meters) representing 110% Maximum Blade Tip Height and a viewing height of 6 feet (1.8 meters).

Umatilla Hatchery
Irrigon Hatchery
Power City Wildlife Management Area
McNary National Wildlife Refuge
Umatilla National Wildlife Refuge
Hat Rock State Park
Willow Creek Wildlife Management Area
Irrigon Wildlife Management Area
Cold Springs National Wildlife Refuge
Coyote Springs Wildlife Management Area
Three Mile Adult Hold Fish Hatchery
Oregon State University Agricultural Research Extension Center
Horn Butte ACEC
Oregon Trail ACEC
Boardman Research Natural Area
McKay Creek National Wildlife Refuge
Lindsay Prairie Preserve
Wheatridge East
Intraconnection Corridor
Wheatridge West

Klickitat County
Benton County
Sherman County
Gilliam County
Umatilla County
Morrow County
Union County
Wheeler County

WASHINGTON
OREGON

221 82 730 334 37 335 11 14 84 30 331 207 74 19 206 395 244

1:425,000 WGS84 UTM 11

0 2.5 5 10 15 20 25 30 35 40 45 50 Miles

Data Sources Wheatridge Wind Energy: site boundary / ESRI: roads, background imagery / ODFW: hatcheries, wildlife areas / BLM: ACEC / USFWS: wildlife refuges / Oregon State University: research extension centers / The Nature Conservancy: prairie preserve, research natural area

Site Boundary
Analysis Area (20 mile Buffer of Site Boundary)
Interstate Highway
Federal Highway
State Highway
State Boundary
County Boundary

Viewshed

Number of Turbines Visible *

0
1 - 25
26 - 50
51 - 75
75 - 100
101 - 125
126 - 150
151 - 175
176 - 200
201 - 225
226 - 250
251 - 275
275 - 292

Protected Areas

Oregon State University Research Extension Center
Fish Hatchery
Wildlife Area
National Wildlife Refuge
Research Natural Area
Prairie Preserve
Area of Critical Environmental Concern

TETRA TECH

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Figure L-3

Wheatridge Wind Energy Facility

Protected Areas

- Minimum Project Impact -
GE 2.5-120 Turbines

Morrow and Umatilla Counties, OR

December 2014

* Potential turbine visibility calculated using a 10 meter bare-earth digital elevation model with turbine heights of 525 feet (160 meters) representing 110% Maximum Blade Tip Height and a viewing height of 6 feet (1.8 meters).

Umatilla Hatchery
Irrigon Hatchery
Power City Wildlife Management Area
McNary National Wildlife Refuge
Umatilla National Wildlife Refuge
Hat Rock State Park
Willow Creek Wildlife Management Area
Irrigon Wildlife Management Area
Cold Springs National Wildlife Refuge
Coyote Springs Wildlife Management Area
Three Mile Adult Hold Fish Hatchery
Oregon State University Agricultural Research Extension Center
Horn Butte ACEC
Oregon Trail ACEC
Boardman Research Natural Area
McKay Creek National Wildlife Refuge
Lindsay Prairie Preserve
Wheatridge East
Intraconnection Corridor
Wheatridge West

Klickitat County
Benton County
Sherman County
Gilliam County
Umatilla County
Morrow County
Union County
Wheeler County

WASHINGTON
OREGON

221 82 730 334 37 335 11 14 84 30 331 207 74 19 206 395 244

1:425,000 WGS84 UTM 11

0 2.5 5 10 15 20 25 30 35 40 45 50 Miles

Data Sources Wheatridge Wind Energy: site boundary / ESRI: roads, background imagery / ODFW: hatcheries, wildlife areas / BLM: ACEC / USFWS: wildlife refuges / Oregon State University: research extension centers / The Nature Conservancy: prairie preserve, research natural area

Site Boundary
Analysis Area (20 mile Buffer of Site Boundary)
Interstate Highway
Federal Highway
State Highway
State Boundary
County Boundary

Viewshed

Number of Turbines Visible *
- 0
- 1 - 25
- 26 - 50
- 51 - 75
- 76 - 100
- 101 - 125
- 126 - 150
- 151 - 175
- 176 - 200

Protected Areas
- Oregon State University Research Extension Center
- Fish Hatchery
- Wildlife Area
- National Wildlife Refuge
- Research Natural Area
- Prairie Preserve
- Area of Critical Environmental Concern

TETRA TECH

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Exhibit M

Applicant's Financial Capability

Prepared for

Wheatridge Wind Energy, LLC

Wheatridge Wind Energy Facility

July 2015

Prepared by

Tetra Tech, Inc.

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List of Tables

List of Attachments

Terms and Definitions

EFSC	Energy Facility Siting Council
OAR	Oregon Administrative Rule
Project	Wheatridge Wind Energy Facility
Wheatridge	Wheatridge Wind Energy, LLC

1.0 Introduction

Exhibit M provides information on Wheatridge Wind Energy, LLC's (Wheatridge) financial capability, including the Retirement and Financial Assurance as required for the Energy Facility Siting Council (EFSC) to make the appropriate findings under Oregon Administrative Rule (OAR) 345-022-0050(2):

> *"345-022-0050 Retirement and Financial Assurance*
>
> *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."*

As discussed in Exhibit W, in the very unlikely event that a permanent cessation of construction or operation of the Wheatridge Wind Energy Facility (Project) occurs, the site can be restored to a useful, non-hazardous condition. However, in this Exhibit Wheatridge will establish that it has a reasonable likelihood of obtaining a bond or letter of credit in a form and amount satisfactory to EFSC to restore the site to a useful, non-hazardous condition, as discussed below.

2.0 Opinion of Legal Counsel

Attachment M-1 is an opinion from Wheatridge's legal counsel, David Peterson of Tonkon Torp, indicating that Wheatridge has the legal authority to construct and operate the Project without violating its articles of incorporation or similar agreements.

3.0 Proposed Type and Amount of Financial Instrument

Prior to beginning construction on the Project, Wheatridge will submit a bond, bonds, or letter(s) of credit to the State of Oregon in an amount equal to the net costs of Project retirement as detailed in Exhibit W. The bond(s) or letter(s) of credit will be provided in a form approved by EFSC and will ensure that adequate funds exist for the retirement of the Project and for restoration of the Project site to a useful, non-hazardous condition. The bond(s) or letter(s) of credit will be adjusted annually for inflation according to the Gross Domestic Product Implicit Price Deflator Index.

4.0 Evidence of Reasonable Likelihood of Obtaining Security

Wheatridge has obtained a letter from one of the company's relationship banks (Attachment M-2) demonstrating the reasonable likelihood that they will be able to obtain a bond(s) in an amount equal to or greater than the cost of Project retirement as detailed in Exhibit W.

5.0 Conclusion

The evidence provided in this exhibit demonstrates that Wheatridge has a reasonable likelihood of obtaining a bond or letter of credit in an amount sufficient to restore the site to a useful, non-hazardous condition.

6.0 Submittal Requirements and Approval Standards

6.1 Submittal Requirements

Table M-1. Submittal Requirements Matrix

Requirement	Location
OAR 345-021-0010(1)(m) Information about the applicant's financial capability, providing evidence to support a finding by the Council as required by OAR 345-022-0050(2). Nothing in this subsection shall require the disclosure of information or records protected from public disclosure by any provision of state or federal law. The applicant shall include:	
OAR 345-021-0010(1)(m)(A) An opinion or opinions from legal counsel stating that, to counsel's best knowledge, the applicant has the legal authority to construct and operate the facility without violating its bond indenture provisions, articles of incorporation, common stock covenants, or similar agreements.	Section 2, Attachment M-1
OAR 345-021-0010(1)(m)(B) The type and amount of the applicant's proposed bond or letter of credit to meet the requirements of OAR 345-022-0050.	Section 3
OAR 345-021-0010(1)(m)(C) Evidence that the applicant has a reasonable likelihood of obtaining the proposed bond or letter of credit in the amount proposed in paragraph (B), before beginning construction of the facility.	Section 4, Attachment M-2

6.2 Approval Standard

Table M-2. Approval Standard	
Requirement	**Location**
OAR 345-022-0050 Retirement and Financial Assurance	
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.	Exhibit W
(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.	Section 4

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Attachment M-1:

Opinion of Legal Counsel

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Attachment M-2:

Letter from the Bank of Eastern Oregon

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Attachments

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Attachment M-1:

Opinion of Legal Counsel

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TONKON TORP LLP
ATTORNEYS

1600 Pioneer Tower
888 SW Fifth Avenue
Portland, Oregon 97204
503.221.1440

David J. Petersen
Admitted to practice in Oregon and California

503.802.2054
Fax: 503.972.3754
david.petersen@tonkon.com

August 4, 2014

Oregon Department of Energy
625 Marion Street, N.E.
Salem, Oregon 97301

Re: Application of Wheatridge Wind Energy, LLC for Site Certificate

To Whom It May Concern:

This opinion supersedes the prior opinion of Tonkon Torp LLP on the same subject dated July 29, 2014, which is of no further force or effect.

Tonkon Torp LLP is legal counsel for Wheatridge Wind Energy, LLC, a Delaware limited liability company (the "Applicant"). In that role, we have examined the following with respect to the Applicant:

1. Certificate of Conversion and Certificate of Formation dated November 12, 2010;
2. Certificate of Good Standing from the Delaware Secretary of State dated July 28, 2014;
3. Operating Agreement dated October 20, 2010;
4. Action by Written Consent of the Sole Member of Applicant dated October 30, 2012; and
5. such other documents and instruments as we have deemed necessary and appropriate for purposes of this opinion.

In rendering this opinion expressed below, we have assumed (i) the authenticity of all the documents submitted to us as originals and (ii) the conformity to original documents of all documents submitted to us as copies. As to factual matters, we have relied to the extent deemed proper upon statements and certification of officers and managers of the Applicant.

Based on the foregoing, to the best of our knowledge, we are of the opinion that, subject to the Applicant meeting of all applicable federal, state and local laws (including all rules and regulations promulgated thereunder), the Applicant has the legal authority to construct and operate the wind generation facility and associated facilities located in Morrow and Umatilla Counties, Oregon (the "Project") that the Applicant proposes in its Application for Site Certificate to be filed with the Oregon Energy Facility Siting Council and in connection with

which this opinion is rendered, without violating articles of organization covenants or similar agreements.

This opinion is limited to the law of the state of Oregon.

The foregoing opinion is limited solely to whether the Applicant has the authority to construct, own and operate the Project. We express no opinion as to the applicability of, or the effects of, any federal, state or local laws (including all rules and regulations promulgated thereunder) on such construction and operation.

For purposes of this opinion, "our knowledge" is limited to the knowledge of David J. Petersen, a partner in the firm, who has primary responsibility for representation of the Applicant. Please contact Mr. Petersen if you have any additional questions regarding this matter.

Best regards,

TONKON TORP LLP

By: _____
David J. Petersen, Partner

DJP/KAS/rkb

036541/00001/5705227v1

Attachment M-2:

Letter from the Bank of Eastern Oregon

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Bank of Eastern Oregon

December 4, 2014

Oregon Energy Facility Siting Council
625 Marion Street NE
Salem, OR 97301

To whom it may concern,

Jerry Rietmann, Chairman of Wheatridge Wind Energy, LLC has been a valued customer of the Bank of Eastern Oregon for many years. It is our opinion that he has the ability to effectively manage the Wheatridge Wind Energy project to its completion.

It is our understanding that Bank of Eastern Oregon may be asked to provide a letter of credit on behalf of Jerry Rietmann for Wheatridge Wind Energy to support the proposed wind power facility. It is also our understanding that this potential letter of credit could be required in the amount of seventeen million five hundred thousand ($17,500,000) dollars.

This letter does not constitute a commitment for issuance of the potential letter of credit. It will be subject to our review and acceptance of the terms and conditions of the final contract along with further credit underwriting for the potential request.

Sincerely,

Jeff L. Bailey
President and CEO
Bank of Eastern Oregon

Administrative Offices
250 NW Gale St. • P.O. Box 39 • Heppner, Oregon 97836
Phone (541) 676-0201 • Fax (541) 676-0226

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Exhibit N

Need for Facility

Prepared for

Wheatridge Wind Energy, LLC

Wheatridge Wind Energy Facility

July 2015

Prepared by

Tetra Tech, Inc.

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OAR 345-021-0010(1)(n) requires proponents to provide information about the need for non-generating facilities.

The Wheatridge Wind Energy Facility (Project) is exempt from the requirements of OAR 345-021-0010(1)(n), since the Project is an energy-generating facility.

Exhibit O

Water Use

Prepared for

Wheatridge Wind Energy, LLC

Wheatridge Wind Energy Facility

July 2015

Prepared by

Tetra Tech, Inc.

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Terms and Definitions

Collector Line	An underground or overhead electrical 34.5 kV line transmitting power from the turbines to a Substation
Construction Yard	The temporary area for construction activities and Project component storage prior to installation
GE 1.7-103 Layout	Project turbine layout comprised of 292 GE 1.7MW turbines with 80m hub heights and 103m rotor diameters
GE 2.5-120 Layout	Project turbine layout comprised of 200 GE 2.5MW turbines with 85m hub heights and 120m rotor diameters
Gen-tie Line(s)	One or two 230 kV transmission line(s) conveying power from the Project to an interconnection point with the grid, which will be permitted and built by UEC or UEC/CB
Intraconnection Corridor	The intraconnection transmission line corridor connecting Wheatridge East with Wheatridge West
Intraconnection Line(s)	One or two overhead electrical 230 kV lines connecting the Project Substations in Wheatridge East and Wheatridge West.
Met Tower	Permanent meteorological tower
O&M Buildings	Permanent operations and maintenance buildings, including parking
Project	Wheatridge Wind Energy Facility
Site Access Road	Private road to be constructed or improved for the purpose of accessing turbines and associated Project facilities
Site Boundary	The boundary within which all Project facilities will be constructed, also known as the micrositing corridor
Substation	A facility in which electric power from the turbines is aggregated, stepped up in voltage, and connected to the Intraconnection Line(s) or the Gen-tie Line(s)
Turbine	A collective term for the foundation, tower, nacelle, blades and rotor that comprise a wind turbine generator in the Project
Turbine Pad	A cleared, graveled area around the base of each turbine encompassing primarily the turbine's foundation
Wheatridge	Wheatridge Wind Energy, LLC
Wheatridge East	The eastern group of turbines
Wheatridge West	The western group of turbines

Acronyms and Abbreviations

Mgal	million gallons
OAR	Oregon Administrative Rules
ORS	Oregon Revised Statutes

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1.0 Introduction

Wheatridge Wind Energy, LLC (Wheatridge), proposes to construct the Wheatridge Wind Energy Facility (Project), a wind generation facility with a maximum nominal generating capacity of 500 megawatts (MW) in Morrow and Umatilla counties, Oregon (see Figures C-1 and C-2). The Project is comprised of up to 292 turbines divided into two groups: a western group of turbines (Wheatridge West) and an eastern group of turbines (Wheatridge East). Wheatridge West and Wheatridge East are electrically connected by an 'Intraconnection Corridor' containing up to two parallel overhead 230-kilovolt (kV) transmission lines (Intraconnection Lines), each no longer than 35 miles in length. Other Project components include access roads (Site Access Roads), an electrical collection and control system, the Project's substations (Substations), operations and maintenance buildings (O&M Buildings), and temporary construction yards (Construction Yards). These facilities are all described in greater detail in Exhibit B.

Wheatridge West is located entirely within Morrow County, approximately 5 miles northeast of Lexington, and approximately 7 miles northwest of Heppner. Wheatridge West is bisected by Oregon Highway 207 (OR-207). Wheatridge East is located approximately 16 miles northeast of Heppner and encompasses land in both Morrow and Umatilla counties. The Intraconnection Corridor is located entirely within Morrow County and adjoins to the southeastern portion of Wheatridge West and the southern portion of Wheatridge East.

Exhibit O provides information on anticipated water use during construction and operation of the Wheatridge Wind Energy Project (Project), to meet the submittal requirements in Oregon Administrative Rule (OAR) 345-021-0010(1)(o) paragraphs (A) through (G). Paragraph (D) and (F) are not applicable because the Project is not a thermal power plant or in need of a groundwater permit. OAR 345 Division 22 does not provide an approval standard specific to Exhibit O.

2.0 Water Uses

The following sections identify the nature of water use for the Project, estimated water quantities and sources and anticipated water losses.

2.1 Construction

2.1.1 Uses

The primary drivers of water use during construction are mixing concrete for turbine foundations and dust control. Water trucks will be used to control dust generation in all disturbed areas during road construction; foundation installation; turbine and transmission structure erection, and final cleanup, reclamation, and restoration. Fire prevention represents a minor water use; this would involve stationing a water truck at the job site to keep the ground and vegetation moist during extreme fire conditions.

For the construction of foundations, water will be transported to concrete batch plant sites (located at laydown areas) where it will be used to mix wet concrete. From the batch plant, the wet concrete will be transported to the construction sites in concrete trucks for use in foundation installation. The concrete batch plant/laydown areas are identified in Figure G-1 of Exhibit G. Wheatridge may choose to buy concrete directly from licensed suppliers in the area in which case the on-site concrete batch plants and the water required for concrete mixing would be covered by the concrete suppliers under their existing permits.

Wheatridge Wind Energy, LLC (Wheatridge) will implement dust control measures at all areas disturbed by construction activities. During construction, equipment will be cutting, moving and compacting the subgrade surface; stockpiling soils for later use; and performing decompaction (as needed) and final grading for site revegetation. Depending on weather conditions, water trucks patrolling the site to control dust will make as many as one pass per hour, wetting down disturbed and exposed soils. Once site preparation work is complete, meaning all soil disturbance is completed and the site ready for revegetation, dust control becomes minimal.

Water is not anticipated to be needed for site revegetation, which would instead rely on natural precipitation and native seed types that are adapted to the rainfall regime of the region.

2.1.2 Amounts

During construction the Project will require an anticipated maximum 56.5 million gallons (Mgal) of water. This water will be used in activities such as road construction, installation of Intraconnection Lines, and concrete mixing, among others. Water will also be used for dust control on dirt and gravel roads, turbine pads, and laydown areas.

Water use totals are presented in the format of Project construction taking place in a single 18 month construction period. In the event that Wheatridge elects to construct the Project in two or more phases, total water required for construction and dust control would be no greater than the maximum estimate of 56.6 million gallons as presented in this exhibit and would in all likelihood be less considering later periods of construction would make use of Project facilities that were constructed during previous phases.

Estimated total water usage for concrete mixing, road construction, and dust control is summarized as follows:

- Total water for concrete mixing – 3,650,000 gallons
    - Turbine tower foundations – 3,340,000 gallons
    - Met tower foundations – 18,000 gallons
    - Intraconnection Lines towers – 245,000 gallons
    - Substations – 32,000 gallons
    - O&M buildings – 15,000 gallons
- Total water for road construction – 9,636,000 gallons
    - Assuming 25 gallons per lineal foot of road
- Total water for dust control – 43,200,000 gallons

- Assuming 100,000 gallons per day, six days per week, over an 18 month construction period.

Approximately 3.65 Mgal of the total estimated amount of water would be required for mixing concrete for turbine and transmission tower foundations, fire prevention, and other incidental uses. This estimate is based on the following assumptions:

- Water use is based on a typical spread-footing turbine foundation design. Alternative turbine foundations types, such as caissons, may be employed if determined appropriate to the site conditions; the use of other foundations designs would typically use less water than the spread-footing foundations.
- The typical spread-footing foundation design is based on general soil conditions, and does not consider local soil characteristics. The actual water usage may vary based the size of the foundation, which is a function of soil properties and tower reaction loads.
- The estimate is based on the maximum number of potential wind turbines that may be installed for the Project. The actual water usage may be less than this estimate, if fewer turbines are constructed.

Approximately 47,000 gallons of the total estimated amount of water would be required for the construction of the substations and O&M buildings. Water would be required for foundation construction, grading of parking areas, and other incidental uses required in the construction of both facilities. Approximately 9.6 Mgal of the total estimated amount of water would be required for new road construction. Water would be required for grading, compaction, concrete mixing where required.

Approximately 43.2 Mgal of the total estimated amount of water would be used for dust control under typical conditions. Actual dust control water use will vary, depending on the timing of construction and the season, precipitation, soil conditions, temperature, and frequency of repeat disturbance; none of which can be controlled or easily estimated by the contractor. Average water use for Project dust control was estimated at 50,000 gallons per day, running six days per week over an 18 month construction period for each of the two phases of project construction. Based on an 18 month construction period under typical environmental conditions, the average monthly water demand would be approximately 3.14 Mgal; the average daily water demand would be approximately 104,600 gallons.

A worst-case water use figure would result from construction in particularly dry weather conditions with high temperatures, and is estimated to require approximately 50 percent additional water use for dust control than in average conditions. Based on this assumption, a 'worst case' water estimate for the Project is calculated as follows:

Total water for dust control (average conditions) =	43,200,000 gallons
50 percent additional dust control water use for worst case =	21,600,000 gallons
Subtotal (total worst case water for dust control) =	64,800,000 gallons

Total water for concrete & other uses = 13,286,000 gallons

Total Worst Case = 78,086,000 gallons

Should construction occur in a particularly dry year, the water required for dust control during construction could increase to an estimated 64.8 Mgal, increasing the total water requirement for all construction uses to approximately 78 Mgal. The worst-case total average monthly water demand for all construction and dust control would therefore be approximately 4.3 Mgal, and the average daily water demand would increase to approximately 144,600 gallons.

It should be noted, that the primary consumer of water during Project construction is dust control on access roads. The total water use under average conditions (43.2 Mgal) and under worst case conditions (64.8 Mgal) assumes that all Project roads will be water multiple times each day, even in portions of the Project where no construction is being undertaken. In reality, Project construction will be a focused effort on specific portions of the Project to maximize efficiency and as such will not require watering of roads for dust control in portions of the Project where no construction is taking place.

2.1.3 Water Sources

Wheatridge intends to use water trucks for the delivery of water from nearby locations with existing water rights, such as the Port of Morrow, Hermiston, Stanfield, or Boardman. If these are not sufficient sources of water, Wheatridge will seek to obtain water from other licensed providers of waters in nearby cities.

No groundwater permit, surface water permit, or a water right transfer is anticipated for this Project because water will be procured from municipal sources, as near to the construction sites as reasonably possible. Wheatridge has contacted the suppliers listed in Table O-1, who have tentatively indicated willingness and ability to supply water for the Project. Attachments O-1, O-2, O-3 and O-4 are a record of communication with these water suppliers. Suppliers will most likely contract for water with the Project construction contractor, though Wheatridge may contract directly with the suppliers.

The quantities available shown in Table O-1 are based on written correspondence from the various water suppliers contacted, and demonstrate that an adequate supply of water for Project construction is available.

Table O-1. Potential Water Suppliers			
Supplier Name	**Contact**	**Quantity Available (gallons)**	**Water Right Certificate Number**
Hermiston Public Works	Roy Bicknell	2.2 Mgal per month	G6831
Stanfield Public Works	Scott Morris	1.8 Mgal per month	12224 and 66058
Boardman Public Works	Dave Winters	150,000 – 300,000 gallons per month	40336 and 2624
Port of Morrow	Gary Neal	6.5 Mgal per month	G7158, G8263, G5332, G10976, G12729, G13283, G10312, G4626, G10312, G4626, G12370

Wheatridge contacted the Public Works departments in Boardman, Hermiston, Stanfield, as well as the Port of Morrow. The entities listed in Table O-1 have affirmed their ability to sell water to Wheatridge. Letters documenting formal commitments from each water supplier will be provided prior to construction.

Wheatridge believes that adequate water for Project construction can be obtained from the Port of Morrow in conjunction with local Public Works departments and that no additional permitting, Limited Water Use Licenses, water right transfers, or new water rights will be required. No permits or transfers are required because the municipal water rights allow use for industrial purposes such as a wind farm.

Based on communication with the above suppliers, Wheatridge believes the contacts made to date, which amount to a non-binding commitment to supply up to 4.3 Mgal per month for Project construction constitutes "evidence to support a finding by the Council as required by OAR 345-022-0110" as requested in OAR 345-0210010(1)(u)(D).

2.1.4 Disposal

Wheatridge does not anticipate any discharge of water from the Project. During construction, water loss will occur primarily through evaporation from wetted road surfaces. Because of the relatively low rates of water use and application, it is assumed that no run-off will occur outside of the Site Boundary. Water used for foundations will remain in the concrete mix. Management and handling of concrete truck washout is discussed in Exhibit V. No water used for the Project will be discharged into wetlands, lakes, rivers, or streams. During construction, sanitary facilities will be portable toilets that will not require water. Portable toilets will be maintained by a licensed service provider.

2.2 Operation and Maintenance

During operation the Project will require water for use in the O&M buildings. Similar in nature to a commercial office employing approximately ten people, each O&M building would require less than 5,000 gallons per day. This is considered an exempt use, which would not require a new water right

to be obtained under Oregon Revised Statutes (ORS) 537.545. Wheatridge anticipates that a new exempt well would be drilled for the purpose of supplying water to each of the O&M buildings.

3.0 Mitigation Measures

No adverse impacts are expected to result from Project water use during construction or operation; therefore, no mitigation measures are proposed.

4.0 Conclusions

The Project has minimal water requirements. Water will be needed during the construction phase for concrete mixing, dust control, and other minor uses. Typical operation and maintenance activities will not require water.

5.0 Submittal Requirements and Approval Standards

5.1 Submittal Requirements

Table O-2. Submittal Requirements Matrix

Requirement	Location
OAR 345-021-0010(1)(o) Information about anticipated water use during construction and operation of the proposed facility. The applicant shall include:	
(A) A description of the use of water during construction and operation of the proposed facility.	Section 2.0
(B) A description of each source of water and the applicant's estimate of the amount of water the facility will need during construction and during operation from each source under annual average and worst-case conditions.	Section 2.0
(C) A description of each avenue of water loss or output from the facility site for the uses described in (A), the applicant's estimate of the amount of water in each avenue under annual average and worst-case conditions and the final disposition of all wastewater.	Section 2.0
(D) For thermal power plants, a water balance diagram, including the source of cooling water and the estimated consumptive use of cooling water during operation, based on annual average conditions.	N/A
(E) If the proposed facility would not need a groundwater permit, a surface water permit or a water right transfer, an explanation of why no such permit or transfer is required for the construction and operation of the proposed facility.	Section 2.1.2, 2.2
(F) If the proposed facility would need a groundwater permit, a surface water permit or a water right transfer, information to support a determination by the Council that the Water Resources Department should issue the permit or transfer of a water use, including information in the form required by the Water Resources Department under OAR chapter 690, divisions 310 and 380.	Section 2.0

Table O-2. Submittal Requirements Matrix	
Requirement	**Location**
(G) A description of proposed actions to mitigate the adverse impacts of water use on affected resources.	N/A
Project Order Comments	**Location**
The application must identify the sources of water to be used during construction and operation of the proposed facility, the water right under which the water would be provided, the quantity of water needed, and the means of disposal of all water discharges from the proposed facility.	Section 2.0
The Applicant will be required to obtain a letter from the municipal source stating that it has the capacity to provide all the water requested during peak capacity demand days. The letter must list the permits or certificates necessary to support the use. If the Applicant is unable to obtain this documentation, the Applicant must show how much storage it will need to augment demand during peak demand days, and how it will provide that additional storage.	Attachments O-1, O-2, O-3, O-4
The application should include evidence and analysis to determine whether a new water right, water right transfer or limited license is required. If a new water right, water right transfer or Limited License is required, the application must include evidence to support a finding by the Council for issuance of a groundwater or surface water permit under ORS Chapter 537 (Appropriation of Water Generally) or transfer of a water use under ORS Chapter 540 (Transfer or Forfeiture of Water Rights), including a discussion and evaluation of all relevant factors, including those factors listed in ORS 537.153(2) and (3), ORS 537.170(8) and OAR Chapter 690, Divisions 310 (Water Right Application Processing) and 380 (Water Right Transfers).	Section 2.0
If the facility does not need a groundwater permit, a surface water permit or a water right transfer, the application should include an explanation as to why such a permit or transfer is not required for construction and operation of the proposed facility.	Section 2.0

5.2 Approval Standard

OAR 345 Division 22 does not provide an approval standard specific to Exhibit O.

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Attachment O-1:

Record of Correspondence with Boardman Public Works Department

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Attachment O-2:

Record of Correspondence with Hermiston Public Works Department

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Attachment O-3:

Record of Correspondence with Stanfield Public Works Department

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Attachment O-4:

Record of Correspondence with PORT OF MORROW

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Attachments

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Attachment O-1:

Record of Correspondence with Boardman Public Works Department

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Friedel, Robert

From: Dave Winters <Public.Works@cityofboardman.com>
Sent: Friday, August 01, 2014 8:52 AM
To: Friedel, Robert
Subject: RE: Wheatridge: request for a service provider letter for water

Robert,

The City of Boardman could provide up to 300,000 gals. of water pre-month during our non-seasonal usage but would drop down to 150,000 gals. per-month from June 1st to September 30th during our high usage months.
If you have any further question please send me an email or give me a call at 541-481-9252.

Thank you
Dave Winters

From: Friedel, Robert [mailto:Robert.Friedel@tetratech.com]
Sent: Thursday, July 31, 2014 10:15 AM
To: Dave Winters
Subject: Wheatridge: request for a service provider letter for water

Dave,

Nice to speak with you earlier, I appreciate you taking the time from you day to talk with me and provide a letter on water availability.

As we discussed, Tetra Tech is under contract to Wheatridge Wind Energy, LLC (Wheatridge) to permit the Wheatridge Wind Energy Facility (Project) though 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 obtaining water for construction of the Project. Our current, conservative, estimate of water use anticipated for Project construction is approximately 40 million gallons over an 18 month period, to begin after receiving a permit to construct.

At this point in the process, Wheatridge is not required to have entered into a contact with Boardman Department Public Works (Boardman) for water supply, we just need to demonstrate to ODOE that we have been in consultation with Boardman and that yes, you are licensed to supply water to Wheatridge, how much, and seasonal constraints. 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 Project, we just need to demonstrate to ODOE that you have water to sell and that we could use Boardman as a water supplier if we, at a later date, come to an agreement to do so.

What I am requesting from you is an email, or written letter if you prefer, stating that we have been in contact, you understand our request, and that Boardman can provide up to **XX gallons of water per month**, **noting any seasonal restrictions** on the amount of water you can supply. **Our requirement for the permit in regards to obtaining water is pretty straight-forward: from whom / contact individual / how many gallons available / water right permit number**.

To provide you a bit more background on the project I'm attaching a link to our Notice of Intent (NOI), available on ODOE's website and attaching the vicinity map of the project from the NOI. If you have any questions or would like to talk about this further please call me anytime at your convenience. I appreciate your help this portion of our permit application and I look forward to speaking with you again.

Sincerely,

Robert Friedel

Link to Wheatridge NOI on ODOE website: http://www.oregon.gov/energy/Siting/Pages/WRW.aspx

Robert Friedel - GISP
GIS Coordinator / Project Manager
direct: 503.721.7216 | cell: 541.231.9990
robert.friedel@tetratech.com

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Portland OR, 97201
Main: 503-221-8636
Fax: 503-227-1287
www.tetratech.com

Attachment O-2:

Record of Correspondence with Hermiston Public Works Department

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Friedel, Robert

From: Roy Bicknell <rbicknell@hermiston.or.us>
Sent: Tuesday, July 29, 2014 12:57 PM
To: Friedel, Robert
Cc: Mark Morgan; Alex Mccann
Subject: RE: Wheatridge: requesting a service provider letter

Rob,

In regards to our conversation for the project of the Wheatridge Wind Energy Facility & anticipated project construction water needs of 40 million gallons over an 18 month period. I would like to provide the following information as an estimate of water availability.

The City of Hermiston, is a licensed public water supplier & under normal conditions, could provide up to an estimated 2.2 million gallons of water per month. Seasonal demand in our system depends greatly on ambient temperatures. During high demand times we could require constraints on the amount available per month. During low demand times it may be possible to provide more than indicated above.

As the project approaches it would be advisable to confirm the water availability. At such time, if a timeline schedule for water needs is provided it could assist in providing detailed information as to the amount of water available throughout the project.

Please let me know if you need anything else.

Thank you~Roy

Roy Bicknell
City of Hermiston
Water Superintendent
water@hermiston.or.us
541-567-5521
HERMISTON
YOU CAN GROW HERE.

From: Friedel, Robert [mailto:Robert.Friedel@tetratech.com]
Sent: Monday, July 28, 2014 12:59 PM
To: Roy Bicknell
Cc: Mark Morgan
Subject: RE: Wheatridge: requesting a service provider letter

Good afternoon Roy,

Thank you and Mark for making time to talk with me Friday. I wanted to re-forward the letter I had sent you a week or so ago for your reference. If you have any more questions just let me know.

Sincerely,

Rob Friedel

Robert Friedel - GISP
GIS Coordinator / Project Manager
direct: 503.721.7216 | cell: 541.231.9990
robert.friedel@tetratech.com

Tetra Tech, Inc.
1750 SW Harbor Way, Suite 400
Portland OR, 97201
Main: 503-221-8636
Fax: 503-227-1287
www.tetratech.com

****

Tetra Tech is under contract to Wheatridge Wind Energy, LLC (Wheatridge) to permit the Wheatridge Wind Energy Facility (Project) though 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 obtaining water for construction of the Project. Our current, conservative, estimate of water use anticipated for Project construction is approximately 40 million gallons over an 18 month period, to begin after receiving a permit to construct.

At this point in the process, Wheatridge is not required to have entered into a contact with Hermiston Department Public Works (Hermiston) for water supply, we just need to demonstrate to ODOE that we have been in consultation Hermiston and that yes, you are licensed to supply water to Wheatridge, how much, and seasonal constraints. 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 Project, we just need to demonstrate to ODOE that you have water to sell and that we could use Hermiston as a water supplier if we, at a later date, come to an agreement to do so.

What I am requesting from you is an email, or written letter if you prefer, stating that we have been in contact, you understand our request, and that Hermiston can provide up to **XX gallons of water per month**, **noting any seasonal restrictions** on the amount of water you can supply. **Our requirement for the permit in regards to obtaining water is pretty straight-forward: from whom / contact individual / how many gallons available / water right permit number**. Please also state that your letter represents an estimate of water available for Wheatridge at this date and that prior to construction Hermiston and Wheatridge will enter into a contract to supply water for Project construction.

To provide you a bit more background on the project I'm attaching a link to our Notice of Intent (NOI), available on ODOE's website. If you have any questions or would like to talk about this further please call me anytime at your convenience. I appreciate your help this portion of our permit application and I look forward to speaking with you again.

Sincerely,

Robert Friedel

Link to Wheatridge NOI on ODOE website: http://www.oregon.gov/energy/Siting/Pages/WRW.aspx

Robert Friedel - GISP
GIS Coordinator / Project Manager
direct: 503.721.7216 | cell: 541.231.9990

robert.friedel@tetratech.com

Tetra Tech, Inc.
1750 SW Harbor Way, Suite 400
Portland OR, 97201
Main: 503-221-8636
Fax: 503-227-1287
www.tetratech.com

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Attachment O-3:

Record of Correspondence with Stanfield Public Works Department

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Friedel, Robert

From: Scott Morris <smorris@cityofstanfield.com>
Sent: Thursday, July 24, 2014 3:38 PM
To: Friedel, Robert
Subject: RE: Wheatridge: requesting a service provider letter to use water from Stanfield Public Works Dept.

Robert,

To your request to purchase water from the City of stanfield we would be able to supply water from October thru June as these are not our high usage months. We would be able to supply 60,000 gallons of water per day.

Sincerely,

Scott Morris
Public Works Director
City of Stanfield

From: Friedel, Robert [mailto:Robert.Friedel@tetratech.com]
Sent: Wednesday, July 16, 2014 2:45 PM
To: smorris@cityofstanfield.com
Subject: Wheatridge: requesting a service provider letter to use water from Stanfield Public Works Dept.

Good afternoon Scott,

I left you a voicemail on this subject last week and this email is a follow-up to that message, I hope I left the voicemail with the right person.

Tetra Tech is under contract to Wheatridge Wind Energy, LLC (Wheatridge) to permit the Wheatridge Wind Energy Facility (Project) though 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 obtaining water for construction of the Project. Our current, conservative, estimate of water use anticipated for Project construction is approximately 40 million gallons over an 18 month period, to begin after receiving a permit to construct the project.

At this point in the process, Wheatridge is not required to have entered into a contact with Stanfield Public Works for water supply, we just need to demonstrate to ODOE that we have been in consultation with Stanfield Public Works and that yes, you are licensed to supply water to Wheatridge, how much, and seasonal constraints. 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 Project, we just need to demonstrate to ODOE that you have water to sell and that we could use Stanfield Public Works as a water supplier if we, at a later date, come to an agreement to do so.

What I am requesting from you is an email, or written letter if you prefer, stating that we have been in contact, you understand our request, and that Stanfield Public Works can provide up to XX gallons of water per month, noting any seasonal restrictions on the amount of water you can supply. Our requirement for the permit in regards to obtaining water is pretty straight-forward: from whom / contact individual / how many gallons available / water right permit number. Please also state that your letter represents an estimate of water available for Wheatridge at this date and that prior to construction Stanfield Public Works and Wheatridge will enter into a contract to supply water for Project construction.

To provide you a bit more background on the project I'm attaching a link to our Notice of Intent (NOI), available on ODOE's website. If you have any questions or would like to talk about this further please call me anytime at your convenience. I appreciate your help this portion of our permit application and I look forward to speaking with you.

Sincerely,

Robert Friedel

Link to Wheatridge NOI on ODOE website: http://www.oregon.gov/energy/Siting/Pages/WRW.aspx

Robert Friedel - GISP
GIS Coordinator / Project Manager
direct: 503.721.7216 | cell: 541.231.9990
robert.friedel@tetratech.com

Tetra Tech, Inc.
1750 SW Harbor Way, Suite 400
Portland OR, 97201
Main: 503-221-8636
Fax: 503-227-1287
www.tetratech.com

Attachment O-4:

Record of Correspondence with PORT OF MORROW

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PORT OF MORROW

August 12, 2014

Tetra Tech, Inc.
Robert Friedel – GISP
GIS Coordinator / Project Manager
1750 SW Harbor Way, Suite 400
Portland OR, 97201

RE: Water Availability

Dear Mr. Friedel:

The Port of Morrow owns three Industrial Parks in Morrow County. One, is located in Boardman; another one is located six miles west of Boardman at the Port's Airport and one is near Heppner, at the old Kinzua Mill site. At each of those locations we have water that would available to sell to the Wheatridge Project.

In Boardman we have several wells and deliver water to many industries located here. We also purchase water from the City of Boardman on a contractual basis and resell to Industries.

With our water sources as well as our agreement with the City of Boardman, we would have adequate water supply to sell you the 6.5 million gallons per month from that system. We could also sell you that amount from the Airport system as well as the site in Heppner.

I have attached a list of the Water Rights that we have at the various locations. If you need any additional information, please don't hesitate to contact me, or our Port Engineer, Ron McKinnis.

Sincerely,

Gary Neal

Gary Neal,
General Manager

Water Rights Summary (subject water rights are shown in bold

Permit Number	Priority Date	Completion Date	Source of Water	Beneficial Uses	Quantity (cfs)
n Industrial Park					
G7158	4 Feb 1977	Certificate 8/14/95	Col. River Basin	Industrial	3.0
G8263	19 Jun 1978	Certificate 12/22/88	Col. River Basin	Industrial	1.11
G5332	19 Jan 1979	Certificate 1/19/79	Col. River Basin	Industrial	2.0
G10975	4 Dec 1989	Claim of beneficial use 9/27/95	Col. River Basin	Industrial	4.46
G12729	22 Jan 1993	Extension to 2007	Umatilla Basin	Municipal Irrigation	5.57 9.8
dustrial Park					
G13283	23 Oct 1996	Extension to 2012 pending	Col. River Basin	Municipal Irrigation	1.2 3.76
rrow Industrial Park					
G10312	8 Feb 1984	Claim of beneficial use 7/1/97	Willow Ck Basin	Municipal	0.5124
G4626	18 Jun 1969	Certificate 9/28/72	Willow Ck Basin	Municipal	0.09
G10312	8 Feb 1984	Claim of beneficial use 7/1/97	Willow Ck Basin	Municipal	0.2025
G4626	18 Jun 1969	Certificate 9/28/72	Willow Ck Basin	Municipal	0.14
G12370	14 Jan 1993	Extension to 2007 pending	Willow Ck Basin	Municipal	1.448

Exhibit P

Fish and Wildlife Habitats and Species

Prepared for

Wheatridge Wind Energy, LLC

Wheatridge Wind Energy Facility

July 2015

Prepared by

Northwest Wildlife Consultants, Inc.

and

Tetra Tech, Inc.

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Table of Contents

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Terms and Definitions

Applicant or Wheatridge	Wheatridge Wind Energy, LLC
Collector lines	34.5 kV lines conveying power from the turbines to the substation
Construction Yard	The temporary area for construction activities and Project equipment storage
Intraconnection Line(s)	Overhead electrical 230 kV line(s) connecting the Project substations in Wheatridge East and Wheatridge West.
Intraconnection Corridor	The intraconnection transmission line corridor connecting Wheatridge East with Wheatridge West
Gen-tie Line	230 kV line conveying power from the Project to an interconnection point with the grid; to be permitted/built by UEC or UEC/CB
Met tower	permanent meteorological tower
O&M building	Operations and Maintenance building
Project	Wheatridge Wind Energy Facility
Site access road	private roads constructed or improved for the purpose of accessing wind turbine sites and associated Project facilities
Site boundary	The boundary within which all Project facilities will be constructed, also known as the micrositing corridor
Substation	Facility in which power from the wind turbines is aggregated, stepped up in voltage, and connected into the Intraconnection Line(s) or the Gen-Tie Line(s)
Survey corridor	the survey corridor only
Turbine	A collective term for foundation, tower, nacelle, blades and rotor that comprise a wind turbine generator
Turbine pad	A cleared, graveled area around the base of each turbine
Wheatridge East	The eastern group of Project turbines
Wheatridge West	The western group of Project turbines

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1.0 Introduction

Wheatridge Wind Energy, LLC (Wheatridge), proposes to construct a wind generation facility (i.e., the Project) with a maximum nominal generating capacity of 500 megawatts (MW) in Morrow and Umatilla Counties, Oregon (see Figures C-1 and C-2). The Project is comprised of up to 292 wind turbines divided into two groups: the 'Wheatridge West' wind turbine group and the 'Wheatridge East' wind turbine group. Wheatridge West and Wheatridge East are electrically connected by an 'Intraconnection Corridor' containing up to two, parallel, overhead 230-kilovolt (kV) transmission lines (Intraconnection Lines), each no longer than 35 miles in length. Other Project components include on-site access roads, an electrical collection and control system, substations, operations and maintenance (O&M) buildings, and temporary construction yards. These facilities are described in greater detail in Exhibit B.

Wheatridge West is located entirely within Morrow County, approximately 5 miles northeast of Lexington, and approximately 7 miles northwest of Heppner. Wheatridge West is bisected by Oregon Highway 207 (OR-207). Wheatridge East is located approximately 16 miles northeast of Heppner and encompasses land in both Morrow and Umatilla counties. The Intraconnection Corridor is located entirely within Morrow County and adjoins the southeastern portion of Wheatridge West and the southern portion of Wheatridge East. This exhibit P provides information about non-listed, state-sensitive wildlife species and their habitats that might be affected by the proposed Project, as required to meet the submittal requirements of Oregon Administrative Rules (OAR) 345-021-0010(1)(p). This exhibit provides the information necessary for the Energy Facility Siting Council (EFSC, or the Council) to make a finding as required by OAR 345-022-0060:

> ***OAR 345-022-0060 Fish and Wildlife Habitat***
>
> *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 the fish and wildlife habitat mitigation goals and standards of OAR 635-415-0025 in effect as of September 1, 2000.*

1.1 Analysis Area

The analysis area for Fish and Wildlife Habitat is defined in the Project Order as "The area within the site boundary and within one-half mile of all ground-disturbing activities anticipated during construction, unless otherwise described in an ODFW- and ODOE-approved protocol." The Site Boundary is defined in detail in Exhibits B and C, and the above definition serves as a minimum for analysis areas used in this Exhibit P.

The information reviews and field studies described in this exhibit were predicated on the possibility of a much larger area being developed than that encompassed by the Site Boundary as now proposed. In some cases, the results of these wildlife surveys led the applicant to relocate facilities and reduce the size of the Project in order to avoid and/or minimize impacts to species of concern and their habitats.

At a minimum, information reviews covered the currently proposed site boundary and an area extending 5 miles beyond (10 miles for eagle nests) the site boundary. Similarly, whereas field surveys were conducted over much larger areas than the current site boundary, pedestrian surveys covered—at a minimum—all of the potentially suitable habitat where facilities are currently proposed and within a buffer of 1,000 feet. For greater detail on the scope of surveys, see individual study methods below or in the *Wheatridge Ecological Investigations Report* (Attachment P-1; Gerhardt and Anderson 2014).

1.2 Applicable Regulations

1.2.1 Oregon

The primary regulation guiding this exhibit is OAR 345-021-0010(1)(p). It delineates the required contents of Exhibit P.

OAR 345-022-0060 states that before issuing a site certificate, the Council must find that the design, construction, and operation of the proposed facility, taking into account proposed mitigation, are consistent with the fish and wildlife habitat goals and standards of OAR 635-415-0025.

OARs 635-415-0000 through -0025 establish the Oregon Department of Fish and Wildlife (ODFW) goals and standards for mitigating impacts to fish and wildlife habitats of such developments.

1.2.2 Federal

Those wildlife and plant species that are federally listed or candidate species and covered by the Endangered Species Act (16 USC 1531–1543) are addressed in Exhibit Q. Regulations governing the non-listed wildlife species addressed in this exhibit include the Migratory Bird Treaty Act (16 USC 703 through 711) and the Bald and Golden Eagle Protection Act (16 USC 668). The former protects all migratory birds, their nests, and eggs, and the latter adds specific additional protection for bald and golden eagles.

This exhibit and the reviews and studies described herein are also intended to follow the guidance found in *Oregon Columbia Plateau Ecoregion Wind Energy Siting and Permitting Guidelines* (USFWS 2008). That document describes the siting and permitting process for the relevant counties—Morrow and Umatilla—as well as for Gilliam, Sherman, and Wasco Counties.

The reviews and studies described in this exhibit were also designed according to the *Land-based Wind Energy Guidelines* (USFWS 2012a).

1.3 Nonlisted Species

As a requirement of OAR 345-021-0010(1)(p)(D), this exhibit includes the "identification of all State Sensitive Species that might be present in the analysis area and a discussion of any site-specific issues of concern to ODFW." State Sensitive Species are naturally-reproducing fish and wildlife species that are facing one or more threats to their populations and/or habitats (ODFW 2008). There are two subcategories: "Critical" species are those imperiled with extirpation from a

specific part of the state due to small population size, habitat loss or degradation, and/or immediate threats, whereas "Vulnerable" species are those facing one or more threats to their populations or habitats but not currently imperiled with extirpation. Species in either subcategory are protected under OAR 635 Div. 100.

Other species are addressed in this exhibit because they were considered during the biological studies described herein and, in some cases, affected the final design and layout of the proposed Project. These other non-listed species include eagles and federal Species of Concern. Both the bald and golden eagle are protected under the Bald and Golden Eagle Protection Act (16 USC 668), and the bald eagle is a delisted species (previously listed both federally and by ODFW, with those listings since deemed no longer warranted). Federal Species of Concern are species whose conservation is of concern to the United States Fish and Wildlife Service (USFWS) but for which sufficient status information is unavailable. All such bird species are protected under the Migratory Bird Treaty Act (16 USC 703 through 711); otherwise, these species receive no legal protection by virtue of their being designated Species of Concern. There is some overlap between State Sensitive Species and federal Species of Concern.

Complete lists of terrestrial vertebrate and bat species of concern (including listed species) with the potential for occurrence on or near the Project can be found as Appendices C and D of Attachment P-1. It is understood that Project facilities and construction activities will avoid aquatic habitats (as described in Exhibit J). Therefore, fish habitat, amphibian breeding habitat, and potential wetland-associated rare plants were not addressed during field surveys (although fish, amphibians, and wetland plants were addressed during information reviews).

Finally, mule deer, which have no special status but are of management concern to ODFW, are addressed in this exhibit because a portion of the Project lies within designated mule deer winter range (Figure P-1; ODFW 2013); this has an effect on the amount of habitat mitigation that will be required.

1.4 Agency Consultation

Consultation and communication with personnel from the Oregon Department of Fish and Wildlife and the United States Fish and Wildlife Service regarding the presence on and use of the Project area by sensitive species included the following:

- The investigations components overview (study plan; NWC 2012) was submitted by the Applicant to ODFW District Biologist Steve Cherry (of the Heppner District office) and to personnel at the La Grande field office of the USFWS in early August 2012.
- These study components were discussed during a site tour held June 29, 2011 (when the Project was part of a larger proposed project). Agency personnel present included Steve Cherry (ODFW) and Suzanne Anderson and Gary Miller (USFWS).
- Another site tour was conducted on August 20, 2012; Steve Cherry and Suzanne Anderson were again present.
- Results of wildlife studies were presented to USFWS personnel (Suzanne Anderson, Gary Miller, and Matthew Stuber) at a meeting in LaGrande on February 20, 2014.

- The *Wheatridge Ecological Investigations Report* (Gerhardt and Anderson 2014) was submitted to ODFW and USFWS in early October 2014.

2.0 Identification of Species

2.1 Initial Desktop Review

A review of available literature and other resources was conducted to identify the rare plant and special status vertebrate wildlife species potentially occurring within the general Project area. This section focuses on information obtained before field studies were conducted. Records of rare, Threatened, and Endangered plant and wildlife species were requested from the Oregon Biodiversity Information Center (ORBIC; Appendix A of Attachment P-1). Also accessed were the USFWS county-level special status species lists for Morrow and Umatilla Counties (USFWS 2012b and c; also found as Appendices B1 and B2 of Attachment P-1). Other information was obtained from various sources, including ODFW, and raptor nest information was reviewed and records placed in a confidential nest database. Data from these inquiries were used in conjunction with other information (e.g., results of ongoing surveys of the area, interviews with ODFW biologists, NWC staff biologists' knowledge, Oregon Eagle Foundation data requests) to develop lists of special-status plant and vertebrate wildlife species with potential for occurrence in the Project area.

These pre-field reviews enabled the answering of the questions in Tier 1 (preliminary site evaluation) and Tier 2 (site characterization) of the *Land-based Wind Energy Guidelines* (USFWS 2012a) and provided Wheatridge Wind Energy, LLC with the information relevant for making the decisions associated with each of these tiers as well as for meeting EFSC project permitting standards. The resulting lists of species of concern with the potential for occurrence in the area were then used to inform the design and timing of field studies (addressed in the guidelines under Tier 3) used to document the wildlife and habitats on the Project, to enable the predicting of Project impacts to species of concern and their habitats, and to facilitate avoidance and minimization of impacts during Project design, micrositing, construction, and operation. The *Wheatridge Ecological Investigations Report* (Gerhardt and Anderson 2014, which is found as Attachment P-1) is formatted to answer the questions in those guidelines.

2.1.1 Oregon Biodiversity Information Center

Records of rare, Threatened, and Endangered plant and wildlife species were requested from ORBIC in early 2011 and received by NWC on March 18, 2011. The area for which records were requested was the Project and a 10-mile (16.12 km) buffer of the Project boundary (as of March 2011). The 10-mile buffer was specifically to obtain historical information on nesting by bald and golden eagles. All information received, including records at distances greater than 5 miles from the current Project boundary, were reviewed to aid in compiling lists of vertebrate wildlife, bat, and plant species (Appendices C, D, and E, respectively, of Attachment P-1) with potential for occurrence in the general area.

2.1.2 United States Fish and Wildlife Service Morrow and Umatilla County Species Lists

The USFWS lists of Endangered, Threatened, Proposed, and Candidate species, and Species of Concern for Morrow and Umatilla Counties were accessed in March 2011 and again in December 2012; the December 2012 versions can be found as Appendices B1 and B2 of Attachment P-1. The lists encompass a range of habitats within each entire county, including some species that have no potential for occurrence within or near the Project boundary. The Wheatridge East turbine group lies partly in Morrow County and partly in Umatilla County; the Wheatridge West turbine group and the intraconnection corridor lie entirely within Morrow County, though the eastern edge of the intraconnection corridor is within 5 miles of Umatilla County.

2.1.3 Review for Information on Eagles

The bald eagle and golden eagle—though not listed or state sensitive species—are protected under the federal Bald and Golden Eagle Protection Act (BGEPA; 16 U.S.C. 668-668c, 1940). Golden eagles are the subject of concern by the USFWS with regard to the construction and operation of wind energy projects, and so both species are addressed in this exhibit. NWC conducted a review for nest records within 10 miles of the Project. Bald eagle nest data were obtained as well. Nest information available from studies of nearby wind projects (provided by ODFW), state records, NWC personal records, local bird group records, and ORBIC were reviewed.

ORBIC does not actively track golden eagles or their nest sites, but information on this species is available from their Point of Observation Database (PODS), a repository for information on less-rare vertebrates in Oregon begun in 2006. PODS was checked for records of golden eagle nests within 10 miles of the Project boundary. Many of these observations were reported to ORBIC PODS by the Oregon Breeding Bird Atlas, which ranks detections by three categories—possible breeding, probable breeding, or confirmed breeding. The Oregon Breeding Bird Atlas does not report the actual geographic location of observations, but rather reports all observations within a hexagon sample unit at the center of that hexagon. Each hexagon covers an area of 634.5 km^2 (245 mi^2, or 156,000 acres), has six sides each with a length of 15.8 km (9.8 mi), and measures 27.4 km (17.0 mi) perpendicularly from side to side (Adamus et al. 2001). Given the coarse nature of this reporting method, it is impossible to ascertain if any of the golden eagle observations reported to ORBIC PODS by the Oregon Breeding Bird Atlas actually occurred within the 10-mile buffer of the Project boundary. These data provide only corroborative evidence of historical use and breeding in the general area by golden eagles.

2.1.4 Review for Information on Bats

A habitat assessment and review of databases, published literature, and industry reports was conducted. NWC biologists with experience in studying bats reviewed the full range of Project habitats to determine species likely present at the Project. In addition, bat fatality monitoring

results from regional wind projects were reviewed to help assess mortality rates with respect to species likely present at the Project.

2.1.5 Species with Potential for Occurrence

The literature reviews described above led to a list of all federal Endangered, Threatened, or Candidate Species or Species of Concern and all state Endangered, Threatened, or Candidate Species or Sensitive (Critical or Vulnerable) species, whether fish, terrestrial vertebrate wildlife, bats, or plants (Appendices C, D, and E of Attachment P-1). State and Federal Endangered, Threatened, and Candidate Species are addressed in Exhibit Q. State Sensitive Species, federal Species of Concern, and eagles deemed (prior to field surveys) to have potential for occurrence on the Wheatridge Wind Energy Facility are the following (no plant species fit these criteria):

- Margined sculpin (*Cottus marginatus*; federal Species of Concern)
- Inland Columbia Basin redband trout (*Oncorhynchus mykiss gairdneri*; Sensitive-Critical)
- Pacific lamprey (*Lampetra tridentata*; Sensitive-Vulnerable, Species of Concern)
- California myotis (*Myotis californicus*; Sensitive-Vulnerable)
- Small-footed myotis (*Myotis ciliolabrum*; Species of Concern)
- Long-eared myotis (*Myotis evotis*; Species of Concern)
- Fringed myotis (*Myotis thysanodes*; Sensitive-Vulnerable; Species of Concern)
- Long-legged myotis (*Myotis volans*; Sensitive-Vulnerable, Species of Concern)
- Yuma myotis (*Myotis yumanensis*; Species of Concern)
- Hoary bat (*Lasiurus cinereus*; Sensitive-Vulnerable)
- Silver-haired bat (*Lasionycteris noctivagans*; Sensitive-Vulnerable, Species of Concern)
- Spotted bat (*Euderma maculatum*; Sensitive-Vulnerable, Species of Concern)
- Townsend's big-eared bat (*Corynorhinus townsendii*; Sensitive-Critical, Species of Concern)
- Pallid bat (*Antrozous pallidis*; Sensitive-Vulnerable, Species of Concern)
- White-tailed jackrabbit (*Lepus townsendii*; Sensitive-Vulnerable)
- Northern goshawk (*Accipiter gentilis*; Sensitive-Vulnerable, Species of Concern)
- Swainson's hawk (*Buteo swainsoni*; Sensitive-Vulnerable)
- Ferruginous hawk (*Buteo regalis*; Sensitive-Critical, Species of Concern)
- Golden eagle (*Aquila chrysaetos*; Bald and Golden Eagle Protection Act)
- Bald eagle (*Haliaeetus leucocephalus*; Bald and Golden Eagle Protection Act)
- Peregrine falcon (*Falco peregrinus*; Sensitive-Vulnerable)
- Mountain quail (*Oreortyx pictus*; Species of Concern)
- Greater Sandhill crane (*Grus canadensis tabida*; Sensitive-Vulnerable)
- Long-billed curlew (*Numenius americanus*; Sensitive-Vulnerable)
- Burrowing owl (*Athene cunicularia*; Sensitive-Critical, Species of Concern)
- Lewis' woodpecker (*Melanerpes lewis*; Sensitive-Critical, Species of Concern)
- White-headed woodpecker (*Picoides albolarvatus*; Species of Concern)
- Olive-sided flycatcher (*Contopus cooperii*; Sensitive-Vulnerable, Species of Concern)

- Willow flycatcher (*Empidonax trailii adastus*; Sensitive-Vulnerable, Species of Concern)
- Loggerhead shrike (*Lanius ludovicianus*; Sensitive-Vulnerable)
- Yellow-breasted chat (*Icteria virens*; Species of Concern)
- Sagebrush sparrow (*Artemisiospiza nevadensis*; Sensitive-Critical)
- Grasshopper sparrow (*Ammodramus savannarum*; Sensitive-Vulnerable)
- Tricolored blackbird (*Agelaius tricolor*; Species of Concern)
- Sagebrush lizard (*Sceloporus graciosus*; Sensitive-Vulnerable, Species of Concern)
- Western painted turtle (*Chrysemys picta*; Sensitive-Critical)

2.2 Description of Field Surveys Performed – OAR 345-021-0010(1)(p)(A)

2.2.1 Wildlife Habitat Mapping and Categorization

Biologists familiar with Columbia Plateau habitat types and wildlife used a combination of deer and elk winter range information, historical land cover data, color aerial image interpretation, topographic information, soil data, and on-site verification to characterize the range of habitat types present within the Project boundary from the perspective of wildlife use, both general (for species assemblages, e.g. shrub-steppe obligates) and specific (for individual taxa, i.e., special status species).

Habitat types and subtypes within the Project boundary were mapped according to current vegetation rather than according to the potential ecological climax for any given location. Habitat was mapped at the major plant community level utilizing a combination of in-office and on-site delineations. All habitats represented in the Project boundary were field-assessed at some point during the habitat mapping/wildlife survey periods.

Initial habitat boundaries were delineated at a scale of 1:5,000 in a digital geographic information system (GIS) using NAIP 1-meter resolution orthophoto quadrangle county mosaics (USDA-FSA 2009; USDA-FSA 2011; USDA-FSA 2012), digital raster graphics of standard series U.S. Geological Survey (USGS) topographic maps, and the Natural Resources Conservation Service (NRCS) soil survey geographic database (USDA NRCS 2010). Initial boundaries were delineated based on obvious differences in vegetation, land form, and land use. NWC biologists then ground-verified and adjusted boundaries, further delineated habitat types and subtypes, and developed detailed descriptions of each habitat subtype.

Within a 1000-ft buffer of proposed facilities, limited to the extent of the Project boundary, habitat subtypes were described in further detail, including ecological condition, and rated for habitat quality (Categories 1–6) based on definitions found in Oregon Administrative Rule (OAR) 635-415-0025. This rule defines six habitat categories and establishes mitigation goals and implementation standards for each.

Category	Habitat Characteristics
1	Irreplaceable, essential and limited
2	Essential and limited
3	Essential, or important and limited
4	Important
5	Having high potential to become either essential or important
6	Low potential to become essential or important

In 2013, ODFW policy began to consider all designated deer and elk winter range to be Category 2 habitat (essential and limited) regardless of habitat type and quality (ODFW 2013), active agriculture and other developed habitats excepted. That is, within big game winter range, habitat type, quality, and usefulness to other wildlife—including Sensitive species—are no longer factors in categorizing habitat. Because of the timing of the habitat mapping efforts at this Project, the methods of ground verification and careful delineation of habitat types , quality, and usefulness to wildlife described above were, in fact, followed throughout the Project Area. For those areas that lie within big game winter range, however, those methods were made unnecessary—and the results were countermanded—by the change in ODFW policy. In this report (and in the Habitat Mitigation Plan), all lands within deer and elk winter range are considered Category 2 regardless of habitat type, quality, and usefulness to other wildlife, except active agricultural lands (which are deemed Category 6) and lands that are Category 1 by virtue of the presence of Washington ground squirrels.

2.2.2 Avian Use Survey

Field Methods

Avian use surveys were conducted during diurnal hours using a variable circular-plot method to obtain information on species composition and relative abundance of birds (Reynolds et al. 1980) and flight altitudes. Each plot was surveyed for an entire year, and results were analyzed by season.

Survey protocol was similar to that used at other CPE wind energy developments, including Echo Wind Farms (Gritski and Kronner 2010a), Rattlesnake Road Wind Farm (Kronner et al. 2007a), Wheat Field Wind Farm (Kronner et al. 2008a), Willow Creek Wind Project (Kronner et al. 2007b), Leaning Juniper Phase 1 and Phase II Wind Projects (Kronner et al. 2005a; NWC 2009), and White Creek Wind Project (Kronner et al. 2005b). Studies on these projects involved recording every avian detection (regardless of distance), though only data from within 800 meters (≈0.5 mile) were used for the analyses. Although this survey is primarily designed for studying use by large birds (i.e., waterfowl and raptors), information for all species observed was recorded.

Twenty-four 800-meter (approx. 0.5-mile) radius study plots were established (16 associated with the Wheatridge West turbine group and eight associated with the Wheatridge East turbine group) in such a distribution as to provide good coverage of the habitat types and variation in topography of the Project area, inclusive of the proposed turbine strings (Figure P-2). Plots were non-

overlapping, and were chosen to provide excellent viewing conditions and thorough sampling of the proposed turbine strings. Experienced observers positioned at the center of the plot recorded all wildlife seen or heard during 20-minute point counts. Species, number, flight height, weather, habitat association, behavior and other general data were recorded. Survey starting point locations and times of the day were alternated among surveys to reduce spatial and temporal bias. On occasion, one or more plots were not surveyed in a given week due to weather or access constraints or other conditions.

Survey dates for each season were:

- Winter: January 30–March 12, 2011; October 30–February 11, 2012
- Spring: March 13–May 28, 2011
- Summer: May 29–August 13, 2011
- Fall: August 14–October 29, 2011

In all, 1,229 20-minute avian use surveys were conducted between January 30, 2011 and February 11, 2012 (823 surveys associated with the Wheatridge West turbine group and 406 surveys associated with the Wheatridge East turbine group). By season, there were 443 winter surveys, 262 spring surveys, 261 summer surveys, and 263 fall surveys.

Flight paths of species of interest (including raptors and some special status species) were hand-plotted on topographic maps in the field. Detections of special status species or species of interest (such as raptors) were recorded while the surveyor traveled between survey plots. Eagle flight paths were inspected, and then digitized into a GIS. Exposure minutes (time spent flying within 800 meters of the plot center and within 200 meters of the ground) were recorded for all eagles detected during avian use surveys (as outlined in USFWS 2011).

Data Analysis

Avian-use metrics found in other studies in the region (as mentioned above) were used in conducting the analyses for this Project. In all data analyses, only observations ≤800 m from the plot center were used. Standardized metrics were computed for avian species and species-groups; these included mean use, percent composition, and frequency of occurrence. Because Project avian use surveys were conducted during four consecutive seasons, analyses are comparable to analyses performed for other regional proposed wind projects, many of which are now permitted and operational, and for some of which avian fatality monitoring studies are completed. These comparisons facilitate appropriate assessments of the potential risk to avian species of the proposed Project. Such comparisons will, of course, involve region-wide differences among years (in species numbers) that cannot be controlled for or quantified.

2.2.3 Raptor Nest Survey

The objective of raptor nest surveys was to provide information that can be used to predict potential impacts to nesting raptors and to identify options for minimizing, avoiding, or mitigating impacts. Impacts to nesting raptors can potentially occur during the construction or operations

phase of the Project, and may include displacement, disturbance during nesting, direct loss of the nest structure, or collision with turbine rotors by individual breeding birds or fledged young.

A raptor biologist and a helicopter pilot experienced at this type of survey flew over the survey area, which included the area proposed for development plus a 2-mile (3.2-kilometer) buffer of proposed turbines to locate active and inactive raptor nests (Figure P-3). (A larger area was surveyed for eagle nests, as described in Section 3.6 below.) The entire area was surveyed in May, when the majority of large raptor species could be expected to be nesting. Helicopter flight paths avoided occupied dwellings, livestock areas, and restricted zones.

All appropriate nesting areas, including trees, rock formations, and transmission line towers, were flown to provide complete coverage of the survey area. All potential and confirmed raptor nests were recorded, regardless of activity status. Determination of nest status (active, inactive, unknown) was made using a combination of visual clues, such as adult behavior, presence of eggs or young, presence or absence of whitewash (excrement), or observational data from the other surveys being conducted on the Project. Stick nests that appeared to have been constructed and used by common ravens were recorded because these structures could be used by raptors in future years. All nest locations were recorded using a hand-held Global Positioning System (GPS) receiver, and all data were entered into a GIS database.

Aerial surveys are not an effective method to detect the nests of ground-nesting raptors (northern harrier and burrowing and short-eared owls) and some cavity-nesting raptors (American kestrel and small owl species). Surveyors recorded the nests of ground-nesting and cavity-nesting raptors detected while conducting onsite ground-based surveys (described in Section 2.2.7).

Raptor nest surveys were completed for all components of the proposed Project (Wheatridge West turbine group, Wheatridge East turbine group, and the transmission intraconnection corridor) during the 2011 raptor breeding season. For the Wheatridge West turbine group and the intraconnection corridor, supplemental surveys were conducted in 2012 and 2013 to locate raptor nests on and within two miles of some small areas that had been added to the Project subsequent to the 2011 survey. In addition, information on nesting by special status raptor species was obtained during other 2012 and 2013 field surveys in portions of the Project for which the raptor nest survey was completed in 2011.

2.2.4 Eagle Nest Survey

Surveys for nests of eagles were conducted in accordance with specific protocols (Pagel et al. 2010). An initial aerial survey was conducted in March 2011, encompassing the Project area and the area within a 10-mile (16.2-kilometer) buffer of the proposed turbines (Figure P-3). The area surveyed included all potential eagle nesting habitat, such as cliffs, large trees, and transmission towers. The March survey effort focused on eagle nests; accordingly, only eagle nests were recorded in the area between 2 and 10 miles from the Project, whereas within the 2-mile buffer other active raptor nests were also recorded when discovered. All eagle nests, active and inactive, were recorded (as described in Section 2.2.3 above). Inactive nests were identified as those of eagles based on size,

structure, and placement (and the raptor biologist's 30+ years of experience with the species and other nesting raptors).

In conjunction with the May multi-species raptor nest survey (described in Section 2.2.3), all active eagle nests identified on the March eagle nest survey were monitored from the air, unless nesting success was monitored effectively from the ground. A third aerial survey—to ascertain productivity—was conducted in June; a breeding attempt was deemed successful if one or more eaglets were observed at an age of 51 days or more (Pagel et al. 2010).

2.2.5 Golden Eagle Nest Monitoring

All eagle nests identified in 2011 were monitored in 2012, in 2013, and again in 2014. This included aerial monitoring where necessary and ground monitoring where possible. As discussed with ODFW and USFWS, the 2012–2014 efforts were not surveys of all suitable nesting habitat (as in 2011); however, in those nesting territories where nests identified in 2011 were found to be inactive or no longer present, additional searching was conducted to try to ascertain if a new nest had been built and was being used. Monitoring of nests found active followed the same protocol as described in Section 2.2.4. The first monitoring effort was conducted in early April each year; the second flight was in early June each year, with additional ground monitoring visits conducted periodically at accessible territories.

2.2.6 Golden Eagle Telemetry Studies

To complement the avian use studies in understanding the use of the Project by golden eagles, Wheatridge authorized telemetry studies of eagles at the active nest nearest to the Project. The objective was to telemeter the resident adult male and a juvenile produced at this nest. Obtaining diurnal locations for the adult male allowed the mapping of an estimate of his home range (and by extension that of the pair), information useful in micrositing of facilities to avoid or minimize impacts. Understanding the natal home range of young is desirable, since there has been concern of the possibility that the period after fledging but prior to dispersal is a time when young eagles—as they are learning to fly and hunt—may be vulnerable to collision with turbines. Thus, the telemetry information from a young bird that is most relevant to the Project is that obtained prior to dispersal from the territory of origin, which generally occurs four to six months after fledging. Telemetry also can provide opportunity to learn about dispersal movements and to determine cause of death (should the subject bird die while still wearing a working transmitter).

Trapping of the adult male took place during the winter, prior to the onset of incubation. The juvenile was captured by climbing into the nest just prior to its fledging. To each target bird, a platform terminal transponder (PTT; solar-powered satellite telemetry unit) was affixed as a backpack. Life expectancy of the PTT is a minimum of two years, during which time hourly diurnal locations are uploaded to satellites approximately every three days and subsequently accessed by NWC personnel. A uniquely-numbered, USGS aluminum band was affixed to the right leg of each telemetered eagle. Standard measurements were taken of the adult; the foot span was measured to verify the sex of the adult and to determine the sex of the young eagle. (All trapping and handling of

eagles was performed by NWC biologists with all of the federal and state permits governing these activities and with years of experience working with this species.)

Home range size and shape (year-round for the adult; natal area for the young) were estimated using fixed kernel estimators (Seaman and Powell 1996). Results will be reported in separate documents, and will be used to assess the potential risks of the Project to golden eagles and to inform a Project-specific eagle conservation plan or bird and bat conservation plan, as applicable.

2.2.7 Special Status Vertebrate Wildlife Species Survey

Methods for confirming the presence of special status vertebrate wildlife species during the breeding season were developed by NWC using the extensive background and experience of its staff, informal consultation with local ODFW biologists over a 20-year period, and suggested methods in the Oregon Methodology Manual (ODFW 1994). NWC biologists and technicians walked meandering transects, concentrating on appropriate habitat structure and quality, approximately 50 meters to 70 meters (164 to 230 feet) apart. Surveys were conducted within all habitat suitable for target species within specific corridors at least 2,000 feet wide inside the Project boundary (Figure P-4). Areas unsafe for walking, non-suitable habitat (dryland wheat areas), and residential areas were excluded from surveys. Rocky cliffs were surveyed and scanned from above and below, where appropriate.

Surveys were conducted from March through early June during diurnal periods of sunrise to early afternoon during time and weather conditions that were most suitable for detection of breeding birds and mammals. Surveys continued into the early afternoon, if needed, to survey for the potential of special status reptile species during a warmer period of the day. Aquatic habitats were not surveyed for aquatic species (fish and amphibians), because it was assumed these habitats would be avoided during Project facility design (i.e., there would be no temporary or permanent impacts to aquatic habitats).

All vertebrate wildlife observed were recorded. Special status species locations were recorded with a handheld GPS receiver. Maps were generated in a GIS environment to assist in the micro-siting process.

Since there were no federal listed terrestrial vertebrate species with potential for occurrence on the Project, target species included Oregon State listed or Sensitive Species and federal Species of Concern that were believed to have potential for occurrence during the breeding season based on range and habitat associations and NWC's local knowledge and experience (see Section 2.1 of this exhibit and Appendix C of Attachment P-1). Only the Washington ground squirrel is State Listed (Endangered status); as such, it is addressed in Exhibit Q; the others are State Sensitive and addressed in this document. Other species of general concern that may use the site for nesting (raptors) were surveyed from the air (see Raptor Nest Survey, Section *2.2.3*) or noted incidentally while conducting other ground-based surveys. Several bat species also have special ODFW status and some are federal Species of Concern; bat reviews and bat species investigation methods are addressed separately in Section *2.2.8*).

Because of the potential for occurrence on the Project of State Endangered Washington ground squirrels (addressed in Exhibit Q), these special status wildlife species surveys were conducted twice in suitable habitat, following ODFW protocols for detecting this species; these occurred between early March and early June. Supplemental surveys (for areas leased for potential development after spring 2011) were conducted in spring 2012 and 2013.

2.2.8 Bat Species Investigation

NWC conducted a ground level, habitat-based bat species inventory. The primary goal of the study was to investigate bat species diversity within the Project boundary using acoustic monitoring equipment. The objectives were to: (1) field-collect baseline information on bat species presence during a specific seasonal period in specific areas and (2) examine spatial (landscape) and temporal (seasonal) bat species composition at various habitat areas within the Project boundary. Specifically, this inventory was expected to verify the occurrence on the Project of two species of concern—hoary bat and silver-haired bat—whose presence was expected from the results of the information review (Section 2.1) and to determine whether other species of concern (such as Townsend's big-eared bat) were present.

Field investigations were conducted between the first week of July and the last week of October 2011. These dates represent the period of the year during which the majority of bat fatalities at turbines are known to occur in the Pacific Northwest and other regions (NWCC 2010).

Six Pettersson D500x ultrasound detector/recorders capable of recording the echolocation calls of bats onto compact flash cards (CF cards) were housed in protective cases and located appropriately to blend in with the environment. Each of the six detectors was rotated between primary and alternate locations every other week to yield a total of 12 sampling sites throughout the seasonal period (shown in Figure P-5 and described in Table P-1).

Downloaded calls were analyzed using SonoBat® 3.05 acoustic identification software to identify and delete unusable files (those containing only background/ambient/insect noise) and then identify bat species where possible. For recordings where species identification was unclear, the call was manually verified or rejected.

Calls were sorted by quality of recording. Calls without sufficient diagnostic characteristics were not analyzed further, and the remaining calls were compared with previously recorded calls from bats of known species at other sites (library files within SonoBat™ or personal NWC library of calls from Morrow, Umatilla, and Gilliam Counties). Interpretation of bat detector calls can sometimes result in error due to call overlap among some myotis species (e.g., California myotis and Yuma myotis) and among three other species (big brown, silver-haired, and hoary bats). A conservative approach—one that used only complete calls that showed a consistent minimum frequency—were used for identifying bats to the species level. Calls not verifiable to species were grouped as either high frequency or low frequency.

Table P-1: Bat Monitoring Station Habitat Descriptions		
Station	**Project Portion**	**Situation and Habitat**
1A	Wheatridge West	On rimrock; in Sagebrush Shrub-steppe
1B	Wheatridge West	Facing water trough in stockade; in Exotic Annual Grassland
2A	Wheatridge West	On dead tree over creek; in Sagebrush Shrub-steppe
2B	Wheatridge West	On fence post next to old barn; in Developed-Other habitat
3A	Wheatridge West	On fence post next to grove of trees; in Revegetated Grassland
3B	Wheatridge West	On fence post near trees, trough; in Native Perennial Grassland
4A	Wheatridge East	On old windmill; in Native Perennial Grassland
4B	Wheatridge East	On fence post; in Exotic Annual Grassland
5A	Wheatridge East	On met tower; in Exotic Annual Grassland
5B	Wheatridge East	On old windmill leg; in Native Perennial Grassland
7A	Intraconnection Corridor	On willow near creek; in Riparian habitat
7B	Intraconnection Corridor	On fencepost next to tree; in Riparian habitat

2.2.9 Special Status Plant Survey

Surveys were conducted to identify the presence and location of any special status vascular plant species found on the Project, specifically within anticipated development areas. Target species for the purposes of this survey included all possible Oregon Department of Agriculture (ODA) Candidate, Threatened, and Endangered taxa considered likely to occur in the general region around Wheatridge (Appendix E of Attachment P-1; there were no Federal Listed or Candidate plant species with likely occurrence). In addition, rare species lacking Federal and State status but which are actively tracked as being rare by ORBIC (2010) were also included in the target list. None of the target species were state Sensitive. The timing for these surveys was based on review of the database search results, and incorporated NWC's extensive local knowledge of target vascular plant species and their typical phenology.

Rare plant surveys were conducted by botanists familiar with Columbia Plateau Ecoregion flora; most surveys occurred in 2011, but supplemental surveys occurred in 2012 and 2013. Surveys were conducted in suitable habitat within corridors covering an area extending 500 feet outwards from proposed facilities (in general, a 1,000-foot wide survey corridor for linear facilities). Searches used an intuitively controlled survey method (Elzinga et al. 1998) where all survey corridors were sufficiently traversed to locate all habitats of high suitability for target plant species. Once located, survey efforts intensified within these high suitability habitats, with surveyors walking transects that allowed complete coverage for finding special status plant taxa. This technique provided full coverage of all habitats within survey corridors while allowing field investigators to thoroughly assess all areas that might harbor target vascular plant species. This technique is standard survey

protocol for "Survey and Manage" vascular plant species on USDA and USDI lands (USDI BLM and USDA FS, 1999), and has been employed with success at other NWC investigations. During the survey, investigators compiled a list of all vascular plant species encountered (Appendix F of Attachment P-1).

The primary flora reference employed for the field effort was Hitchcock and Cronquist (1973), with supplemental texts from the 5-volume Flora of the Pacific Northwest (Hitchcock et al., 1955–1969) used as necessary.

3.0 Identification and Description of Habitat – OAR 345-021-0010(1)(p)(B)

3.1 Description of Habitat Types and Categories within the Analysis Area

Habitat types and subtypes found within the assessed area are listed below by category (and are shown as Figures 3a, b, and c and 4a, b, and c of Attachment P-1). Included are descriptions of the habitat types and subtypes and brief discussions of wildlife species typically associated with each. No Category 5 habitat was found within the assessed areas. Habitat categories are defined in Section *2.2.1*.

Category 1 Habitat

Washington ground squirrel sites are considered Category 1 habitat. In addition, all habitat suitable for this species within a 785-foot buffer of sites is also defined as Category 1 habitat. Examples of habitat breaks that would cause the 785-foot buffer to be truncated are tilled field edges or unvegetated, continuous vertical drop rim rock which has no burrowing or food value to Washington ground squirrels choosing to explore a given area. Small linear unvegetated inclusions into otherwise suitable habitat that were determined not to present a barrier to Washington ground squirrel use were not considered habitat breaks.

Washington ground squirrels were observed or sign of their use was confirmed in four habitat subtypes during Wheatridge wildlife surveys: these are Exotic Annual Grassland, Native Perennial Grassland, Basin Big Sagebrush Shrub-steppe, and Rabbitbrush/Snakeweed Shrub-steppe. The process of survey, detection, and delineation was used to ensure that all Project facilities were subsequently sited to avoid Category 1 habitats. These habitats are described below, but none will be permanently or temporarily impacted by Project facilities.

Grassland

Washington ground squirrels were detected in two subtypes of Grassland within areas of survey, Exotic Annual and Native Perennial. Grassland habitat was also present within 785 feet of WGS burrows.

Category 1 Exotic Annual Grassland is similar in vegetative cover and ecological condition to the immediately adjacent Category 4 Exotic Annual Grassland. Category 1 Exotic Annual Grasslands are categorized as Category 1 where they are within 785 feet of documented Washington

ground squirrel burrows. White-tailed jackrabbit, long-billed curlew, and burrowing owl may use this habitat.

Category 1 Native Perennial Grassland is similar in vegetative cover and ecological condition to the immediately adjacent Category 3 or Category 4 Native Perennial Grassland. Native Perennial Grasslands are categorized as Category 1 where they are within 785 feet of documented Washington ground squirrel burrows. Category 1 Native Perennial Grasslands provide essential foraging habitat to a variety of common resident and migratory birds and common mammals. State Sensitive species that use this habitat include white-tailed jackrabbit, long-billed curlew, and grasshopper sparrow. Native grasses and forbs provide forage for mule deer during all seasons of the year. Native Perennial Grassland is an ODFW conservation strategy habitat (ODFW 2006).

Shrub-steppe

Washington ground squirrels were detected in two subtypes of Shrub-steppe within the Project boundary, Basin Big Sagebrush Shrub-steppe and Rabbitbrush/Snakeweed Shrub-steppe. Shrub-steppe habitat was also present within 785 feet of Washington ground squirrel burrows.

Category 1 Basin Big Sagebrush Shrub-steppe is similar in vegetative cover and ecological condition to the immediately adjacent Category 2 and 3 Basin Big Sagebrush Shrub-steppe. Basin Big Sagebrush Shrub-steppe is categorized as Category 1 where it is within 785 feet of documented Washington ground squirrel burrows. In addition to providing essential habitat for Washington ground squirrels, Category 1 Basin Big Sagebrush Shrub-steppe offers high quality breeding habitat for shrub obligate species including loggerhead shrike, and may support white-tailed jackrabbit. Sagebrush lizard may be found in areas where sandy soils are present. This habitat provides year-round cover for mule deer. Basin Big Sagebrush-Shrub-steppe is an ODFW conservation strategy habitat (ODFW 2006).

Category 1 Rabbitbrush/Snakeweed Shrub-steppe is similar in vegetative cover and ecological condition to the immediately adjacent Category 3 or Category 4 Rabbitbrush/Snakeweed Shrub-steppe. Rabbitbrush/Snakeweed Shrub-steppe is categorized as Category 1 where it is within 785 feet of documented Washington ground squirrel burrows. In addition to providing essential habitat for Washington ground squirrels, Category 1 Rabbitbrush/Snakeweed Shrub-steppe provides foraging, cover, and/or nesting habitat for common birds and mammals, and may support white-tailed jackrabbit.

Category 2 Habitat

Outside of big game winter range, two habitat types were identified as Category 2 within the wildlife survey areas at Wheatridge; these are Escarpment and Basin Big Sagebrush Shrub-steppe.

Exposed Rock

Category 2 Exposed Rock provides important habitat for a variety of vertebrates, including birds, mammals (including bats), and reptiles. There is one Category 2 subtype of Exposed Rock, Escarpment, within wildlife survey areas associated with the Project.

Category 2 Escarpment consists of linear basalt outcroppings on the shoulders of steeper canyons or on the edges of canyons. Soils are absent or very shallow, and what vegetative cover is present consists of Sandberg's bluegrass, non-native grasses, and various native and non-native forbs. This habitat provides critical nesting substrate and perching sites for raptors and passerines, and roosting crevices for bats. Escarpment provides shade, escape cover and thermal cover for mule deer. It also provides home sites for woodrats and marmots and for several snake species, and all of these in turn represent important prey for a variety of raptors.

Although Escarpment was found in portions of the areas surveyed for wildlife, none of this habitat type is present within the Site Boundary in quantities large enough to be mapped, and so no permanent or temporary impacts will occur.

Shrub-steppe

Shrub-steppe is classified as Category 2 where it provides essential habitat to special status species such as loggerhead shrike. There is a single subtype of Category 2 Shrub-steppe, Basin Big Sagebrush Shrub-steppe.

The Category 2 Basin Big Sagebrush Shrub-steppe consists of an overstory of mature (large structure) patches of basin big sagebrush. Understory plants consist of a mix of native bunchgrasses and exotic annual grasses depending largely on level of impact from disturbance. Common grasses are Sandberg bluegrass, bluebunch wheatgrass, cheatgrass, and bulbous bluegrass. Category 2 Basin Big Sagebrush Shrub-steppe has a higher shrub density and greater plant health than similar but lesser quality Category 3 Basin Big Sagebrush Shrub-steppe habitat. This habitat subtype is found on deep soils in portions of the Project, usually on slopes or in draws that prevent agricultural use. Category 2 Basin Big Sagebrush Shrub-steppe offers high quality breeding habitat for shrub obligate species including loggerhead shrike, and may support Washington ground squirrel and white-tailed jackrabbit. Sagebrush lizard may be found in areas where more sandy soils are present. Basin Big Sagebrush Shrub-steppe is an ODFW conservation strategy habitat (ODFW 2006).

Other habitat types and subtypes are deemed Category 2 solely by their lying within deer winter range or by their lying adjacent to habitat identified as Category 1 on the basis of use by Washington ground squirrels. These include one additional habitat subtype within the Shrub-steppe type (Rabbitbrush/ Snakeweed Shrub-steppe), and two additional habitat types—Grassland and Developed—that include three additional habitat subtypes (Exotic Annual Grassland, Native Perennial Grassland, and Developed–Revegetated or Other Planted Grassland). For each of these Category 2 habitats, the vegetative structure, ecological condition, and usefulness to wildlife generally and to Sensitive Species in particular are similar to that described for the respective Category 3 and Category 4 types and subtypes described below (and so are not described separately here). The only thing that differentiates between these Category 2 habitats and their respective Category 3 or Category 4 habitats is a perceived importance to deer by virtue of the ODFW delineation of deer winter range (ODFW 2013) or their potential use by dispersing Washington ground squirrels. Actual use by and importance to deer of these habitat subtypes is variable, with Revegetated or Other Planted Grasslands and Native Perennial Grasslands being used

by wintering big game to a much greater extent than Rabbitbrush/Snakeweed Shrub-steppe and Exotic Annual Grasslands.

Category 3 Habitat

Three types of habitats were identified as Category 3 within the Project boundary: Developed, Grassland, and Shrub-steppe. Category 3 Shrub-steppe includes two subtypes, Basin Big Sagebrush Shrub-steppe and Rabbitbrush/Snakeweed Shrub-steppe.

Developed

Category 3 Developed habitats are areas where former disturbances have ceased and the disturbed areas have attained sufficient ecological condition to become important or essential for wildlife. Revegetated or Other Planted Grassland is the only developed Category 3 subtype within wildlife survey areas associated with the Project.

Category 3 Revegetated or Other Planted Grasslands are planted grasslands on previously farmed or other disturbed lands that may be enrolled in the Conservation Reserve Program. This habitat subtype is comprised mainly of native or native-like grasses. Native vegetation in Category 3 Revegetated or Other Planted Grasslands may be sparse and not well-developed, and may have a significant component of annual grasses and weeds. This habitat supports state Sensitive species such as grasshopper sparrow and white-tailed jackrabbit. During the years of wildlife surveys at Wheatridge, montane vole was present at extremely high densities; this resulted in concentrations of breeding raptors (northern harrier and short-eared owl) and wintering raptors (northern harrier, red-tailed hawk, rough-legged hawk, short-eared owl, and golden eagle).

Grassland

Category 3 Grasslands provide essential or important foraging and nesting habitat for special status birds and mammals as well as for common native and non-native avian species. There was a single Category 3 grassland habitat subtype, Native Perennial Grassland, found within Wheatridge wildlife survey areas.

Category 3 Native Perennial Grasslands are dominated by native perennial grasses such as Sandberg bluegrass, bluebunch wheatgrass, Idaho fescue, western needlegrass, and needle-and-thread grass. Various native forbs and low shrubs such as gray rabbitbrush and, to a lesser extent, green rabbitbrush are present but are an inconspicuous component. Native vascular plants are diverse and a variety of invertebrates can be found utilizing the plants throughout the growing season. These habitats have been altered through land use or wildfires, and generally contain a significant component of non-native vegetation (broad-leaf weeds and annual grasses). Category 3 Native Perennial Grasslands generally occur on sites with shallow soils and harsh exposures, or in areas that have experienced livestock grazing or frequent fires. Category 3 Native Perennial Grassland is more abundant than Category 4 Native Perennial Grassland (described below). Native Perennial Grasslands provide essential foraging habitat to a variety of common resident and migratory birds and common mammals. State Sensitive

species that occur in this habitat include white-tailed jackrabbit, long-billed curlew, burrowing owl, and grasshopper sparrow. Native grasses and forbs provide forage for mule deer. Native Perennial Grassland is an ODFW conservation strategy habitat (ODFW 2006).

Shrub-steppe

The primary difference in the Category 2 and Category 3 Shrub-steppe habitats is the overall functionality of the habitat and the breeding season value for special status vertebrate wildlife species such as Washington ground squirrel and loggerhead shrike. In general, Category 3 tends to be more weedy, less biologically diverse, has obvious signs of prior or ongoing impacts, often including wildfire, and is a habitat type relatively common in the general area. The cryptogamic layer (the protective soil surface biotic crust of mosses, lichens, algae, and bacteria) has been impacted from land use, resulting in opportunities for non-native weedy plants to become established.

Category 3 shrub-steppe habitat is important to wildlife species but is not as limited in the region as Category 2 shrub-steppe. Two habitat subtypes are present in this category, Basin Big Sagebrush Shrub-steppe and Rabbitbrush/Snakeweed Shrub-steppe.

Category 3 Basin Big Sagebrush Shrub-steppe consists of basin big sagebrush at a mature stage (large structure). Patches of Category 3 Basin Big Sagebrush Shrub-steppe lack the density and plant health of Category 2 Basin Big Sagebrush Shrub-steppe or are in patches of limited size. The overstory sagebrush in this type is often decadent or lacks full foliage. Understory vegetation in Category 3 Basin Big Sagebrush Shrub-steppe often tends toward annual grasses and low weeds. These areas were historically higher quality habitats but are experiencing degradation due to land use practices or frequent fires. However, the mature shrub cover provides escape and resting cover for common wildlife and is limited in the immediate area and the region. Basin Big Sagebrush Shrub-steppe offers high quality breeding habitat for shrub obligate species including loggerhead shrike, and may support Washington ground squirrel and white-tailed jackrabbit. Sagebrush lizard may be found in areas where more sandy soils are present. Basin Big Sagebrush Shrub-steppe is an ODFW conservation strategy habitat (ODFW 2006).

Category 3 Rabbitbrush/Snakeweed Shrub-steppe is by far the most abundant Shrub-steppe subtype within wildlife survey areas associated with Wheatridge. Category 3 Rabbitbrush/Snakeweed Shrub-steppe areas have been affected by recent fires and are in a relatively early seral stage. Native rabbitbrush and other low-stature plants such as broom snakeweed and various buckwheat species are common. The understory is native Sandberg bluegrass, non-native cheatgrass, bulbous bluegrass, and tumblemustard. Patches of native perennial grasses, such as bluebunch wheatgrass and needle-and-thread grass, are present. Many of these sites contain small patches of sagebrush that are less than one acre (0.4 ha) in size. Category 3 Rabbitbrush/Snakeweed Shrub-steppe provides foraging, cover, and/or nesting habitat for white-tailed jackrabbit and grasshopper sparrow.

Category 4 Habitat

There are three subtypes of Category 4 habitat within wildlife survey areas associated with the Wheatridge Project; these are Exotic Annual Grassland, Native Perennial Grassland, and Rabbitbrush/Snakeweed Shrub-steppe.

Grassland

There are two subtypes of Category 4 grassland in the wildlife survey areas associated with the Project; these are Exotic Annual Grassland and Native Perennial Grassland.

Category 4 Exotic Annual Grassland found within the wildlife survey areas associated with the Project are non-native grasslands with a very high weed component and disturbed or less nutrient-rich soils. The forb component is composed primarily of non-native weeds, such as cheatgrass, bulbous bluegrass, cereal rye, tumblemustard, and Russian thistle, with occasional patches of native bunchgrass, primarily Sandberg bluegrass. The high weed content is primarily due to past fires, which burned native shrubs and bunchgrasses and were followed by heavy grazing and/or wind erosion. Some of these sites support long-billed curlew. Category 4 Exotic Annual Grassland provides important habitat to common species like horned lark, but the dense weed cover and lack of native grasses limit the ability of most wildlife species to use these areas for forage or cover. In addition, the weed cover, often dominated by annuals such as cheatgrass, makes the slopes in this area more susceptible to erosion and soil damage from grazing, because of a lack of the robust root structure found in perennial species, such as the native bunchgrasses. With sufficient time and appropriate livestock grazing practices, however, these areas could become suitable habitat for some native wildlife species. This habitat is commonly found throughout the Columbia Basin.

Category 4 Native Perennial Grassland occurs in small patches within the wildlife survey areas associated with the Project. Category 4 Native Perennial Grassland is ecologically similar to Category 3 Native Perennial Grassland but is classified as Category 4 because its small size and isolated nature limit its value to wildlife. Native Perennial Grasslands provide important foraging habitat to a variety of common resident and migratory birds and common mammals. White-tailed jackrabbit, burrowing owl, and grasshopper sparrow use this habitat. Native grasses and forbs provide forage for mule deer. Native Perennial Grassland is an ODFW conservation strategy habitat (ODFW 2006).

Shrub-steppe

There is one subtype of Category 4 Shrub-steppe—Rabbitbrush/Snakeweed Shrub-steppe—within the wildlife survey areas associated with the Project.

Category 4 Rabbitbrush/Snakeweed Shrub-steppe habitat is important to wildlife. Category 4 Rabbitbrush/Snakeweed Shrub-steppe has the same plant species, but differs in composition from Category 3 Rabbitbrush/Snakeweed Shrub-steppe. Category 4 Rabbitbrush/Snakeweed Shrub-steppe has a greater weed and annual grass component than Category 3

Rabbitbrush/Snakeweed Shrub-steppe. While aspect and soils may contribute somewhat to this, disturbances such as livestock grazing and fires likely have a far greater effect. Category 4 Rabbitbrush/ Snakeweed Shrub-steppe provides foraging and/or nesting habitat for white-tailed jackrabbit.

Category 6 Habitat

Category 6 habitat is nonessential wildlife habitat with limited potential to become important or essential in the foreseeable future. There is one type of Category 6 habitat—Developed—within the wildlife survey areas associated with the Project.

Developed

There are three subtypes of Developed habitat within the wildlife survey areas associated with the Project; these are Irrigated Agriculture, Dryland Wheat, and Other.

Category 6 Irrigated Agriculture habitat consists of agricultural crop or pasture fields that are irrigated for all or a portion of the growing season. These areas were recognized by presence of irrigated farm crops and on-site irrigation implements such as pipes, sprinklers, pumps, and motors.

Category 6 Dryland Wheat habitat is the largest habitat subtype within the wildlife survey areas associated with the Project and is extensive throughout the region. It consists of agricultural fields that are currently in small grain production or fallow. Swainson's hawks occasionally hunt for prey in wheat stubble fields.

Category 6 Other habitat includes farming/ranching home and shop sites, corrals, structures, feedlots, active and inactive gravel quarries, non-irrigated pastures, graveled and paved roads, right-of-ways, and waste areas associated with on-going human activities. Although some areas have deciduous tree landscaping that attracts some native and non-native passerines, these Other Developed areas are not considered to have significant value to wildlife species. Because of the high level of disturbance, no special status/sensitive species are known or expected to occur with regularity in the Category 6 habitats, and these areas have low potential to become essential or important wildlife habitat in the foreseeable future.

3.2 Oregon Conservation Strategy Habitats

Two of the habitat subtypes found at Wheatridge are ODFW Conservation Strategy Habitats (ODFW 2006). These are Native Perennial Grassland and Basin Big Sagebrush Shrub-steppe.

4.0 Occurrence of State Sensitive Species – OAR 345-021-0010(1)(p)(D) and (E)

4.1 Results of Information Review

Records of rare, Threatened, and Endangered plant and wildlife species were requested from ORBIC in early 2011 and received by NWC on March 18, 2011. USFWS lists of Endangered, Threatened, Proposed, and Candidate species, and Species of Concern for Morrow and Umatilla Counties were accessed in March 2011 and again in December 2012. Based on these, on information from ODFW district biologists and regional birders and birding groups, and on NWC's familiarity with the wildlife and habitats of the Project area and surrounding region, a list was compiled of those state sensitive species with the possibility of occurrence on the Project. These included one terrestrial mammal species, eight bat species, 13 bird species, one lizard, one turtle, three fish species, and no plants. (See Appendices C, D, and E of Attachment P-1 for complete lists of species; listed and candidate species are addressed in Exhibit Q.)

ORBIC results did not include any records of bat species within 5 miles of the Project area. They included records of one mammal species (white-tailed jackrabbit), six bird species (ferruginous hawk, Swainson's hawk, burrowing owl, long-billed curlew, grasshopper sparrow, and black-throated sparrow), one turtle (painted turtle), and one fish species (Steelhead; Middle Columbia River summer run).

ORBIC results included one bald eagle nest within 10 miles of the Project, and NWC was familiar with at least three golden eagle breeding territories within 10 miles prior to the initiation of field surveys.

4.2 Results of Field Surveys

4.2.1 Avian Use Survey

Full results of the avian use study (including all birds detected, not just those with special status) are shown in Attachment P-1, where they are broken down by turbine group (Wheatridge East and Wheatridge West). There were eight sensitive bird species detected, and both bald and golden eagle (species of concern that are not state Sensitive) were also detected (Table P-2). Sensitive species detected were Swainson's hawk (Sensitive-Vulnerable), ferruginous hawk (Sensitive-Critical), peregrine falcon (Sensitive-Vulnerable), greater Sandhill crane (Sensitive-Vulnerable), long-billed curlew (Sensitive-Vulnerable), burrowing owl (Sensitive-Critical), loggerhead shrike (Sensitive-Vulnerable), and grasshopper sparrow (Sensitive-Vulnerable). Each of these was detected at avian use surveys associated with both turbine groups except bald eagle and burrowing owl (which were detected only at plots associated with Wheatridge West turbine group) and peregrine falcon (Wheatridge East turbine group only).

A single burrowing owl was detected on one occasion (during fall), individual peregrine falcons were detected on three occasions (twice in winter, once in summer), and individual bald eagles

were detected on four occasions (all in winter). Loggerhead shrike detections occurred during all seasons, but numbered only eight in total. Greater Sandhill cranes were detected eight times, and varied from as few as five individuals to a flock of 113 individuals.

For others of these species, detections were more frequent, and mean use was higher. For some of these, detections were nonetheless somewhat seasonal. Long-billed curlew detections were limited to spring and summer seasons, during which mean use was 1.407 and 0.341 at Wheatridge West plots and 0.256 and 0.052 at Wheatridge East plots, respectively. After the breeding season, long-billed curlews migrate away from their inland breeding sites to spend most of the year in other (primarily coastal) areas.

Grasshopper sparrow was likewise detected only during spring and summer seasons; mean use during these seasons was 0.097 and 0.104 at Wheatridge West plots and 0.384 and 0.477 at Wheatridge East plots, respectively. This species winters far south of the Columbia Plateau.

Swainson's hawk—which migrates to South America for the winter—was detected during spring, summer, and fall seasons (with the highest mean use being in summer; 0.659 at Wheatridge West plots and 0.182 at Wheatridge East plots).

Ferruginous hawk was detected during all seasons (at both sets of avian use plots), but most observations were during spring and summer seasons, when this species is breeding in the Columbia Plateau. Highest mean use values were for spring and summer at Wheatridge West plots (0.074 and 0.058, respectively) and spring at Wheatridge East plots (0.093).

Golden eagle was detected during all survey seasons at Wheatridge West plots, but the majority of detections were in winter and fall (13 and 12, respectively), with two and three detections during spring and summer, respectively. All detections were of single individuals. At Wheatridge East plots, 17 of the 18 detections occurred in winter (the remaining one was during spring); most of these were of individuals, but two birds were detected together on five occasions. Highest mean use was during winter at Wheatridge East plots (0.118) and during fall and winter at Wheatridge West plots (0.074 and 0.038, respectively).

The year of avian use surveys was one of extremely high population densities of montane vole throughout the Project area and the Columbia Plateau. This led to higher-than-average raptor densities through both winters of survey and the intervening breeding season. Use of the Project area by raptors during the avian use study is expected to be quite high relative to what can be expected during most years.

Table P-2: Eagles and Avian Sensitive species and Species of Concern within Avian Use Plots

Species	Winter (443 surveys)		Spring (262 surveys)		Summer (261 surveys)		Fall (263 surveys)		Total	
	# Grp	# Ind	# Grp	# Ind	# Grp	# Ind	# Grp	# Ind	# Grp	# Ind
Bald eagle	4	4	0	0	0	0	0	0	4	4
Golden eagle	28	28	3	3	3	3	13	13	47	47
Swainson's hawk	0	0	75	81	113	130	39	45	227	256
Ferruginous hawk	5	5	17	21	13	13	7	7	42	46

Table P-2: Eagles and Avian Sensitive species and Species of Concern within Avian Use Plots										
Species	**Winter** (443 surveys)		**Spring** (262 surveys)		**Summer** (261 surveys)		**Fall** (263 surveys)		**Total**	
	# Grp	**# Ind**	**# Grp**	**# Ind**	**# Grp**	**# Ind**	**# Grp**	**# Ind**	**# Grp**	**# Ind**
Burrowing owl	0	0	0	0	0	0	1	1	1	1
Peregrine falcon	2	2	0	0	1	1	0	0	3	3
Greater Sandhill crane	1	5	4	130	0	0	3	204	8	339
Long-billed curlew	0	0	82	166	23	39	0	0	108	205
Loggerhead shrike	2	2	3	4	1	1	2	2	8	9
Grasshopper sparrow	0	0	39	50	42	60	0	0	81	110

Complete results of avian use studies, including all species and other analyses (mean use, frequency of occurrence, and percent composition), can be found in Attachment P-1.

4.2.2 Raptor Nest Survey

The aerial raptor nest survey of the Wheatridge Wind Energy Project covered an area of approximately 237.5 square miles (Figure P-3). In all, 41 active raptor nests (and 16 common raven nests) were found during this survey, including nests of the following species:

- Swainson's hawk – 26
- Ferruginous hawk – 4
- Red-tailed hawk – 7
- Prairie falcon – 1
- Great horned owl – 2
- Barn owl – 1

Among these, the state Sensitive species were Swainson's hawk (Sensitive-Vulnerable) and ferruginous hawk (Sensitive-Critical).

In addition, 74 inactive stick nests were located. Of these, one was built by golden eagles, and 44 others were large and likely built by ferruginous hawks.

Overall raptor nest density within the 237.5-mi^2 survey area was 0.17 nests per square mile (Swainson's hawk 0.11/mi^2, ferruginous hawk 0.02/mi^2). In general, nests of northern harrier, burrowing owl, short-eared owl, and American kestrel are difficult to find using the aerial survey method. For comparison with other sites, nest density of those species (northern harrier, burrowing owl, and short-eared owl) found during special status wildlife species surveys are not included in the total nest density. This nest density estimate also does not include common raven nests or inactive nests.

Raptor nest survey results are broken down by Project component (Wheatridge West turbine group, Wheatridge East turbine group, and transmission Intraconnect Corridor) in Section 4.5 of Attachment P-1 (Gerhardt and Anderson, 2014); locations of all nests detected, active and inactive, were mapped, and those maps have been shared with USFWS and ODFW personnel. Nest densities by Project component are compared with those at other Columbia Plateau wind energy developments in Table 5 of Attachment P-1.

4.2.3 Eagle Nest Survey

The 2011 eagle nest survey of the Project area and an area within ten miles of the Project boundary yielded one unoccupied and seven occupied golden eagle territories, five active nests, four successful breeding attempts, and seven fledged young. Nests at occupied territories were at distances from the nearest proposed turbines of 6.4 km (4.0 mi), 7.5 km (4.7 mi), 11.3 km (7.0 mi), 13.0 km (8.1 mi), 16.6 km (10.3 mi), 17.4 km (10.6 mi), and 17.6 km (10.9 mi). The single historical bald eagle nest located in Umatilla County in the ORBIC records was found to be no longer present.

Results of this eagle nest survey were shared with the Oregon Eagle Foundation, the USFWS, and ODFW. Territories are described in more detail in Attachment P-1 (Gerhardt and Anderson 2014) and mapped in Figure 8 of that attachment (submitted separately to the agencies because of the sensitive nature of these locations).

4.2.4 Golden Eagle Nest Monitoring

The 2012 eagle nest monitoring of the Project area and an area within 10 miles of the Project boundary yielded six occupied golden eagle territories, four active nests, two successful breeding attempts, and three fledged young. The 2013 eagle nest monitoring yielded four occupied golden eagle territories, two active nests, one successful breeding attempt, and one fledged young. The 2014 eagle nest monitoring yielded five occupied golden eagle territories, three active nests, three successful breeding attempts, and three fledged young.

4.2.5 Special Status Vertebrate Wildlife Species Survey

Two mammalian species with special status and their sign were detected during special status vertebrate wildlife species surveys; these were Washington ground squirrel and white-tailed jackrabbit. Washington ground squirrel is a state Threatened species, and is addressed in Exhibit Q; white-tailed jackrabbit is a state Sensitive-Vulnerable species. Four state Sensitive avian species were detected during these surveys; these were burrowing owl, long-billed curlew, loggerhead shrike, and grasshopper sparrow.

White-tailed jackrabbit: Nine detections of one or two white-tailed jackrabbits were recorded; in addition, jackrabbit pellets were recorded at 24 locations (Figures 11a, 11b, and 11c of Attachment P-1). Detections of this species occurred in Native Perennial Grassland, Revegetated Grassland, Exotic Annual Grassland, Rabbitbrush/Snakeweed Shrub-steppe, and Basin Big Sagebrush Shrub-steppe habitats.

Burrowing Owl (State Sensitive-Critical): There were four detections of dens with burrowing owl activity during the period in which this species breeds. One of these was associated with the Wheatridge West turbine group, two were associated with the Wheatridge East turbine group, and one was associated with the transmission Intraconnection Corridor (Figures 11a, 11b, and 11c of Attachment P-1).

Long-billed curlew (State Sensitive-Vulnerable): There were 34 detections of long-billed curlew (Figures 11a, 11b, and 11c of Attachment P-1); these were of pairs or of individuals exhibiting territorial behaviors. Detections occurred in five habitat types, Revegetated Grassland, Exotic Annual Grassland, Native Perennial Grassland, Basin Big Sagebrush Shrub-steppe, and Rabbitbrush/ Snakeweed Shrub-steppe. Most detections of this species were in relatively gentle terrain.

Loggerhead shrike (State Sensitive-Vulnerable): There were five detections of loggerhead shrike, all of them associated with surveys of the Wheatridge West turbine group (Figure 11a of Attachment P-1). Although this species is normally associated with Basin Big Sagebrush Shrub-steppe, these detections occurred instead in Rabbitbrush/Snakeweed Shrub-steppe, Native Perennial Grassland, and Exotic Annual Grassland.

Grasshopper sparrow (State Sensitive-Vulnerable): Detections of grasshopper sparrow numbered 615, and occurred throughout the Project survey corridors (Figures 11a, 11b, and 11c of Attachment P-1). Most detections were of singing territorial males, but some were of likely females, of pairs together, or of nests. Grasshopper sparrows were detected most numerously in Native Perennial Grassland, Revegetated Grassland, and Exotic Annual Grassland, but detections also occurred in Basin Big Sagebrush Shrub-steppe and Rabbitbrush/Snakeweed Shrub-steppe. Though designated a State Sensitive-Vulnerable species due to conversion of native grassland habitat to agriculture and other development, grasshopper sparrow is one of the most numerous avian species on the Project and within the Columbia Plateau during the seasons it is present.

4.2.6 Bat Species Investigation

Eight species of bat were detected at one or more of the 12 acoustic monitoring sites (Table P-3). These included the two special status species known to be at risk of collision with turbines, hoary bat (state sensitive-vulnerable) and silver-haired bat (state sensitive-vulnerable, federal species of concern). Other detected special status species were California myotis (state sensitive-vulnerable), small-footed myotis (federal species of concern), long-eared myotis (federal species of concern), and long-legged myotis (state sensitive-vulnerable, federal species of concern).

Silver-haired bat was detected at 11 of the 12 study locations and at each of the three Project components. Small-footed myotis was detected at nine of the 12 acoustic monitoring sites and at each of the three components of the Project. Hoary bat was found at six of the detector locations and at each of the three Project components. California myotis, long-eared myotis, and long-legged myotis were each detected at a single site (7B), near a riparian area along the Intraconnection Corridor (Tables P-1 and P-3, Figure P-5).

Table P-3: Bat Species Detected by Survey Station

Common Name	Species	Acoustic Monitoring Site											
		1A	1B	2A	2B	3A	3B	4A	4B	5A	5B	7A	7B
Hoary bat*	*Lasiurus cinereus*	X			X	X	X			X			X
Silver-haired bat*	*Lasionycteris noctivagans*	X	X	X	X	X	X	X	X	X		X	X

California myotis*	*Myotis californicus*												X
Small-footed myotis*	*Myotis ciliolabrum*	X	X		X	X	X			X	X	X	X
Long-eared myotis*	*Myotis evotis*												X
Little brown bat	*Myotis lucifugus*					X				X		X	X
Long-legged myotis*	*Myotis volans*												X
Canyon bat	*Parastrellus hesperus*						X			X		X	X

* Denotes a species of special status (state Sensitive species and/or federal Species of Concern).

4.2.7 Special Status Plant Survey

A single special status vascular plant species—Laurent's milkvetch (*Astragalus collinus* var. *laurentii*)—was found during special status plant surveys; as a state Threatened species, it is addressed in Exhibit Q, as are several other state Candidate species (that were not found). No state Sensitive species and no (non-listed, non-Candidate) federal Species of Concern were detected.

5.0 Description of Potential Adverse Impacts – OAR 345-021-0010(1)(p)(F)

5.1 Potential Impacts to Wildlife Habitat

Impacts to wildlife habitat include both temporary and permanent habitat loss. Habitat loss and various levels of habitat alteration and disturbance occur mainly during construction. Periodically during operations, additional temporary impacts may occur for facility repairs or upgrades. These will be restored as required in the Permit Conditions. Permanent impacts are those where Project facilities are located for the life of the Project or where complete restoration of temporarily impacted habitats may not be attainable. Mature sagebrush shrubs in Shrub-steppe habitat may not be restored to the pre-construction structural stage for an extensive time-period (20–30 years or more). Table P-4 identifies habitat impacts by type and category for each of the three Project components and for two alternate layouts and two lengths of intraconnection lines.

In some cases, habitat loss can lead to habitat fragmentation, a situation in which remaining suitable habitat has been made inaccessible to wildlife, as development presents an impassable barrier between suitable patches. Habitat fragmentation is not as great a concern in grassland and shrub-steppe habitats as in forested landscapes, and wind turbines and associated roads and facilities are not deemed to constitute an impassable barrier to wildlife species in general or to state Sensitive species in particular. There are no special status species associated with the Wheatridge Project for which habitat fragmentation is deemed a concern (Section 5.1 of Attachment P-1).

Table P-4: Impacts by Habitat Category and Type

Wheatridge West Turbine Group				
Category and Habitat Description	**Impacts (acres)**			
	Maximum Layout		**Minimum Layout**	
	Temporary	**Permanent**	**Temporary**	**Permanent**
Category 2				
Developed – Revegetated/Other Planted Grassland	106.9	17.0	100.8	14.4
Grassland – Exotic Annual	13.3	1.7	7.8	0.8
Grassland – Native Perennial	32.3	5.5	34.9	4.7
Shrub-steppe – Basin Big Sagebrush	2.5	0.8	2.4	0.8
Total	**155.5**	**24.9**	**146.4**	**20.7**
Category 3				
Developed – Revegetated/Other Planted Grassland	60.7	8.0	66.5	7.7
Grassland – Native Perennial	28.7	5.5	25.8	4.6
Shrub-steppe – Rabbitbrush/Snakeweed	2.1	0.0	1.5	0.0
Total	**91.5**	**13.5**	**93.9**	**12.3**
Category 4				
Grassland – Exotic Annual	11.6	1.8	11.3	1.7
Total	**11.6**	**1.8**	**11.3**	**1.7**
Subtotal for Cat. 2, 3, 4	**258.6**	**40.3**	**251.6**	**34.7**
Category 6				
Developed – Dryland Wheat	533.3	88.3	481.9	73.6
Developed – Other	1.0	0.3	0.9	0.3
Total	**534.3**	**88.6**	**482.8**	**73.8**
Total for all Categories	**792.9**	**128.9**	**734.4**	**108.5**

Wheatridge East Turbine Group				
Category and Habitat Description	**Impacts (acres)**			
	Maximum Layout		**Minimum Layout**	
	Temporary	**Permanent**	**Temporary**	**Permanent**
Category 2				
Grassland – Exotic Annual	17.2	3.3	17.7	3.2
Grassland – Native Perennial	19.5	2.6	20.2	2.5
Total	**36.7**	**6.0**	**37.9**	**5.7**
Category 3				
Grassland – Native Perennial	14.4	1.9	14.3	1.8
Shrub-steppe – Rabbitbrush/Snakeweed	12.1	1.9	12.7	1.6
Total	**26.4**	**3.8**	**27.0**	**3.4**
Category 4				
Grassland – Exotic Annual	7.8	1.3	6.6	1.0
Grassland – Native Perennial	1.2	0.2	1.5	0.3
Shrub-steppe – Rabbitbrush/Snakeweed	2.7	0.3	1.4	0.3
Total	**11.7**	**1.8**	**9.4**	**1.6**
Subtotal for Cat. 2, 3, 4	**74.8**	**11.6**	**74.3**	**10.7**
Category 6				

Developed – Dryland Wheat	185.7	29.9	190.9	27.7
Total	**185.7**	**29.9**	**190.9**	**27.7**
Total for all Categories	**260.5**	**41.5**	**265.2**	**38.4**
Intraconnection Corridor				
Category and Habitat Description	**Impacts (acres)**			
	Longer Option		**Shorter Option**	
	Temporary	**Permanent**	**Temporary**	**Permanent**
Category 2				
Developed – Revegetated/Other Planted Grassland	11.5	0.1	11.5	0.1
Grassland – Exotic Annual	3.0	0.0	3.0	0.0
Grassland – Native Perennial	36.8	0.2	36.8	0.2
Shrub-steppe – Basin Big Sagebrush	0.7	0.0	0.7	0.0
Shrub-steppe – Rabbitbrush/Snakeweed	14.7	0.1	14.2	0.1
Total	**66.7**	**0.4**	**66.2**	**0.4**
Category 3				
Developed – Revegetated/Other Planted Grassland	7.2	0.1	3.2	0.0
Grassland – Native Perennial	6.7	0.0	6.7	0.1
Shrub-steppe – Basin Big Sagebrush	0.4	0.0	0.0	0.0
Shrub-steppe – Rabbitbrush/Snakeweed	2.5	0.0	1.0	0.0
Total	**16.8**	**0.1**	**10.9**	**0.1**
Category 4				
Grassland – Exotic Annual	2.5	0.0	1.9	0.0
Total	**2.5**	**0.0**	**1.9**	**0.0**
Subtotal for Cat. 2, 3, 4	**86.0**	**0.5**	**79.0**	**0.5**
Category 6				
Developed – Dryland Wheat	56.3	0.4	33.4	0.3
Developed – Irrigated Agriculture	1.0	0.0	1.0	0.0
Developed – Other	0.6	0.0	0.3	0.0
Total	**58.0**	**0.4**	**34.7**	**0.2**
Total for all Categories	**144.0**	**0.9**	**113.7**	**0.7**

Temporary facilities include access roads, construction areas, access for overhead line construction, installation sites for underground collector cables, and equipment laydown areas for individual turbines, entire strings of turbines, and laydown areas for in-transit towers, cranes, and miscellaneous construction equipment.

Permanent facilities include turbine pads and towers, substation, meteorological towers, Operations and Maintenance facility or facilities, and permanent access roads.

5.2 Potential Impacts to State Sensitive Species

5.2.1 Construction and Operation

In general, potential construction-related impacts include permanent and temporary loss of habitat, direct fatalities due to construction equipment and vehicles, loss of nesting structures, and disturbance during critical life stages (e.g., breeding season for birds and mammals and wintering for mule deer). Most of these potential impacts have been or will be avoided or minimized through micrositing, timing of construction, and other conditions described below (Section 6.1)

The primary potential impact of the operation of the Project is expected to be direct fatality of birds and bats through collision with rotating turbine blades. Secondary potential impacts from the operation of the Project include collision with vehicles on Project roads and displacement from otherwise suitable habitat.

5.2.1.1 Amphibians and Reptiles

No state Sensitive amphibians or reptiles were documented on the Project, and little or no potentially suitable habitat (for sagebrush lizard) is expected to be impacted by construction and operation of the Project.

5.2.1.2 Birds

State Sensitive avian species for which direct fatality from collision with turbines is a potential concern are Swainson's hawk, ferruginous hawk, and golden eagle. Other Sensitive avian species documented on the Project—greater Sandhill crane, long-billed curlew, burrowing owl, loggerhead shrike, and grasshopper sparrow—are rarely or never found as fatalities at Columbia Plateau wind projects (Table 11 of Attachment P-1).

Swainson's hawk: Swainson's hawk (a Sensitive-Vulnerable species) was broadly distributed and quite common during spring and summer at Wheatridge. There were 26 active nests located within the aerial raptor nest survey area (Sec. *4.2.2*), and nests were built in a variety of tree species, including small and dead trees normally considered poor raptor nest sites. Swainson's hawk appears to be susceptible to collision with turbines, and comprises 0.7% of the fatalities recorded during scheduled searches at wind projects in the Columbia Plateau Ecoregion for which fatality monitoring studies have been completed (Table 11 of Attachment P-1). The past several years have seen an increase in fatalities of this species at CPE wind farms; though other factors may also be at play, this increase coincides with observed region-wide increases in overall numbers of Swainson's hawks and their nests.

Siting turbines to avoid risk to Swainson's hawk is made difficult by a number of factors. Nests of this species are more ephemeral than those of other raptors, and Swainson's hawks place their nests in a wider variety of trees, shrubs, and other substrates than other hawks, making predicting locations of future nests problematic. Despite its current status, Swainson's hawk is numerous and increasing locally and regionally; if this trend continues, it will likely mean more nests in proximity to turbines and more potential for interaction with rotors. Finally, although the majority of proposed turbine placements are in Dryland Wheat, Swainson's hawks are more likely to hunt in these developed habitat types than are most other raptor species.

For all of these reasons—and despite efforts to avoid known nests—operation of the Project poses a moderate to high risk to individual Swainson's hawks or pairs. The risk to populations is expected to be low, however, since an increase in the occurrence of fatalities would likely reflect and follow an increase in overall population numbers. The primary reason for concern for this species was the discovery in the 1990's of high death rates associated with pesticide use on the wintering grounds (Woodbridge et al. 1995). This source of fatality has since been reduced, and Swainson's hawk

breeding populations appear to be doing well and increasing, including at Wheatridge where their nests far outnumbered even those of red-tailed hawks.

The construction of facilities may pose a risk to active breeding attempts if construction occurs during the Swainson's hawk breeding season.

Ferruginous hawk: Breeding territories of ferruginous hawk (a Sensitive-Critical species) were broadly distributed across the aerial raptor nest survey area for Wheatridge. This species was detected during avian use surveys in all seasons, with the majority of observations occurring in spring and summer. Most suitable breeding and foraging habitat exists outside the areas where facilities are proposed.

Ferruginous hawk comprises 0.2% of the fatalities and 2.4% of the raptor fatalities recorded during scheduled searches at Columbia Plateau Ecoregion wind projects for which fatality monitoring studies have been completed and made public (Table 11 of Attachment P-1). These relatively low numbers are likely reflective of the species' low density in the region and not indicative of a difference (relative to other Buteos) in the susceptibility of individuals to collision. In a recent telemetry study of nests and young within the Columbia Plateau of Oregon, daily survival rate of ferruginous hawk nests decreased as number of turbines within 3.1 km (1.9 mi) increased; while no young in the study died by collision with turbines, juvenile ferruginous hawks from nests closer to the nearest turbine were more likely to die of predation or starvation prior to dispersing from the natal area than young from nests farther from the nearest turbine (Kolar 2013). NWC has used satellite telemetry to assess survival and movements of young of this species from Morrow and Gilliam Counties; of six young telemetered, three apparently starved during the post-fledging period, one died within a week of dispersing from the natal area (NWC, unpublished data), one broke its wing (and was subsequently euthanized) on its wintering grounds in NE Arizona (Gerhardt and Anderson 2013a), and one was killed by a car on its wintering grounds in southeast California (Gerhardt and Anderson 2013b).

Bald eagle: There were four detections of bald eagle (neither a Sensitive species nor a Species of Concern) during avian use surveys. Each was at a plot associated with the Wheatridge West turbine group, and all were during the winter survey season (Table P-2). The nearest known historical nest was from nearly 10 miles away, and was no longer present 2011–2014. However, a new active nest was discovered during the 2014 breeding season approximately 7.5 miles from Wheatridge West (PGE 2014). No suitable nesting habitat exists on the Project, and use of the area is expected to be limited to winter, when the species sometimes feeds on carrion in upland situations. This species successfully avoids turbines (Sharp et al., 2010), and only six have been documented as fatalities at wind farms in the contiguous United States (Pagel et al. 2013). Construction and operation of Wheatridge is not expected to entail a significant risk to bald eagles.

Golden eagle: Use of the Project by golden eagle (neither a Sensitive species nor a Species of Concern) was primarily in winter and fall and confined to native habitats on the outer edges of the survey area. No suitable nesting habitat exists on the Project, and facilities were sited as far from nests as possible (the nearest turbine-to-nest distance is 3.85 miles and involves a nest and territory that had no active breeding attempts during the four years of monitoring). Since both the

adult male and a young male from the nearest active nest were followed by telemetry during the year in which avian use surveys were conducted (and subsequent years), it is possible to assert with confidence that most or all detections of golden eagles on the Project were of birds not resident at a nearby territory.

The winter use of Wheatridge was likely much greater during the year of survey than in most years. The types of prey that typically attract wintering eagles in this region were at best uncommon on the Project. Small numbers of mule deer were present, and jackrabbits, chukar, and pheasant were infrequently encountered; cattle did not calve within the survey area. Voles—a prey species too small to constitute an important part of the diet of a golden eagle—were present at extremely high densities during the fall and winter of avian use study. This resulted in higher than normal numbers of raptor species that do prey extensively on voles, including northern harrier, red-tailed hawk, rough-legged hawk, long-eared owl, and short-eared owl; even snowy owl (an extremely rare winter visitor to this region) was observed with regularity in areas around Wheatridge during the winter of survey. It is likely that the golden eagles observed using the Project that fall and winter were attracted by the high numbers of other raptors, many of which themselves serve as eagle prey.

This is particularly true for resident territorial eagles. All proposed turbines were sited more than 3.85 miles from the nearest identified eagle nest, and telemetry showed that the home range of the adult male and the natal home range of a young male from the nearest active nest did not include the areas in which Project facilities are planned (report and maps submitted to Wheatridge and to ODFW and USFWS personnel).

Proposed Project facilities were sited as much as possible in developed habitat (Dryland Wheat), where neither golden eagles nor their prey are expected to spend much time. Although eagles occasionally fly through such habitat, they are not expected to be susceptible to collision with turbines at those times, since their attention is not likely to be diverted by prey or other eagles. Golden eagles spend the majority of their time in canyons (as observed and also documented through telemetry), whereas proposed turbines are sited primarily on ridge tops. Telemetry of the adult male and of a young from the active nest nearest the Project allowed for confirmation that proposed facilities lie outside the home range of this pair (reports and maps submitted to ODFW and USFWS).

Golden eagle fatalities comprise just 0.1% of avian fatalities and 0.6% of raptor fatalities at CPE wind energy facilities (Table 11 of Attachment P-1). Research indicates that golden eagles are normally capable of detecting and avoiding turbines (Johnston et al. 2014). Whereas as many as six individuals of this species have been recorded as fatalities at wind energy facilities in Oregon (Pagel et al. 2013), these fatalities occurred at only two of the 40 facilities operating in the state, though nearly all such facilities document some level of use by golden eagles during preconstruction surveys. The sole Oregon wind energy facility where multiple golden eagle fatalities have been recorded (and assumed to be the result of interactions with turbines), the Elkhorn Valley Wind Farm, is anomalous—it is not part of the Columbia Plateau, and turbines were sited almost entirely in native habitats in an area of dense golden eagle nesting (WEST 2005). Preconstruction studies at Elkhorn documented far more detections and much higher golden eagle use than at other Oregon

sites (including Wheatridge), even though the Elkhorn studies were not conducted in winter, the season expected to have the highest use (as at Wheatridge). Indeed, golden eagle exposure indices at Elkhorn exceeded those of all but four bird species, American robin, tundra swan, European starling, and horned lark (WEST 2005).

Of 11 resident adult and nestling golden eagles telemetered by NWC in the CPE and tracked until their death, none collided with wind turbines; shooting, electrocution, and vehicular collision accounted for five, two, and one of the non-natural deaths, respectively (Gerhardt et al. 2013; unpublished NWC data). Despite these sources of ongoing mortality, this species appears to be stable or increasing over the past 42+ years in northern parts of the western United States and Canada, including in the Bird Conservation Region in which the Wheatridge Project lies (Millsap et al. 2013). The Project has a low likelihood of posing adverse impacts to golden eagle populations.

Peregrine falcon: There were three detections of peregrine falcon (a Sensitive-Vulnerable species) during avian use surveys associated with the Wheatridge East turbine group, two during winter and one during summer. The nearest known breeding territory for this species is in the Columbia Gorge in Gilliam County, and no suitable nest cliffs are found near Wheatridge. Use of the Project by this species is most likely during fall and winter, and is expected to consist of dispersing and migrant individuals. Risk is considered to be very low, both because of the low use of the area and because of the infrequency of collisions; a single individual has been documented as a fatality at wind projects in the CPE for which fatality monitoring studies have been completed (Table 11 of Attachment P-1).

Burrowing owl: Burrowing owl (a Sensitive-Critical species) was rare at Wheatridge. This species is not generally susceptible to collision with turbines; despite its documented presence at numerous Columbia Plateau wind energy developments, it has been recorded as a fatality only once. (This bird was determined by its band to be a migrant from British Columbia, rather than a local breeder.) As a highly auditory species, burrowing owl may be displaced from previously occupied breeding areas by the construction and operation of facilities at wind energy developments (for related research, see Barber et al. 2010). Nonetheless, burrowing owl is at low risk from the proposed Wheatridge Wind Energy Facility (based on low incidence of collision with turbines in the CPE and low use of the Project area). Potential adverse effects to burrowing owls are loss of suitable habitat, disturbance of active breeding attempts during construction, and possible displacement from suitable breeding and foraging habitat.

Greater Sandhill crane: No adverse effects to greater Sandhill crane (Sensitive-Vulnerable) are anticipated from construction and operation of the Project. Use of the area by this species was brief, and confined to the air space high above proposed facilities, as is typical of this species when migrating or making other long flights. The Project contains no habitat expected to attract individuals or flocks of this species. Though seasonal migrations take this species over much of the Columbia Plateau Ecoregion, there have been none detected as fatalities at CPE wind power projects (Table 11 of Attachment P-1). Construction and operation of Wheatridge is not expected to expose greater Sandhill crane to risk.

Long-billed curlew: Long-billed curlew (a Sensitive-Vulnerable species) is patchily distributed but relatively common at the Project. Despite its documented presence (during less than half of the year) at numerous Columbia Plateau wind energy developments, this species has been recorded as a fatality only twice (Table 11 of Attachment P-1), once during scheduled searches (Gritski and Kronner 2010b) and once incidentally (Gritski and Downes 2011) though preliminary analysis at the nearby Shepherd's Flat North wind project identified several fatalities there as being this species (Powell et al. 2013). Nor does displacement from suitable habitat seem to be a significant problem for this species; anecdotally, individuals and pairs have been found in close proximity to operating turbines (e.g., Gritski and Downes 2012; Downes et al. 2013). Long-billed curlew is deemed to be at low risk from the proposed Wheatridge West Wind Energy Facility. Construction and operation of facilities may, however, entail a loss of suitable breeding and foraging habitat for this species. Long-billed curlews are susceptible to human disturbance during the breeding season, which can result in nest abandonment or disruption of brood-rearing (Dugger and Dugger 2002); the construction of facilities may pose a risk to the success of active long-billed curlew breeding attempts if construction occurs in proximity to them during the breeding season.

Loggerhead shrike: Loggerhead shrike (a Sensitive-Vulnerable species) is narrowly distributed and relatively uncommon on the Project, confined primarily to Basin Big Sagebrush Shrub-steppe in the northern portion of the Wheatridge West turbine group. This species tends to fly low, is not considered susceptible to collision with turbines, and has not been recorded as a fatality at any wind energy development in the Columbia Plateau Ecoregion (Table 11 of Attachment P-1). The potential adverse effect to loggerhead shrike is habitat loss. As proposed, however, the Project's facilities layout involves the loss of a maximum of 2.5 acres of Basin Big Sagebrush Shrub-steppe, the habitat type with which this species is most closely associated. No significant adverse effects to loggerhead shrike are anticipated.

Grasshopper sparrow: Construction and operation of facilities may entail a loss of suitable breeding and foraging habitat for grasshopper sparrow (a Sensitive-Vulnerable species). In addition, studies have indicated that this species may be displaced from suitable breeding habitat by the construction and operation of wind energy facilities (NWC and WEST 2007; Johnson and Shaffer 2008). Grasshopper sparrow is widely distributed across the Project, is found in most habitat types, and is among the most abundant avian species during spring and early summer (Figure P-6). This species tends to fly low, and is not considered susceptible to collision with turbines; despite its abundance, only a single individual of this species has been recorded as a fatality at any wind energy developments in the Columbia Plateau Ecoregion (Table 11 of Attachment P-1). Present only four to five months of the year, grasshopper sparrow is at very low risk of direct impact from the proposed Wheatridge Wind Energy Facility. Because of this species' local and regional abundance and its ability to utilize a variety of habitat types, the small amount of loss of suitable habitat and potential for slight displacement associated with construction and operation of the Project are not expected to constitute a significant adverse effect to grasshopper sparrow.

5.2.1.3 Fish

No adverse impacts to state Sensitive fish or their habitats are expected from construction and operation of the Project.

5.2.1.4 Mammals

White-tailed jackrabbit: White-tailed jackrabbit (a Sensitive-Vulnerable species) is widely distributed and relatively common on the Project (Figure P-6) and uses a variety of the habitat types present. White-tailed jackrabbits are not likely to be at risk from construction or operation of the proposed wind energy development. This species does not seem to be displaced permanently by the construction of such facilities, as it is frequently observed near turbines and other facilities at operational wind farms. The speed limits that will be established for Project roads—and that will apply during construction and throughout Project operation—will be such as to minimize the possibility of vehicular collision. Construction and operation of facilities may entail a loss of suitable breeding and foraging habitat for this species.

Hoary bat: Currently available survey methods cannot be used for estimating bat abundance. Nonetheless, the detection of hoary bat (a Sensitive-Vulnerable species) at six of the 12 acoustic monitoring sites (Table P-2) suggests that this species is relatively common and flies through much of the Project during the late summer and fall months (its migration period). The Project does not provide suitable breeding habitat. This species flies rather high and may not use echo-location while migrating (Kunz et al. 2007; Cryan and Barclay 2009). The potential adverse effect to this species is collision with turbines, which is most likely during migration (August through October; Figure 13 of Attachment P-1) and at wind speeds up to approximately 5 s^{-1} (Horn et al. 2008). It comprises 50.2% of documented bat fatalities at Columbia Plateau wind energy facilities (Attachment P-1 Tables 12 and 13 and Figure 13). Individuals of this species are likely at moderate to high risk from the proposed Wheatridge Wind Energy Facility. The potential risk to populations and to the species as a whole is unknown; however, that risk is expected to be less at Wheatridge than at facilities sited nearer the species' preferred forest habitats and far less than at facilities in the eastern United States where fatalities tend to be ten times greater than at facilities in the Columbia Plateau (Johnson 2005; Arnett et al. 2008; Baerwald and Barclay 2009).

Silver-haired bat: Currently available survey methods cannot be used for estimating bat abundance. Nonetheless, the detection of silver-haired bat (a Sensitive-Vulnerable species) at 11 of the 12 acoustic monitoring sites (Table P-2) suggests that this species is relatively common and flies through much of Wheatridge during the late summer and fall months (its migration period). The Project does not provide suitable breeding habitat. The potential adverse effect to this species is collision with turbines (Table 13 of Attachment P-1), which is most likely during migration (August through October; Figure 13 of Attachment P-1) and at wind speeds up to approximately 5 s^{-1} (Horn et al. 2008). This species flies rather high and may not use echo-location while migrating (Kunz et al. 2007; Cryan and Barclay 2009). It comprises 44.9% of documented bat fatalities at Columbia Plateau wind energy facilities (Tables 12 and 13; Figure 13). Individuals of this species are likely at moderate to high risk from the proposed Wheatridge Wind Energy Facility. The potential risk to populations and to the species as a whole is unknown; however, that risk is expected to be less at

Wheatridge than at facilities sited nearer the species' preferred forest habitats and far less than at facilities in the eastern United States where fatalities tend to be more than ten times greater than at facilities in the Columbia Plateau (Johnson 2005; Arnett et al. 2008; Baerwald and Barclay 2009).

California myotis: California myotis (a Sensitive-Vulnerable species) was detected at one acoustic monitoring site (Table P-2). The Project provides little or no suitable breeding habitat, but likely provides some suitable foraging habitat. This species generally flies at heights below rotor level, and has not been documented as a fatality at any Columbia Plateau wind energy facilities (Table 13 of Attachment P-1). Based on these factors, populations of this species are deemed to be at no risk from the proposed Wheatridge Wind Energy Facility.

Small-footed myotis: Currently available survey methods cannot be used for estimating bat abundance. Nonetheless, the detection of small-footed myotis (a federal Species of Concern) at nine of the 12 acoustic monitoring sites (Table 2) suggests that this species is relatively common and flies through much of Wheatridge during the late summer and fall months. The Project provides little or no suitable breeding habitat, but likely provides some suitable foraging habitat. This species generally flies at heights below rotor level, and has not been documented as a fatality at any Columbia Plateau wind energy facilities (Table 13 of Attachment P-1). Based on these factors, populations of this species are deemed to be at no risk from the proposed Wheatridge Wind Energy Facility.

Long-eared myotis: Long-eared myotis (a federal Species of Concern) was detected at one acoustic monitoring site (Table P-2). The Project provides little or no suitable breeding habitat, but likely provides some suitable foraging habitat. This species generally flies at heights below rotor level, and has not been documented as a fatality at any Columbia Plateau wind energy facilities (Table 13 of Attachment P-1). Based on these factors, populations of this species are deemed to be at no risk from the proposed Wheatridge Wind Energy Facility.

Long-legged myotis: Long-legged myotis (a Sensitive-Vulnerable species) was detected at one acoustic monitoring site (Table P-2). The Project provides little or no suitable breeding habitat, but likely provides some suitable foraging habitat. This species generally flies at heights below rotor level, and has not been documented as a fatality at any Columbia Plateau wind energy facilities (Table 13 of Attachment P-1). Based on these factors, populations of this species are deemed to be at no risk from the proposed Wheatridge Wind Energy Facility.

Mule deer: The potential adverse effect to mule deer is loss of suitable habitat, which is of greatest concern in the designated winter range (ODFW 2013; Figure P-1). To the extent feasible, construction of facilities that lie within designated mule deer winter range will be accomplished outside of winter season (December 1 through March 31) to avoid temporary displacement of wintering deer. Where this avoidance is not feasible, the Developer will meet with ODFW personnel to discuss potential mitigation measures such as habitat improvement (as of revegetated grasslands), weed control, or spring development.

Concerns have been raised that operation of wind energy facilities may result in the displacement of mule deer from remaining suitable habitat (WEST 2010). The study from which this conclusion

came did not control for a number of variables likely to have a greater among-year effect (than wind energy facilities) on mule deer distribution, and this concern is belied by abundant anecdotal evidence of this species' foraging, resting, and even calving in very close proximity to turbines, roads, and other facilities (see, e.g., Kronner et al. 2008b).

6.0 Measures to Avoid, Minimize, or Mitigate Impacts – OAR 345-021-0010(1)(p)(G)

6.1 Avoidance and Minimization

This section describes measures to avoid, minimize, and mitigate for impacts to Sensitive and other wildlife species and their habitats, and describes how those measures are expected to achieve the habitat mitigation goals of OAR 635-415-0025. Section *6.1.1* describes avoidance and minimization measures that have been taken during design and micrositing of Project facilities. Sections *6.1.2* and *6.1.3* describe measures that will be taken during construction and operation, respectively, of the Project; many of these measures are expected to become conditions of the Site Certificate. Section 6.2 describes measures that will be taken to mitigate for those impacts that remain after avoidance and minimization measures. Section 6.3 describes how these avoidance, minimization, and mitigation measures are expected to achieve ODFW's habitat mitigation goals.

The Applicant will implement a Revegetation Plan, a Habitat Mitigation Plan, and a Wildlife Monitoring and Mitigation Plan, each of which will be crafted in consultation with ODFW and ODOE. Draft versions of these plans can be found as Attachments P-2, P-3, and P-4, respectively.

In the following sections, the primary impacts to Sensitive species and their habitats addressed by measures to avoid, minimize, and/or mitigate are:

- Loss of suitable habitat
- Disturbance (during breeding or other critical times)
- Direct fatality (through collision with moving rotors, with meteorological tower guy wires, or with Project vehicles, or through electrocution from transmission lines)

Of the wildlife species discussed in this exhibit, those for which these potential impacts constitute a concern are:

- Swainson's hawk (disturbance to breeding attempts, direct fatality from collision or electrocution)
- Ferruginous hawk (disturbance to breeding attempts, direct fatality from collision or electrocution)
- Golden eagle (direct fatality from collision or electrocution)
- Burrowing owl (habitat loss, disturbance to breeding attempts)
- Long-billed curlew (habitat loss, disturbance to breeding attempts)
- Loggerhead shrike (habitat loss)
- Grasshopper sparrow (habitat loss)

- White-tailed jackrabbit (habitat loss, direct fatality from collision with vehicles)
- Hoary bat (direct fatality from collision with turbines)
- Silver-haired bat (direct fatality from collision with turbines)
- Mule deer (habitat loss, seasonal disturbance, direct fatality from collision with vehicles)

6.1.1 During Facility Design and Micrositing

Design and micrositing of facilities was done in such a way as to avoid all impacts to Category 1 habitats.

Further, Project design and micrositing was done to maximize the placement of facilities in Developed–Dryland Wheat habitat, thereby minimizing impacts to other habitats more useful to Sensitive and other wildlife species, including the Oregon Conservation Strategy Habitats, Basin Big Sagebrush Shrub-steppe and Native Perennial Grassland. These measures are expected to minimize impacts to wildlife generally and to ferruginous hawk, golden eagle, peregrine falcon, burrowing owl, long-billed curlew, loggerhead shrike, grasshopper sparrow, white-tailed jackrabbit, and mule deer in particular.

Project design ensured the avoidance of any identified nests of Swainson's hawk, ferruginous hawk, or other raptor species. Micrositing also minimized the possibility of disturbance to breeding attempts of raptor species, as planned facilities were moved away from identified nests to the extent possible. In the case of golden eagle nests, facility design was changed to create a buffer from identified nests of approximately 4 miles. (The smallest turbine-nest distance of the proposed layout is 3.85 miles, and there were no documented breeding attempts at this nest or territory during the four years of monitoring.)

Other design aspects undertaken to minimize impacts to Sensitive and other wildlife species and their habitats include:

- Project roads will involve the use and improvement of existing roads as much as possible.
- Collector lines will be buried to the extent feasible in the temporarily disturbed road shoulders.
- Overhead collector lines and transmission intraconnection lines will be constructed in accordance with the latest Avian Power Line Interaction Committee (APLIC) recommendations (APLIC, 2006). This is expected to minimize the risk of electrocution to raptors generally, and to Swainson's hawk, ferruginous hawk, and golden eagle in particular.
- Permanent meteorological towers will be unguyed.
- Preconstruction surveys will be conducted to identify any changes (since the latest surveys were conducted) in the location of Sensitive species, particularly Washington ground squirrel (addressed in Exhibit Q) and nests of Swainson's hawk, ferruginous hawk, and burrowing owl (to avoid disturbance during nesting).

- Prior to construction, maps will be provided to ODOE showing final Project design; this will identify potential seasonal constraints upon construction (including active breeding attempts of raptors or long-billed curlew in proximity to facilities; see section *6.1.2.1*).

6.1.2 During Construction

Several measures for avoiding and minimizing impacts to wildlife and plants—including state Sensitive species—will be implemented during Project construction.

Construction monitoring will be conducted by a qualified biologist. This monitoring will include spring surveys to ensure that new active breeding attempts of Swainson's hawk, ferruginous hawk, or burrowing owl have not been initiated in proximity to where facilities are to be constructed. Seasonal restrictions on construction activities will be applied according to the following ODFW breeding season and distance standards for the Oregon Columbia Plateau:

Swainson's hawk: 0.25 mi; April 1–August 15

Ferruginous hawk: 0.25 mi; March 15–August 15

Burrowing owl: 0.25 mi; April 1–August 15

Monitoring will also include environmental training for all construction and Project personnel, exclusion flagging and temporary fencing as appropriate to identify Category 1 and other important habitats where no construction activities will be allowed, and oversight of permit compliance during construction.

As appropriate, dust abatement will be applied to gravel roads used during construction to minimize deposition of dust on Project vegetation.

Prior to construction, the Applicant will be expected to have a weed control plan in place and approved by Morrow and Umatilla Counties. This plan will include appropriate measures for the prevention of the spread of noxious weeds (as identified in Morrow County ordinance No. MC-C-3-90 and No. MC-C-2-99 Appendices A and B) during construction. It will also include monitoring for the establishment of noxious weeds and, pursuant to consultation with county weed control managers, appropriate actions for control and eradication of such noxious weeds. Weed control measures specified in the Morrow County Ordinances will be applied on the much smaller portion of the Project in Umatilla County, pursuant to agreement with the respective county weed managers.

Speed limits will be in force for all construction and other Project personnel throughout the construction period. These speed limits will be implemented for the purpose (among others) of minimizing the possibility of injury or death of wildlife generally, and of white-tailed jackrabbit and mule deer in particular.

Prior to construction, the Applicant will be expected to have a fire control plan in place and approved by Morrow and Umatilla Counties.

6.1.3 During Operation

After Project construction, areas where habitat was temporarily disturbed as a result of construction activities will be restored to their original conditions according to provisions in the Revegetation Plan (draft concepts for which are included as Attachment P-2.)

Both temporary habitat disturbance associated with construction activities and permanent habitat loss will be mitigated for according to provisions of the Habitat Mitigation Plan (draft concepts for which are included as Attachment P-3).

A Wildlife Monitoring and Mitigation Plan (for which draft concepts are included as Attachment P-4) will be implemented. Components of this plan will include ongoing environmental training for Project personnel and reporting requirements governing incidental wildlife injuries and deaths on Project roads.

Speed limits that will minimize the likelihood of death or injury of wildlife generally—and of white-tailed jackrabbit and mule deer in particular—are expected to be implemented throughout the life of the Project.

Prior to construction, the Applicant will be expected to have a weed control plan in place and approved by Morrow and Umatilla Counties.

An approved fire control plan will be implemented throughout the life of the Project; this is expected to minimize undesired impacts to existing vegetation and wildlife habitats, including the state Sensitive species and other species addressed in this exhibit.

6.2 Mitigation

After avoidance and mitigation measures have been undertaken, there will remain some impacts to wildlife habitat and some potential impacts to wildlife. Temporary and permanent habitat loss will be mitigated for according to ODFW standards in a Habitat Mitigation Plan, which will be a condition of the Site Certificate and draft concepts for which can be found as Attachment P-3. Included in this plan will be measures for conserving and enhancing sufficient acreages of wildlife habitat to compensate for those acreages temporarily or permanently impacted by Project construction.

The final Habitat Mitigation Plan will be crafted by ODOE in cooperation with the Applicant and ODFW. It will entail protection and enhancement of one or more mitigation sites. This protection will be—at a minimum—for the duration of the Project. The Plan will include success criteria and provisions for monitoring whether mitigation goals are achieved.

It is anticipated that some compensatory mitigation may be required by the USFWS specifically for potential impacts to golden eagles. Such mitigation would be described in a separate Eagle Conservation Plan as part of the Eagle Take Permit process between the Applicant and the USFWS.

6.3 Compliance with ODFW Mitigation Goals – OAR 635-415-0025

The preliminary site evaluation, site characterization, and field studies conducted at Wheatridge led to the identification of one listed plant species and one listed wildlife species (Exhibit Q), and several state Sensitive bird and mammal species with some use of the proposed Project area. Some of these—notably Washington ground squirrel (addressed in Exhibit Q), ferruginous hawk, and golden eagle—affected siting and micrositing of facilities. Areas of use and nest sites of these and other Sensitive species were avoided during Project design, and impacts to these species and their habitats were minimized by facility siting and micrositing. Further minimization will be accomplished during the construction and operation of the Project through a variety of practices and constraints, described in Sections *6.1.2* and *6.1.3* above, and in the Revegetation Plan (as proposed in Attachment P-2) and Habitat Mitigation Plan (as proposed in Attachment P-3). Remaining potential impacts will be mitigated for, as described in Section 6.2 above and in the Wildlife Monitoring and Mitigation Plan (as proposed in Attachment P-4). Together, the efforts that have been and will be used at the Wheatridge Wind Energy Facility to avoid, minimize, and mitigate for adverse impacts to Sensitive plants, fish, wildlife, and their habitats are expected to provide full compliance with the ODFW mitigation goals of OAR 635-415-0025.

7.0 Monitoring Program – OAR 345-021-0010(1)(p)(H)

Monitoring of the success of proposed measures to avoid, minimize, and mitigate impacts to Sensitive plants, fish, wildlife, and their habitat will be accomplished as part of the Revegetation Plan, the Habitat Mitigation Plan, and the Wildlife Monitoring and Mitigation Plan.

As part of the Revegetation Plan (as proposed in Attachment P-2), an independent expert (botanist or habitat biologist) will monitor the success of efforts to restore portions of the Project where temporary impacts occur during construction.

As part of the Habitat Mitigation Plan (as proposed in Attachment P-3), there will be regular monitoring of the Habitat Mitigation Area to assess whether criteria for conservation and enhancement have been achieved.

The Wildlife Monitoring and Mitigation Plan (as proposed in Attachment P-4) identifies methods—designed in cooperation with ODFW and USFWS—for assessing the impacts to Sensitive species of the construction and operation of the Project. Monitoring associated with this plan will include fatality monitoring, carcass removal trials, searcher efficiency trials, and periodic raptor nest monitoring; observations of listed and Sensitive wildlife and plant species will be documented during monitoring activities and will be submitted with monitoring reports. Also included will be training of Project personnel in procedures for discovering, tracking, and reporting injured and dead wildlife found on the Project.

8.0 Conclusion

This Exhibit is deemed to have provided all of the information necessary for a finding by the Council that the design, construction, and operation of the Wheatridge Wind Energy Facility (as designed as of November 2014), taking into account proposed mitigation measures, are consistent with the fish and wildlife mitigation goals and standards of OAR 635-415-0025 and that the Applicant has demonstrated compliance with OAR 345-022-0060.

9.0 Submittal Requirements and Approval Standards

9.1 Submittal Requirements

Table P-5: Submittal Requirements Matrix

Requirement	Location
OAR 345-021-0010(1)(p) Information about the fish and wildlife habitat and the fish and wildlife species, other than the species addressed in subsection (q) that could be affected by the proposed facility, providing evidence to support a finding by the Council as required by OAR 345-022-0060. The applicant shall include:	
OAR 345-021-0010(1)(p)(A) A description of biological and botanical surveys performed that support the information in this exhibit, including a discussion of the timing and scope of each survey.	Section 2.2
OAR 345-021-0010(1)(p)(B) Identification of all fish and wildlife habitat in the analysis area, classified by the habitat categories as set forth in OAR 635-415-0025 and a description of the characteristics and condition of that habitat in the analysis area, including a table of the areas of permanent disturbance and temporary disturbance (in acres) in each habitat category and subtype.	Sections 3.0 and 5.1; Table P-4
OAR 345-021-0010(1)(p)(C) A map showing the locations of the habitat identified in (B).	Attachment P-1 Figures 4a, b. c and 5a, b, c
OAR 345-021-0010(1)(p)(D) Based on consultation with the Oregon Department of Fish and Wildlife (ODFW) and appropriate field study and literature review, identification of all State Sensitive Species that might be present in the analysis area and a discussion of any site-specific issues of concern to ODFW.	Sections *2.1.5*, 4.1, and 5.2
OAR 345-021-0010(1)(p)(E) A baseline survey of the use of habitat in the analysis area by species identified in (D) performed according to a protocol approved by the Department and ODFW.	Section 4.2
OAR 345-021-0010(1)(p)(F) A description of the nature, extent and duration of potential adverse impacts on the habitat identified in (B) and species identified in (D) that could result from construction, operation and retirement of the proposed facility.	Sections 5.1 and 5.2
OAR 345-021-0010(1)(p) (G) A description of any measures proposed by the applicant to avoid, reduce or mitigate the potential adverse impacts described in (F) in accordance with the ODFW mitigation goals described in OAR 635-415-0025 and a discussion of how the proposed measures would achieve those goals.	Section 6

Table P-5: Submittal Requirements Matrix	
Requirement	**Location**
OAR 345-021-0010(1)(p)(H) A description of the applicant's proposed monitoring plans to evaluate the success of the measures described in (G).	Section 7

9.2 Approval Standard

Table P-6: Approval Standard	
Requirement	**Location**
OAR 345-022-0060 Fish and Wildlife Habitat	
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 the fish and wildlife habitat mitigation goals and standards of OAR 635-415-0025 in effect as of September 1, 2000.	Sections 6.3, 8.0, and 9.1

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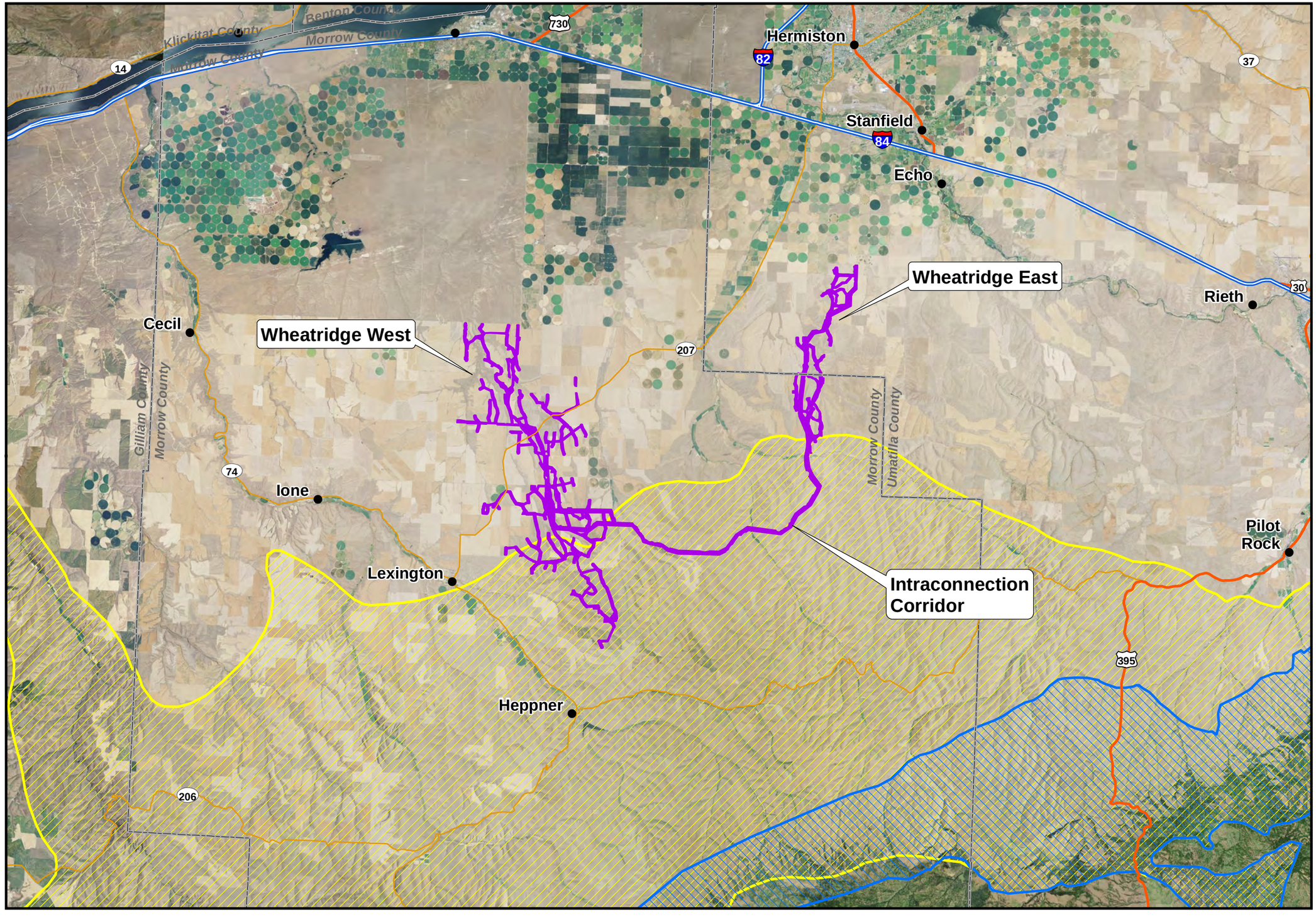
Figures

Figure P-1

Wheatridge Wind Energy Facility

ODFW Deer and Elk Winter Range in the Vicinity of the Project

Morrow and Umatilla Counties, OR
December 2014



- Site Boundary
- County Boundary
- City/Town
- Interstate Highway
- Federal Highway
- State Highway
- Elk Winter Range
- Deer Winter Range

1:300,000 WGS84 UTM 11

0 2.5 5 10 15 20 25 30 35 40 45 50 Miles

Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries / Oregon Dept. Fish & Wildlife: deer and elk winter range / USDA NAIP: background imagery

TETRA TECH

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Figure P-2

Wheatridge Wind Energy Facility

Avian Use Study Plots

Morrow and Umatilla Counties, OR
December 2014

Wheatridge West

Wheatridge East

Intraconnection Corridor

Umatilla County

Morrow County

Lexington

207

74

A B C D E F G H I J K L M N O P

- Site Boundary
- Avian Use Study Plot (Wheatridge East)
- Avian Use Study Plot (Wheatridge West)
- County Boundary
- City/Town
- State Highway

N

1:140,000 WGS84 UTM 11

0 1 2 4 6 8 10 12 14 16 18 20 Miles

Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries / NW Wildlife Consultants: avian use study plots / USDA NAIP: background imagery

TETRA TECH

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Figure P-3

Wheatridge Wind Energy Facility

Raptor Nest Survey Area

Morrow and Umatilla Counties, OR
December 2014

Wheatridge West

Wheatridge East

Intraconnection Corridor

Morrow County

Umatilla County

Ione

Lexington

Heppner

207

74

- Site Boundary
- Raptor Nest Survey Area
- County Boundary
- City/Town
- Interstate Highway
- Federal Highway
- State Highway

1:175,000 WGS84 UTM 11

0 1 2 4 6 8 10 12 14 16 18 20 Miles

Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries / NW Wildlife Consultants: raptor nest survey area / USDA NAIP: background imagery

TETRA TECH

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Wheatridge West

Wheatridge East

Umatilla County

Morrow County

207

74

Lexington

Intraconnection Corridor

1:140,000 WGS84 UTM 11

0 1 2 4 6 8 10 12 14 16 18 20 Miles

Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries / NW Wildlife Consultants: special status vertebrate survey areas / USDA NAIP: background imagery

Figure P-4

Wheatridge Wind Energy Facility

Special Status Vertebrate Wildlife Species Survey Area

Morrow and Umatilla Counties, OR

December 2014

- Site Boundary
- County Boundary
- City/Town
- State Highway

Survey Area

- Wheatridge West
- Wheatridge East
- Intraconnection Corridor

TETRA TECH

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Figure P-5

Wheatridge Wind Energy Facility

Bat Detector Locations

Morrow and Umatilla Counties, OR
December 2014

Wheatridge West

Wheatridge East

Umatilla County

Morrow County

207

74

Lexington

Intraconnection Corridor

- Site Boundary
- County Boundary
- Bat Detector Location
- City/Town
- State Highway

1:140,000 WGS84 UTM 11

0 1 2 4 6 8 10 12 14 16 18 20 Miles

Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries / NW Wildlife Consultants: bat detector locations / USDA NAIP: background imagery

TETRA TECH

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Figure P-6

Wheatridge Wind Energy Facility

Detections of Special Status Vertebrate Wildlife Species

Morrow and Umatilla Counties, OR
December 2014

Wheatridge West

Wheatridge East

Intraconnection Corridor

Umatilla County

Morrow County

207

74

Lexington

- Site Boundary
- County Boundary
- City/Town
- State Highway

Special Status Vertebrate Wildlife Detection

Wheatridge West
- Grasshopper Sparrow
- Jackrabbit Pellets (White or Black-tailed)
- Long-billed Curlew
- Loggerhead Shrike
- White-tailed Jackrabbit

Wheatridge East
- Grasshopper Sparrow
- Jackrabbit Pellets (White or Black-tailed)
- Long-billed Curlew
- White-tailed Jackrabbit

Intraconnection Corridor
- Grasshopper Sparrow
- Jackrabbit Pellets (White or Black-tailed)
- Long-billed Curlew
- White-tailed Jackrabbit

1:140,000 WGS84 UTM 11

0 1 2 4 6 8 10 12 14 16 18 20 Miles

Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries / NW Wildlife Consultants: special status vertebrate detections / USDA NAIP: background imagery

TETRA TECH

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Attachments

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Attachment P-1:

Wheatridge Ecological Investigations Report

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Ecological Investigations Report for the Wheatridge Wind Energy Project

Morrow and Umatilla Counties, Oregon

Prepared for:

Wheatridge Wind Energy, LLC
245 W. Main Street, Suite 200
Ione, Oregon 97843

Prepared by:

Rick Gerhardt and Brett Anderson
Northwest Wildlife Consultants, Inc.
815 NW 4th Street
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September 29, 2014

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Appendices

1.0 INTRODUCTION

Wheatridge Wind Energy, LLC, (Applicant) is proposing to develop a wind energy facility on approximately 13,100 acres of privately-owned land in eastern Morrow County and western Umatilla County, Oregon. As currently designed, Wheatridge Wind Energy Facility (the Project) will have a generating capacity of up to 500 megawatts using an array of up to 292 turbines. The Project is comprised of three components, Wheatridge West and Wheatridge East (separate areas of turbine siting) and one or two 230-kilovolt overhead transmission lines connecting these (Intraconnection Lines in the Intraconnection Corridor); all portions lie primarily to the north and east of Lexington and to the northeast of Heppner, Oregon (Figure 1).

The Applicant contracted Northwest Wildlife Consultants, Inc. (NWC) to prepare an ecological study plan and to conduct preconstruction biological reviews and surveys commensurate with obtaining a permit from the Oregon Energy Facility Siting Council (EFSC) and following the tiered approach in the U.S. Fish and Wildlife Service (USFWS) land-based wind energy guidelines (USFWS, 2012a). This ecological investigations report details the methods and results of preconstruction investigations and discusses potential risks to wildlife and their habitats associated with the proposed Project following standards set forth for pre-project assessment in the Oregon Columbia Plateau Ecoregion wind energy siting and permitting guidelines (USFWS, 2008a) and the land-based wind energy guidelines (USFWS, 2012a).

This report also serves as the source for information to be included in Exhibits P (wildlife habitat) and Q (Threatened and Endangered plant and wildlife species) of the Application for a Site Certificate. As such, the investigations described herein were designed to address all Oregon Administrative Rules (OARs) governing the processes of siting and permitting such energy facilities, including OARs 345-021-0010(1)(p) and (q), OAR 345-022-0060, OAR 345-022-0070, and OARs 635-415-0000 through 0025.

It is understood that Project facilities and construction activities will avoid aquatic habitats. Therefore, fish habitat, amphibian breeding habitat, and potential wetland-associated rare plants were not addressed during field surveys.

Because this report follows the tiered approach of the land-based wind energy guidelines (USFWS, 2012a), it is anticipated that sections of this report may form the foundation of a separate Project-specific Bird and Bat Conservation Strategy (BBCS) as outlined in those guidelines.

2.0 PRELIMINARY SITE EVALUATION AND SITE CHARACTERIZATION

A review of available literature and other resources was conducted to identify the rare plant and special status vertebrate wildlife species potentially occurring within the general Project area. This section focuses on information obtained before field studies were conducted. Records of rare, Threatened, and Endangered plant and wildlife species were requested from the Oregon Biodiversity Information Center (ORBIC; Appendix A). Also accessed were the USFWS county-level special status species lists for Morrow and Umatilla Counties (USFWS, 2012b and c; also found as Appendix B1 and B2 of this report). Other information was obtained from various sources, including the Oregon Department of Fish and Wildlife (ODFW), and raptor nest information was reviewed and records placed in a confidential nest database. Data from these inquiries were used in conjunction with other information (e.g.,

results of ongoing surveys of the area, interviews with ODFW biologists, NWC staff biologists' knowledge, Oregon Eagle Foundation data requests) to develop lists of special status plant and vertebrate wildlife species with potential for occurrence in the Project area.

These pre-field reviews enabled the answering of the questions in Tier 1 (preliminary site evaluation) and Tier 2 (site characterization) of the land-based wind energy guidelines (USFWS, 2012a) and provided Wheatridge Wind Energy, LLC with the information relevant for making the decisions associated with each of these tiers and for meeting EFSC project permitting standards. The resulting lists of species of concern with the potential for occurrence in the area were then used to inform the design and timing of field studies (addressed in the guidelines under Tier 3) used to document the wildlife and habitats on the Project, to enable the predicting of Project impacts to species of concern and their habitats, and to facilitate avoidance and minimization of impacts during Project design, micrositing, construction, and operation.

2.1 Oregon Biodiversity Information Center

Records of rare, Threatened, and Endangered plant and wildlife species were requested from ORBIC in early 2011 and received by NWC on March 18, 2011. The area for which records were requested was the Project and a ten-mile (16.12 km) buffer of the Project boundary (as of March 2011). The ten-mile buffer was specifically to obtain historical information on nesting by bald and golden eagles. For all other species, only results within five miles (8.06 km) of the Project boundary are included in this report; this is in keeping with EFSC permit application standards. All information received, including records at distances greater than five miles from the current Project boundary, were reviewed to aid in compiling lists of vertebrate wildlife (Appendix C), bat (Appendix D), and plant species (Appendix E) with potential for occurrence in the general area. For some records, this review entailed recognizing a change in a species' status (between the time of the record's entry and the present).

Results of the ORBIC request are described below by species for each Project component.

2.1.1 Wheatridge West

Within five miles of the Wheatridge West portion of the proposed Project, the ORBIC records included two mammalian species (17 records), six avian species (nine records), one turtle record, and three plant species (three records).

Mammals

- Washington ground squirrel (*Urocitellus washingtoni*): federal Candidate, State Endangered, 16 records
- White-tailed jackrabbit (*Lepus townsendii*): State Sensitive–Vulnerable, one record

Birds

- Ferruginous hawk (*Buteo regalis*): State Sensitive–Critical, two records of nesting locations
- Swainson's hawk (*Buteo swainsoni*): State Sensitive–Vulnerable, two records of nesting locations
- Western burrowing owl (*Athene cunicularis hypugea*): State Sensitive–Critical, one record identifying a cluster of numerous nesting locations across three years (1995-1997)
- Long-billed curlew (*Numenius americanus*): State Sensitive–Vulnerable, two records, including one of nesting location
- Grasshopper sparrow (*Ammondramus savannarum*): State Sensitive–Vulnerable, one record of numerous detections
- Black-throated sparrow (*Amphispiza bilineata*): ORBIC tracked species, one record of nesting

Amphibians, Reptiles, and Turtles

- Painted turtle (*Chrysemys picta*): State Sensitive–Critical, one record

Vascular Plants and Moss

- Laurent's milk-vetch (*Astragalus collinus var. laurentii*): State Threatened, one record
- Moss (*Aloina bifrons* and *Bryoerythrophyllum columbianum*): both ORBIC tracked species, two records

Of these, four records of Washington ground squirrel and one record of long-billed curlew were within the Wheatridge West Project boundary. All of these were from between 1987 and1990.

2.1.2 Wheatridge East

Within five miles of the Wheatridge East portion of the proposed Project, the ORBIC records included one mammalian species (nine records), one invertebrate species (two records), one fish species (two records), and two plant species (two records). None of these records were within the Wheatridge West Project boundary. A single eagle nest record occurred within the ten-mile analysis area.

Mammals
- Washington ground squirrel (*Urocitellus washingtoni*): federal Candidate, State Endangered, 9 records

Birds
- Bald eagle (*Haliaeetus leucocephalus*): one record of a nest (nearly 10 miles from the Project); listed as State Threatened in the ORBIC records, this species is no longer listed federally or in Oregon

Fish
- Steelhead, Middle Columbia River ESU, summer run (*Oncorhynchus mykiss* population 28): State Sensitive–Critical, two records

Invertebrates
- Western ridged mussel (*Gonidea angulata*): ORBIC tracked species, two records

Vascular Plants and Moss
- Laurent's milk-vetch (*Astragalus collinus var. laurentii*): State Threatened, one record
- Retrorse sedge (*Carex retrorsa*): ORBIC tracked species, one record

2.1.3 Transmission Intraconnection Corridor

Within five miles of the Intraconnection Corridor, the ORBIC records included one mammalian species (seven records) and one invertebrate species (two records). None of these records were within the Intraconnection Corridor itself.

Mammals
- Washington ground squirrel (*Urocitellus washingtoni*): federal Candidate, State Endangered, seven records

Invertebrates
- Western ridged mussel (*Gonidea angulata*): ORBIC tracked species, two records

2.2 United States Fish and Wildlife Service Morrow and Umatilla County Species Lists

The USFWS lists of Endangered, Threatened, Proposed, and Candidate species, and Species of Concern for Morrow and Umatilla Counties were accessed in March 2011 and again in December 2012; the December 2012 versions can be found as Appendices B1 and B2 of this document. The lists encompass a range of habitats within each entire county, including some species that have no potential for occurrence within or near the Project boundary. Wheatridge East lies partly in Morrow County and partly in Umatilla County; Wheatridge West and the Intraconnection Corridor lie entirely within Morrow County, though the eastern edge of the Intraconnection Corridor is within five miles of Umatilla County.

There were no federal listed Threatened, Endangered, or Proposed species results on the Morrow County list, and one Threatened species (bull trout) on the Umatilla County list. The following vertebrate wildlife and vascular plant species from the USFWS Morrow County and Umatilla County lists have the potential to occur within five miles of the Project boundary (but not necessarily within the Project boundary itself).

Listed Vertebrate Animal (Wildlife and Fish) and Plant Species

Bull trout (*Salvelinus confluentus*)

Candidate Species

Washington ground squirrel (*Urocitellus washingtoni*)

Species of Concern

Mammals

- Pallid bat (*Antrozous pallidus pacificus)*
- Townsend's western big-eared bat *(Corynorhinus townsendii townsendii)*
- Silver-haired bat (*Lasionycteris noctivagans*)
- Small-footed myotis (*Myotis ciliolabrum*)
- Long-eared myotis (*Myotis evotis*)
- Long-legged myotis *(Myotis volans)*
- Yuma myotis (*Myotis yumanensis*)

Birds

- Northern goshawk (*Accipiter gentilis*)
- Western burrowing owl (*Athene cunicularia hypugaea*)
- Ferruginous hawk (*Buteo regalis*)
- Tricolored blackbird (*Agelaius tricolor*)
- Olive-sided flycatcher (*Contopus cooperi*)
- Willow flycatcher (*Empidonax trailii adastus*)
- Yellow-breasted chat (*Icteria virens*)
- Lewis' woodpecker (*Melanerpes lewis*)
- Mountain quail (*Oreotyx pictus*)
- White-headed woodpecker (*Picoides albolarvatus*)

Amphibian, Reptiles, and Turtles

- Northern sagebrush lizard (*Sceloporus graciosus graciosus*)

Fish

- Margined sculpin (*Cottus marginatus)*
- Pacific lamprey (*Lampetra tridentata*)

Vascular Plants

- Robinson's onion (*Allium robinsonii)*
- Laurent's milk-vetch (*Astragalus collinus var. laurentii*)
- Dwarf evening primrose (*Camissonia pgmaea)*
- Sessile mousetail (*Myosurus sessilis)*
- Douglas' clover (*Trifolium douglasii)*

One other Threatened fish species, Middle Columbia River steelhead (summer run), can be found within these counties and within five miles of the Project boundary. It does not appear in the USFWS county lists because—as an anadromous species—it falls under the jurisdiction not of the USFWS but of the National Oceanic and Atmospheric Administration's National Marine Fisheries Service.

2.3 Review for Information on Eagles

The bald eagle and golden eagle are protected under the federal Bald and Golden Eagle Protection Act (BGEPA; 16 U.S.C. 668-668c, 1940). In response to a desire by the USFWS to know more about golden eagles in the vicinity of wind projects, NWC conducted a review

for nest records within ten miles of the Project. Bald eagle nest data were obtained as well. Nest information available from nearby wind projects (provided by ODFW), state records, NWC personal records, local bird group records, and ORBIC were reviewed.

ORBIC does not actively track golden eagles or their nest sites, but information on this species is available from their Point of Observation Database (PODS), a repository for information on less-rare vertebrates in Oregon begun in 2006. PODS was checked for records of golden eagle nests within ten miles of the Project boundary. Many of these observations were reported to ORBIC PODS by the Oregon Breeding Bird Atlas, which ranks detections by three categories—possible breeding, probable breeding, or confirmed breeding. The Oregon Breeding Bird Atlas does not report the actual geographic location of observations, but rather reports all observations within a hexagon sample unit at the center of that hexagon. Each hexagon covers an area of 634.5 km^2 (245 mi^2, or 156,000 acres), has six sides each with a length of 15.8 km (9.8 mi), and measures 27.4 km (17.0 mi) perpendicularly from side to side (Adamus et al., 2001). Given the coarse nature of this reporting method, it is impossible to ascertain if any of the golden eagle observations reported to ORBIC PODS by the Oregon Breeding Bird Atlas actually occurred within the ten-mile buffer of the Project boundary. These data provide only corroborative evidence of historical use and breeding in the general area by golden eagles.

Review of PODS records (as received from ORBIC July 2011) resulted in identification of seven golden eagle observation records from 1995 through 1999; all were reported to ORBIC PODS by the Oregon Breeding Bird Atlas. Six of the seven records were ranked as possible breeding; one record from 1999 was ranked as confirmed breeding. Exact locations could not be determined from these records, and some may not have been within ten miles of the Project boundary.

Prior to conducting eagle nest surveys (in the spring of 2011), NWC personnel were aware of at least three historical golden eagle breeding territories (each with one or more nests) within ten miles of the Project boundary. This information came from personal knowledge of the area and from interaction with wildlife agency personnel, birders, and staff of The Nature Conservancy (TNC). The known history of these nests and territories is not included in this report; instead, it is anticipated that a separate, eagle-specific report will be compiled and shared with USFWS and ODFW.

2.4 Review for Information on Bats

A habitat assessment and review of databases, published literature, and industry reports was conducted. NWC biologists with experience in studying bats reviewed the full range of Project habitats to determine species likely present at the Project. In addition, bat fatality monitoring results from regional wind projects were reviewed to help assess mortality rates with respect to species likely present at the Project.

Results of the review for bats—including habitat assessment and review of databases, published literature, industry reports, and the field notes of NWC personnel—are found in Appendix D. That appendix lists all bat species with the potential to occur in the Project area, including species of concern and common species. Prior to the subsequent field investigations (Sections 3.11 and 4.11), the most valuable information on bat species occurrence came from similar preconstruction bat species investigations and post-construction fatality monitoring conducted by NWC or others at other Columbia Plateau Ecoregion (CPE) wind energy projects and from personal research and familiarity with bat habitats in the region.

Prior to field investigations, those bat species with special status, susceptibility to collision with turbines, and a likelihood of occurrence at the Project site were deemed to be hoary bat and silver-haired bat. The bat species investigation (Sections 3.11 and 4.11) was expected to validate the presence of these two species. In addition, field investigations were expected to assess the presence of other species of concern and their habitats, particularly Townsend's big-eared bat (which is not, however, expected to be vulnerable to collision with turbines based on species behavior and on fatality data from operating wind projects in the Columbia Basin).

2.5 Conclusion—Preliminary Site Evaluation and Site Characterization

The results of the historical reviews described above can be used to answer the Tier 1 and Tier 2 questions from the land-based wind energy guidelines (USFWS, 2012a). Since the Tier 1 questions are reiterated (at a more specific level) by the Tier 2 questions, this report will answer the latter here. The guidelines were not yet available at the time when this Project was at this stage. Nonetheless, the questions and decision-making formalized in the guidelines are quite similar to those associated with standards set forth for pre-project assessment in the Oregon Columbia Plateau Ecoregion wind energy siting and permitting guidelines (USFWS, 2008a) and assessment practices routinely utilized by NWC (with input from state wildlife agencies, USFWS, and EFSC). For these reasons, it is deemed appropriate to include in this report the answers to the specific questions contained in the 2012 USFWS wind energy guidelines.

1) "Are known species of concern present on the proposed site, or is habitat (including designated critical habitat) present for these species?"

Historical reviews documented four occurrences of Washington ground squirrel and one occurrence of long-billed curlew from within the Wheatridge West portion of the Project. For these and several other species of concern, historical occurrences were obtained within five miles of one or more of the Project components. Moreover, NWC's familiarity with the general area and of the habitats found on the Project suggested the likely occurrence on the Project of several species of concern and of habitat important to them, especially breeding habitat (Appendices C and D). These include Washington ground squirrel, white-tailed jackrabbit, hoary bat, silver-haired bat, ferruginous hawk, Swainson's hawk, bald eagle, golden eagle, western burrowing owl, long-billed curlew, loggerhead shrike, and grasshopper sparrow.

Historical reviews did not identify any critical habitat within the Project area. However, the detection of Washington ground squirrels during field studies would lead to designation of critical habitat that includes the active burrows and a buffer around them (Category 1 habitat under OAR 635-415-0025).

2) "Does the landscape contain areas where development is precluded by law or designated as sensitive according to scientifically credible information? Examples of designated areas include, but are not limited to: federally designated critical habitat; high-priority conservation areas for NGOs; or other local, state, regional, federal, tribal, or international categorizations."

The Project landscape remains attractive for development because of the high proportion of already developed land—in the form of dryland wheat—and the correspondingly low proportion of native wildlife habitat. No areas of the Project landscape were identified as precluding development. Project-specific (Tier 3) wildlife studies were designed to detect species of concern, detections that would in turn result in the designation of critical habitat

with legal protection. In particular, the presence on the Project of Washington ground squirrel would initiate a delineation of the boundary of each area of use and the designation of that area and a buffer extending 785 feet in all directions (in suitable Washington ground squirrel habitat) as Category 1 habitat, a designation that precludes development (OAR 635-415-0025). Special status vertebrate wildlife species surveys (Sections 3.10 and 4.10) were designed to detect this and other terrestrial vertebrate species of concern within 1000 feet of proposed development.

A small portion of the proposed Project area is within designated deer critical winter range (ODFW, 2009; Figure 2); such designation does not, however, preclude development.

3) "Are there plant communities of concern present or likely to be present at the site(s)?"

Historical reviews did not identify any plant communities of concern within the Project boundary. There are, however, a number of plant species with federal or state special status that may occur within the Project area; these were surveyed for as part of the Project-specific biological studies (Sections 3.4 and 4.4). Based on the historical reviews, ORBIC information from the area within five miles of the Project, and the experience of NWC personnel in the general area of the proposed Project, Laurent's milk-vetch, a State Threatened Species and a federal Species of Concern, was expected to have a reasonable likelihood of occurrence on the Project. A list of other plant species with potential for occurrence on the Project area (Appendix E) was compiled and used to inform the timing and locations of rare plant surveys (Sections 3.3 and 4.3).

4) "Are there known critical areas of congregation of species of concern, including, but not limited to: maternity roosts, hibernacula, staging areas, winter ranges, nesting sites, migration stopovers or corridors, leks, or other areas of seasonal importance?"

Prior to the initiation of Project-specific field studies, there were no known critical areas of congregations (maternity roosts, hibernacula, staging areas, winter ranges, leks, migration stopover sites) on the Project area. Concentrations of the State Endangered Washington ground squirrel were expected to be present but localized and fluctuating in size and density from year to year. Ferruginous hawk and Swainson's hawk are among several raptor species likely to be found breeding on the Project. Historical reviews identified golden eagle breeding territories and known nests within ten miles of the Project, but none within the Project boundary. Field studies were designed to verify the presence of these mammalian and avian species of concern on the Project.

A small portion of the proposed Project area is within designated deer critical winter range (ODFW, 2013; Figure 2).

5) "Using the best available scientific information has the developer or relevant federal, state, tribal, and/or local agency identified the potential presence of a species of habitat fragmentation concern?"

Habitat fragmentation has been raised as a potential impact from the construction of new roads associated with wind energy facilities to the State Endangered Washington ground squirrel. This concern has been addressed through the process of establishing a buffer of designated critical (Category 1) habitat around documented detections of this species. As far as NWC is aware, no other species of habitat fragmentation concern have been identified by the Applicant or relevant agency personnel as potentially present on the Project area.

6) "Which species of birds and bats, especially those known to be at risk by wind energy facilities, are likely to use the proposed site based on an assessment of site attributes?"

A number of bird species are likely to use the proposed site. Most of these are protected under the Migratory Bird Treaty Act but do not have other formal designations nor are they considered to be at risk from wind energy facilities based on numerous fatality monitoring studies (at regional wind facilities with habitats similar to those at the Wheatridge Wind Energy Project) conducted or reviewed by NWC.

Some avian species likely to be present are known to be at risk from wind energy facilities. These include non-native gamebirds such as chukar, gray partridge, and ring-necked pheasant, common birds such as horned lark and western meadowlark, and seasonal migrants exemplified by golden-crowned kinglet (a forest nesting species that migrates through the general Project area). Common raptors at risk from operating turbines include American kestrel, red-tailed hawk, and, seasonally, rough-legged hawk.

Species with special designation likely to be present but not at risk from wind energy facilities (that is, not found or infrequently found as fatalities at operating regional wind facilities) include long-billed curlew, loggerhead shrike, grasshopper sparrow, and western burrowing owl.

For other avian species of concern, risk from the proposed project likely depends upon extent of use of the Project area. Such species include Swainson's hawk, ferruginous hawk, and golden eagle (each likely to be present). The year-around avian use study (Sections 3.4 and 4.4), raptor nest survey (Sections 3.5 and 4.5), eagle nest survey (Sections 3.6 and 4.6), multi-year golden eagle nest monitoring (Sections 3.7 and 4.7), and multi-year eagle telemetry studies (Sections 3.8 and 4.8) were designed to obtain a better understanding of the extent of use of the Project area by these and other species.

Two species of bat known to be at risk from wind energy facilities are likely to use the proposed site. These are hoary bat and silver-haired bat; both are State Sensitive-Vulnerable species and federal Species of Concern. Both species have been documented as fatalities at wind energy facilities with similar habitats within the Columbia Plateau Ecoregion.

Other species of bat likely to be present are not generally considered to be at risk from wind energy facilities (though they may occasionally occur as fatalities). The latter include species with special status (pallid bat, small-footed myotis, long-eared myotis, Yuma myotis, long-legged myotis and, potentially, Townsend's big-eared bat) and species currently without special status (little brown bat, big brown bat, and others).

The bat species investigation (Sections 3.12 and 4.12) was designed to verify the presence of species regularly using the Project area.

7) "Is there a potential for significant adverse impacts to species of concern based on the answers to the questions above, and considering the design of the proposed project?"

Historical reviews and NWC's familiarity with the region in which this Project is proposed indicate that there are a number of species of concern that might use the Project to varying degrees. At the conclusion of the site evaluation and site characterization process, however, the potential for significant impacts of the proposed Project to species of concern remained unknown. Biological field studies were therefore designed by NWC (in consultation with the Oregon Department of Fish and Wildlife and the U.S. Fish and Wildlife Service) to better

assess the use of the Project area by these species. Field studies were designed and conducted to identify species of concern, their nests, and their habitats on the Project area and to estimate the extent of temporal and spatial use by such species. In addition, these studies were designed in such a way as to allow for post-construction replication that would allow for assessment of changes over time in the presence of and use by these species of concern.

Although a number of species with special status were identified as likely to occur on the Project (Appendix B), several of these are not expected to be significantly adversely impacted by the construction and operation of the Project (for reasons discussed in Section 5.0). Following site evaluation and site characterization, the list of species of particular concern with regard to this Project were as follows:

- Washington ground squirrel: State Endangered; federal Candidate Species. Likely to occur on Project, with locations having regulatory effect on micrositing of facilities.
- Hoary bat: State Sensitive-Vulnerable. Likely to occur on Project (at least during fall migration); susceptible to collision with turbines; population numbers unknown.
- Silver-haired bat: State Sensitive-Vulnerable; federal Species of Concern. Likely to occur on Project (at least during fall migration); susceptible to collision with turbines; population numbers unknown.
- Ferruginous hawk: State Sensitive-Critical; federal Species of Concern. Likely to breed on Project; believed to be declining regionally and locally; occasionally known to collide with wind turbines; may be displaced from breeding sites by wind facility operations (mainly turbines).
- Swainson's hawk: State Sensitive-Vulnerable; federal Species of Concern. Regionally quite abundant, and likely to breed on Project; experienced population bottleneck due to pesticides used on wintering grounds in 1990's (Woodbridge et al., 1995); susceptible to collision with wind turbines.
- Golden eagle: Known to breed within ten miles of Project; very occasionally found as fatality at wind projects, including at two of 40 operating projects in Oregon (Pagel et al., 2013). Regional population deemed to be stable (or slightly increasing) over the past four decades (Millsap et al., 2013).
- Western burrowing owl: State Sensitive-Critical; federal Species of Concern. Declining nationally and likely locally; may be displaced from breeding habitat by construction activities and operation of turbines (though not particularly susceptible to collision with turbines).
- Long-billed curlew: State Sensitive-Vulnerable; federal Species of Concern. Likely to breed on Project; construction of Project may involve loss of breeding and foraging habitat; not particularly susceptible to collision with turbines.

3.0 FIELD STUDY METHODS

Field studies were designed with the input of ODFW and USFWS biologists and followed protocols developed and used by NWC and others in studying numerous other wind energy developments in the Columbia Plateau and elsewhere. These studies were also designed to answer the following six Tier 3 questions from the land-based wind energy guidelines (USFWS, 2012a):

1) "Do field studies indicate that species of concern are present on or likely to use the proposed site?"

2) "Do field studies indicate the potential for significant adverse impacts on affected populations of species of habitat fragmentation concern?"

3) "What is the distribution, relative abundance, behavior, and site use of species of concern identified in Tiers 1 or 2, and to what extent do these factors expose these species to risk from the proposed wind energy project?"

4) "What are the potential risks of adverse impacts of the proposed wind energy project to individuals and local populations of species of concern and their habitats? (In the case of rare or endangered species, what are the possible impacts to such species and their habitats?"

5) "How can developers mitigate identified significant adverse impacts?"

6) "Are there studies that should be initiated at this stage that would be continued in post-construction?"

3.1 Project and Study Components Agency Correspondence and Site Tours

The investigations components overview (NWC, 2012) was submitted by representatives of Wheatridge Wind Energy, LLC to ODFW District Biologist Steve Cherry (of the Heppner, Oregon office) and to personnel at the La Grande, Oregon field office of the USFWS. These study components were discussed during two site tours (as described in Section 4.1). All field investigations described in this document were conducted according to those study plan protocols provided to and reviewed by ODFW and USFWS. Results of golden eagle telemetry studies were shared with agency biologists on February 14, 2014, and research results were shared with USFWS personnel in a meeting on March 25, 2014. Discussions with USFWS personnel are ongoing, especially in regard to assessing risk of the Project to species of concern (in particular, golden eagles). Survey types and associated survey areas are described in detail below.

3.2 Wildlife Habitat and Deer/Elk Winter Range Mapping, and Habitat Quality Rating

Biologists familiar with Columbia Plateau habitat types and wildlife used a combination of deer and elk winter range information, historical land cover data, color aerial image interpretation, topographic information, soil data, and on-site verification to characterize the range of habitat types present within the Project boundary from the perspective of wildlife use, both general (for species assemblages, e.g. shrub-steppe obligates) and specific (for individual taxa, i.e., special status species).

Habitat types and subtypes within the Project boundary were mapped according to current vegetation rather than according to the potential ecological climax for any given location. Habitat was mapped at the major plant community level utilizing a combination of in-office and on-site delineations. All habitats represented in the Project boundary were field-assessed at some point during the habitat mapping/wildlife survey periods.

Initial habitat boundaries were delineated at a scale of 1:5,000 in a digital geographic information system (GIS) using NAIP 1-meter resolution orthophoto quadrangle county mosaics (USDA-FSA, 2009; USDA-FSA, 2011; USDA-FSA, 2012), digital raster graphics of standard series U.S. Geological Survey (USGS) topographic maps, and the Natural Resources Conservation Service (NRCS) soil survey geographic database (USDA NRCS, 2010). Initial boundaries were delineated based on obvious differences in vegetation, land form, and land use. NWC biologists then ground-verified and adjusted boundaries, further delineated habitat types and subtypes, and developed detailed descriptions of each habitat subtype.

Within a 1000-ft buffer of proposed facilities, limited to the extent of the Project boundary, habitat subtypes are described in further detail, including ecological condition, and rated for habitat quality (Categories 1–6) based on definitions found in Oregon Administrative Rule (OAR) 635-415-0025. This rule defines six habitat categories and establishes mitigation goals and implementation standards for each.

Category	Habitat Characteristics
1	Irreplaceable, essential and limited
2	Essential and limited
3	Essential, or important and limited
4	Important
5	Having high potential to become either essential or important
6	Low potential to become essential or important

In 2013, ODFW began to consider all designated deer and elk winter range to be Category 2 habitat (essential and limited) regardless of habitat type and quality. This decision is at odds with the categorization scheme; fundamental to Category 2 is the notion of its being 'limited,' but designated mule deer winter range comprises 44% of the land in Morrow County.

For the purposes of this report, habitat quality was rated with respect to habitat type and condition with all wildlife species in mind, as has been done historically for energy facility siting, even within the coarser delineation of big game winter range. Resulting acreages are reported by category alongside those obtained using ODFW's designation of big game winter range as Category 2; the latter figures were used in determining habitat mitigation acreages.

3.3 Rare Plant Surveys

Surveys were conducted to identify the presence and location of any special status vascular plant species found on the Project, specifically within anticipated development areas. Target species for the purposes of this survey included all possible Oregon Department of Agriculture (ODA) Candidate, Threatened, and Endangered taxa considered likely to occur in the general region around Wheatridge (Appendix E; there were no Federal Listed or Candidate plant species with likely occurrence). In addition, rare species lacking Federal and State status but which are actively tracked as being rare by ORBIC (2010) were also included in the target list. The timing for these surveys was based on review of the database search results, and incorporated NWC's extensive local knowledge of target vascular plant species and their typical phenology.

Rare plant surveys were conducted by botanists familiar with Columbia Plateau Ecoregion flora; most surveys occurred in 2011, but supplemental surveys occurred in 2012 and 2013. Surveys were conducted in suitable habitat within corridors covering an area extending 500 feet outwards from proposed facilities (in general, a 1,000-foot wide survey corridor for linear facilities). Searches used an intuitively controlled survey method (Elzinga et al. 1998) where all survey corridors were sufficiently traversed to locate all habitats of high suitability for target plant species. Once located, survey efforts intensified within these high suitability habitats, with surveyors walking transects that allowed complete coverage for finding special status plant taxa. This technique provided full coverage of all habitats within survey corridors while allowing field investigators to thoroughly assess all areas that might harbor target vascular plant species. This technique is standard survey protocol for "Survey and Manage" vascular plant species on USDA and USDI lands (USDI BLM and USDA FS, 1999), and has been employed with success at other NWC investigations. During the survey, investigators compiled a list of all vascular plant species encountered (Appendix F).

The primary flora reference employed for the field effort was Hitchcock and Cronquist (1973), with supplemental texts from the 5-volume Flora of the Pacific Northwest (Hitchcock et al., 1955–1969) used as necessary.

3.4 Avian Use Surveys

Field Methods

Avian use surveys were conducted during diurnal hours using a variable circular-plot method to obtain information on species composition and relative abundance of birds (Reynolds et al., 1980) and flight altitudes. Each plot was surveyed for an entire year, and results were analyzed by season.

Survey protocol was similar to that used at other CPE wind energy developments, including Echo Wind Farms (Gritski and Kronner, 2010a), Rattlesnake Road Wind Farm (Kronner et al., 2007a), Wheat Field Wind Farm (Kronner et al., 2008a), Willow Creek Wind Project (Kronner et al., 2007b), Leaning Juniper Phase 1 and Phase II Wind Projects (Kronner et al., 2005a; NWC, 2009), and White Creek Wind Project (Kronner et al., 2005b). Studies on these projects involved recording every avian detection (regardless of distance), though only data from within 800 meters (≈0.5 mile) were used for the analyses. Although this survey is primarily designed for studying use by large birds (i.e., waterfowl and raptors), information for all species observed was recorded. Big game were also recorded when encountered during these surveys.

Twenty-four 800-meter (approx. 0.5-mile) radius study plots were established (16 at Wheatridge West and eight at Wheatridge East) in such a distribution as to provide good coverage of the habitat types and variation in topography of the Project area, inclusive of the proposed turbine strings. Plots were non-overlapping, and were chosen to provide excellent viewing conditions and thorough sampling of the proposed turbine strings. Experienced observers positioned at the center of the plot recorded all wildlife seen or heard during 20-minute point counts. Species, number, flight height, weather, habitat association, behavior and other general data were recorded. Survey starting point locations and times of the day were alternated among surveys to reduce spatial and temporal bias. On occasion, one or more plots were not surveyed in a given week due to weather or access constraints or other conditions.

Survey dates for each season were:

- Winter: January 30–March 12, 2011; October 30–February 11, 2012
- Spring: March 13–May 28, 2011
- Summer: May 29–August 13, 2011
- Fall: August 14–October 29, 2011

At the Wheatridge West portion of the Project, 823 20-minute avian use surveys were conducted between January 30, 2011 and February 11, 2012. By season, there were 299 winter surveys, 176 spring surveys, 173 summer surveys, and 175 fall surveys.

At the Wheatridge East portion of the Project, 406 20-minute avian use surveys were conducted between January 30, 2011 and January 28, 2012. By season, there were 144 winter surveys, 86 spring surveys, 88 summer surveys, and 88 fall surveys.
Flight paths of species of interest (including raptors and some special status species) were hand-plotted on topographic maps in the field. Detections of special status species or species of interest (such as raptors) were recorded while the surveyor traveled between survey plots. Eagle flight paths were inspected, and then digitized into a GIS. Exposure

minutes (time spent flying within 800 meters of the plot center and within 200 meters of the ground) were recorded for all eagles detected during avian use surveys (as outlined in USFWS, 2011).

Data Analysis

Avian-use metrics found in other studies in the region (as mentioned above) were used in conducting the analyses for this Project. In all data analyses, only observations ≤800 m from the plot center were used. Standardized metrics were computed for avian species and species-groups; these included mean use, percent composition, and frequency of occurrence. Because Project avian use surveys were conducted during four consecutive seasons, analyses are comparable to analyses performed for other regional proposed wind projects, many of which are now permitted and operational, and for some of which avian fatality monitoring studies are completed. These comparisons facilitate appropriate assessments of the potential risk to avian species of the proposed Project. Such comparisons will, of course, involve region-wide differences among years (in species numbers) that cannot be controlled for or quantified.

3.5 Raptor Nest Surveys

The objective of raptor nest surveys was to provide information that can be used to predict potential impacts to nesting raptors and to identify options for minimizing, avoiding, or mitigating impacts. Impacts to nesting raptors can potentially occur during the construction or operations phase of the Project, and may include displacement, disturbance during nesting, direct loss of the nest structure, or collision with turbine rotors by individual breeding birds or fledged young.

A raptor biologist and a helicopter pilot experienced at this type of survey flew over the survey area, which included the area proposed for development plus a two-mile (3.2-kilometer) buffer of proposed turbines to locate active and inactive raptor nests. (A larger area was surveyed for eagle nests, as described in Section 3.6 below.) The entire area was surveyed in May, when the majority of large raptor species could be expected to be nesting. Helicopter flight paths avoided occupied dwellings, livestock areas, and restricted zones.

All appropriate nesting areas, including trees, rock formations, and transmission line towers, were flown to provide complete coverage of the survey area. All potential and confirmed raptor nests were recorded, regardless of activity status. Determination of nest status (active, inactive, unknown) was made using a combination of visual clues, such as adult behavior, presence of eggs or young, presence or absence of whitewash (excrement), or observational data from the other surveys being conducted on the Project. Stick nests in trees that appeared to have been constructed and used by common ravens were recorded because these structures could be used by raptors in future years. All nest locations were recorded using a hand-held Global Positioning System (GPS) receiver, and all data were entered into a GIS database.

Aerial surveys are not an effective method to detect the nests of ground-nesting raptors (northern harrier and burrowing and short-eared owls) and some cavity-nesting raptors (American kestrel and small owl species). Surveyors recorded the nests of ground-nesting and cavity-nesting raptors detected while conducting onsite ground-based surveys (described in Section 2.2.9).

Raptor nest surveys were completed for Wheatridge West, Wheatridge East, and the transmission Intraconnection Corridor during the 2011 raptor breeding season. For Wheatridge West and the Intraconnection Corridor, supplemental surveys were conducted in

2012 and 2013 to locate raptor nests on and within two miles of some small areas that had been added to the Project subsequent to the 2011 survey. In addition, information on nesting by special status raptor species was obtained during other 2012 and 2013 field surveys in portions of the Project for which the raptor nest survey was completed in 2011; this information is discussed in the Tier 3 Impacts Assessment (Section 5.0).

3.6 Eagle Nest Survey 2011

In an effort to address concerns by the USFWS about potential impacts of wind energy development to golden eagles (USFWS, 2011), surveys for nests of eagles were conducted in accordance with specific protocols (Pagel et al., 2010). An initial aerial survey was conducted in March 2011, encompassing the Project area and the area within a ten-mile (16.2-kilometer) buffer of the proposed turbines. The area surveyed included all potential eagle nesting habitat, such as cliffs, large trees, and transmission towers. The March survey effort focused on eagle nests; accordingly, only eagle nests were recorded in the area between two and ten miles from the Project, whereas within the two-mile buffer other active raptor nests were also recorded when discovered. All eagle nests, active and inactive, were recorded (as described in Section 2.2.4 above). Inactive nests were identified as those of eagles based on size, structure, and placement (and the raptor biologist's 30+ years of experience with the species and other nesting raptors).

In conjunction with the May multi-species raptor nest survey (described in Section 2.2.4), all active eagle nests identified on the March eagle nest survey were monitored from the air, unless nesting success was monitored effectively from the ground. A third aerial survey—to ascertain productivity—was conducted in June; a breeding attempt was deemed successful if one or more eaglets were observed at an age of 51 days or more (Pagel et al., 2010).

3.7 Eagle Nest Monitoring 2012–2014

All eagle nests identified in 2011 were monitored in 2012, in 2013, and again in 2014. This included aerial monitoring where necessary and ground monitoring where possible. The 2012–2014 efforts were not surveys of all suitable nesting habitat (as in 2011), but in those nesting territories where nests identified in 2011 were found to be inactive or no longer present, additional searching was conducted to try to ascertain if a new nest had been built and was being used. Monitoring of nests found active followed the same protocol as described in Section 2.2.5. The first monitoring effort was conducted in early April each year; the second flight was in early June each year, with additional ground monitoring visits conducted periodically at accessible territories.

3.8 Golden Eagle Telemetry Studies

To complement the avian use studies in understanding the use of the Project by golden eagles, Wheatridge authorized telemetry studies of eagles at the active nest nearest to the Project. The objective was to telemeter the resident adult male and a juvenile produced at this nest. Obtaining diurnal locations for the adult male allows the mapping of an estimate of his home range (and by extension that of the pair), information useful in micrositing of facilities to avoid or minimize impacts. Understanding the natal home range of young is desirable, since there has been concern of the possibility that the period after fledging but prior to dispersal is a time when young eagles—as they are learning to fly and hunt—may be vulnerable to collision with turbines. Thus, the telemetry information from a young bird that is most relevant to the Project is that obtained prior to dispersal from the territory of origin, which generally occurs four to six months after fledging. Telemetry also can provide opportunity to learn about dispersal movements and to determine cause of death (should the subject bird die while still wearing a working transmitter).

Trapping of the adult male took place during the winter, prior to the onset of incubation. The juvenile was captured by climbing into the nest just prior to its fledging. To each target bird, a platform terminal transponder (PTT; solar-powered satellite telemetry unit) was affixed as a backpack. Life expectancy of the PTT is a minimum of two years, during which time hourly diurnal locations are uploaded to satellites approximately every three days and subsequently accessed by NWC personnel. A uniquely-numbered, USGS aluminum band was affixed to the right leg of each telemetered eagle. Standard measurements were taken of the adult; the foot span was measured to verify the sex of the adult and to determine the sex of the young eagle. (All trapping and handling of eagles was performed by NWC biologists with all of the federal and state permits governing these activities and with years of experience working with this species.)

Home range size and shape (year-round for the adult; natal area for the young) were estimated using fixed kernel estimators (Seaman and Powell, 1996). Results of this study are confidential in nature, are not included in this report, and are being shared with biologists with the USFWS and ODFW.

3.9 Big Game Observations

Where the Project overlaps ODFW-designated winter range for deer and elk, all big game species observed during the course of conducting avian use surveys were recorded. This includes observations occurring within the 800-meter avian use survey plots. All elk observations (including those outside designated winter range) were recorded. A general summary of big game observations is provided in this document (Section 4.9); details (numbers and locations) will be made available to agency personnel upon request, but are not reported here.

3.10 Special Status Vertebrate Wildlife Species Surveys

Methods for confirming the presence of special status vertebrate wildlife species during the breeding season were developed by NWC using the extensive background and experience of its staff, informal consultation with local ODFW biologists over a 20-year period, and suggested methods in the Oregon Methodology Manual (ODFW, 1994). NWC biologists and technicians walked meandering transects, concentrating on appropriate habitat structure and quality, approximately 50 meters to 70 meters (164 to 230 feet) apart. Surveys were conducted within all habitat suitable for target species within specific corridors at least 2,000 feet wide inside the Project boundary. Areas unsafe for walking, non-suitable habitat (dryland wheat areas), and residential areas were excluded from surveys. Rocky cliffs were surveyed and scanned from above and below, where appropriate.

Surveys were conducted from March through early June during diurnal periods of sunrise to early afternoon during time and weather conditions that were most suitable for detection of breeding birds and mammals. Surveys continued into the early afternoon, if needed, to survey for the potential of special status reptile species during a warmer period of the day. Aquatic habitats were not surveyed for aquatic species (fish and amphibians), because it is assumed these habitats will be avoided during Project facility design.

All vertebrate wildlife observed were recorded. Special status species locations were recorded with a handheld GPS receiver. Maps were generated in a GIS environment to assist in the micro-siting process.

Since there were no Federal Listed terrestrial vertebrate species with potential for occurrence on the Project, target species included Oregon State Listed or Sensitive Species and Federal Species of Concern that are believed to have potential for occurrence during the

breeding season based on range and habitat associations and NWC's local knowledge and experience. Special status wildlife species that may occur in the Wheatridge area include Swainson's hawk, ferruginous hawk, long-billed curlew, burrowing owl, peregrine falcon, loggerhead shrike, grasshopper sparrow, sagebrush sparrow, Washington ground squirrel, sagebrush lizard, western toad, white-tailed jackrabbit, and others (see complete list in Appendix C). Only the Washington ground squirrel is State Listed (Endangered status); the others are State Sensitive. Other species of general concern that may use the site for nesting (raptors) were surveyed from the air (see Raptor Nest Surveys, Section 2.6) or noted incidentally while conducting other ground-based surveys. Several bat species also have special ODFW status and some are federal Species of Concern; bat reviews and bat species investigation methods are addressed separately in Sections *2.1.5* and 2.12).

Because of the potential for occurrence on the Project of State Endangered Washington ground squirrels, these special status wildlife species surveys were conducted twice in suitable habitat, following ODFW protocols for detecting this species; these occurred between early March and early June. Supplemental surveys (for areas leased for potential development after spring 2011) were surveyed in spring 2012 and 2013.

3.11 Bat Species Investigation

NWC conducted a ground level, habitat-based bat species inventory. The primary goal of the study was to investigate bat species diversity within the Project boundary using acoustic monitoring equipment. The objectives were to: (1) field-collect baseline information on bat species presence during a specific seasonal period in specific areas and (2) examine spatial (landscape) and temporal (seasonal) bat species composition at various habitat areas within the Project boundary. Specifically, this inventory was expected to verify the occurrence on the Project of two species of concern—hoary bat and silver-haired bat—whose presence was expected from the results of the site evaluation (Tier 1) and site characterization (Tier 2) exercises (Section 2.4) and to determine whether other species of concern (such as Townsend's big-eared bat) were present.

Field investigations were conducted between the first week of July and the last week of October 2011. These dates represent the period of the year during which the majority of bat fatalities at turbines are known to occur in the Pacific Northwest and other regions (NWCC, 2010).

Six Pettersson D500x ultrasound detector/recorders capable of recording the echolocation calls of bats onto compact flash cards (CF cards) were housed in protective cases and located appropriately to blend in with the environment. Each of the six detectors was rotated between primary and alternate locations every other week to yield a total of 12 sampling sites throughout the seasonal period.

Downloaded calls were analyzed using SonoBat® 3.05 acoustic identification software to identify and delete unusable files (those containing only background/ambient/insect noise) and then identify bat species where possible. For recordings where species identification was unclear, the call was manually verified or rejected.

Calls were sorted by quality of recording. Calls without sufficient diagnostic characteristics were not analyzed further, and the remaining calls were compared with previously recorded calls from bats of known species at other sites (library files within SonoBat™ or personal NWC library of calls from Morrow, Umatilla, and Gilliam Counties). Interpretation of bat detector calls can sometimes result in error due to call overlap among some myotis species (e.g., California myotis and Yuma myotis) and among three other species (big brown, silver-

haired, and hoary bats). A conservative approach—one that used only complete calls that showed a consistent minimum frequency—were used for identifying bats to the species level. Calls not verifiable to species were grouped as either high frequency or low frequency.

4.0 FIELD STUDY RESULTS

4.1 Project and Study Components Agency Correspondence and Site Tours

The investigations components overview was submitted by representatives of Wheatridge Wind Energy, LLC to ODFW District Biologist Steve Cherry (of the Heppner, Oregon office) and to personnel at the La Grande, Oregon field office of the USFWS in early August 2012. These study components were discussed during a site tour held June 29, 2011. Agency personnel—including Steve Cherry (ODFW) and Suzanne Anderson and Gary Miller (USFWS)—took part in that site tour and commented on these study components. Another site tour was conducted on August 20, 2012, with Steve Cherry and Suzanne Anderson again present.

Results of golden eagle telemetry studies were shared with USFWS and ODFW on February 14, 2014, and general study results were shared with USFWS personnel in a meeting on March 25, 2014.

4.2 Wildlife Habitat and Deer/Elk Winter Range Mapping and Habitat Quality Rating

Habitat types and subtypes found within the assessed area (Figures 3a, b, and c and 4a, b, and c) are listed below by Category. Included are descriptions of the habitat types and subtypes and brief discussions of wildlife species typically associated with each. No Catgory 5 habitat was found within the assessed areas. Habitat Categories are defined in Section 3.2. Special status wildlife species and their scientific names can be found in Appendix C, and scientific names for common wildlife species can be found in Appendix G.

Category 1 Habitat

Washington ground squirrel sites are considered Category 1 habitat. In addition, all habitat suitable for this species within a 785-foot buffer of sites is also defined as Category 1 habitat. Examples of habitat breaks that would cause the 785-foot buffer to be truncated are tilled field edges or unvegetated, continuous vertical drop rim rock which has no burrowing or food value to Washington ground squirrels choosing to explore a given area. Small linear unvegetated inclusions into otherwise suitable habitat that were determined not to present a barrier to Washington ground squirrel use were not considered habitat breaks.

Washington ground squirrels were observed or sign of their use was confirmed in four habitat subtypes during Wheatridge wildlife surveys: these are Exotic Annual Grassland, Native Perennial Grassland, Basin Big Sagebrush Shrub-steppe, and Rabbitbrush/ Snakeweed Shrub-steppe. The process of survey, detection, and delineation was used to ensure that all Project facilities were subsequently sited to avoid Category 1 habitats. These habitats are described below, but none will be permanently or temporarily impacted by Project facilities.

Grassland

Washington ground squirrels were detected in two subtypes of Grassland within areas of survey, Exotic Annual (subtype GA) and Native Perennial (subtype GB). Grassland habitat was also present within 785 feet of WGS burrows.

Category 1 Exotic Annual Grassland is similar in vegetative cover and ecological condition to the immediately adjacent Category 4 Exotic Annual Grassland. Category 1 Exotic Annual Grasslands are categorized as Category 1 where they are within 785 feet of documented Washington ground squirrel burrows. White-tailed jackrabbit and burrowing owl may use this habitat, and horned lark commonly occurs in it.

Category 1 Native Perennial Grassland is similar in vegetative cover and ecological condition to the immediately adjacent Category 3 or Category 4 Native Perennial Grassland. Native Perennial Grasslands are categorized as Category 1 where they are within 785 feet of documented Washington ground squirrel burrows. Category 1 Native Perennial Grasslands provide essential foraging habitat to a variety of common resident and migratory birds and common mammals. Grasshopper sparrow, savannah sparrow, vesper sparrow, and white-tailed jackrabbit use this habitat, and horned lark and western meadowlark and horned lark occur commonly here. Native grasses and forbs provide forage for mule deer during all seasons of the year.

Shrub-steppe

Washington ground squirrels were detected in two subtypes of Shrub-steppe within the Project boundary, Basin Big Sagebrush Shrub-steppe (subtype SSA) and Rabbitbrush/Snakeweed Shrub-steppe (subtype SSB). Shrub-steppe habitat was also present within 785 feet of Washington ground squirrel burrows.

Category 1 Basin Big Sagebrush Shrub-steppe is similar in vegetative cover and ecological condition to the immediately adjacent Category 2 and 3 Basin Big Sagebrush Shrub-steppe. Basin Big Sagebrush Shrub-steppe is categorized as Category 1 where it is within 785 feet of documented Washington ground squirrel burrows. In addition to providing essential habitat for Washington ground squirrels, Category 1 Basin Big Sagebrush Shrub-steppe offers high quality breeding habitat for shrub obligate species including loggerhead shrike, and may support white-tailed jackrabbit. Brewer's sparrow and lark sparrow are present in larger blocks of this habitat. Sagebrush lizard and other reptiles are likely to be found in areas where sandy soils are present. Species commonly occurring during the breeding season as well as at other seasons include western meadowlark and mourning dove. This habitat provides year-round cover for mule deer.

Category 1 Rabbitbrush/Snakeweed Shrub-steppe is similar in vegetative cover and ecological condition to the immediately adjacent Category 3 or Category 4 Rabbitbrush/Snakeweed Shrub-steppe. Rabbitbrush/Snakeweed Shrub-steppe is categorized as Category 1 where it is within 785 feet of documented Washington ground squirrel burrows. In addition to providing essential habitat for Washington ground squirrels, Category 1 Rabbitbrush/Snakeweed Shrub-steppe provides foraging, cover, and/or nesting habitat for common birds and mammals, and may support white-tailed jackrabbit.

Category 2 Habitat

Two habitat types were identified as Category 2 within the wildlife survey areas at Wheatridge; these are Escarpment and Basin Big Sagebrush Shrub-steppe.

Exposed Rock

Category 2 Exposed Rock provides important habitat for a variety of vertebrates, including birds, mammals (including bats), and reptiles. There is one Category 2 subtype of Exposed Rock, Escarpment (subtype ESC), within wildlife survey areas associated with the Project.

Category 2 Escarpment consists of linear basalt outcroppings on the shoulders of steeper canyons or on the edges of canyons. Soils are absent or very shallow, and what vegetative cover is present consists of Sandberg's bluegrass, non-native grasses, and various native and non-native forbs. This habitat provides critical nesting substrate and perching sites for raptors and passerines, and roosting crevices for bats. Escarpment provides shade, escape cover and thermal cover for mule deer. It also provides home sites for woodrats and marmots and for several snake species, and all of these in turn represent important prey for a variety of raptors.

Although Escarpment was found in portions of the areas surveyed for wildlife, none of this habitat type is present within the Site Boundary in quantities large enough to be mapped, and so no permanent or temporary impacts will occur.

Shrub-steppe

Shrub-steppe is classified as Category 2 where it provides essential habitat to special status species such as loggerhead shrike. There is a single subtype of Category 2 Shrub-steppe, Basin Big Sagebrush Shrub-steppe (subtype SSA).

The Category 2 Basin Big Sagebrush Shrub-steppe consists of an overstory of mature (large structure) patches of basin big sagebrush. Understory plants consist of a mix of native bunchgrasses and exotic annual grasses depending largely on level of impact from disturbance. Common grasses are Sandberg bluegrass, bluebunch wheatgrass, cheatgrass, and bulbous bluegrass. Category 2 Basin Big Sagebrush Shrub-steppe has a higher shrub density and greater plant health than similar but lesser quality Category 3 Basin Big Sagebrush Shrub-steppe habitat. This habitat subtype is found on deep soils in portions of the Project, usually on slopes or in draws that prevent agricultural use. Category 2 Basin Big Sagebrush Shrub-steppe offers high quality breeding habitat for shrub obligate species including loggerhead shrike, and may support Washington ground squirrel and white-tailed jackrabbit. Brewer's sparrow and lark sparrow are present in larger blocks of this habitat subtype. Sagebrush lizard and other reptiles are likely to be found in areas where more sandy soils are present. Commonly occurring species include western meadowlark and mourning dove.

Category 3 Habitat

Three types of habitats were identified as Category 3 within the Project boundary: Developed, Grassland, and Shrub-steppe. Category 3 Shrub-steppe includes two subtypes, Basin Big Sagebrush Shrub-steppe and Rabbitbrush/Snakeweed Shrub-steppe.

Developed

Category 3 Developed habitats are areas where former disturbances have ceased and the disturbed areas have attained sufficient ecological condition to become important or essential for wildlife. Revegetated or Other Planted Grassland (subtype DR) is the only developed Category 3 subtype within wildlife survey areas associated with the Project.

Category 3 Revegetated or Other Planted Grasslands are planted grasslands on previously farmed or other disturbed lands that may be enrolled in the Conservation Reserve Program. This habitat subtype is comprised mainly of native or native-like grasses. Native vegetation in Category 3 Revegetated or Other Planted Grasslands may be sparse and not well-developed, and may have a significant component of annual grasses and weeds. This habitat supports special status species such as grasshopper sparrow and white-tailed jackrabbit and common species such as savannah sparrow and western meadowlark. During the years of wildlife surveys at Wheatridge, montane vole was present at extremely high densities; this resulted in concentrations of breeding

raptors (northern harrier and short-eared owl) and wintering raptors (northern harrier, red-tailed hawk, rough-legged hawk, short-eared owl, and golden eagle).

Grassland

Category 3 Grasslands provide essential or important foraging and nesting habitat for special status birds and mammals as well as for common native and non-native avian species. There was a single Category 3 grassland habitat subtype, Native Perennial Grassland (subtype GB), found within Wheatridge wildlife survey areas.

Category 3 Native Perennial Grasslands are dominated by native perennial grasses such as Sandberg bluegrass, bluebunch wheatgrass, Idaho fescue, western needlegrass, and needle-and-thread grass. Various native forbs and low shrubs such as gray rabbitbrush and, to a lesser extent, green rabbitbrush are present but are an inconspicuous component. Native vascular plants are diverse and a variety of invertebrates can be found utilizing the plants throughout the growing season. These habitats have been altered through land use or wildfires, and generally contain a significant component of non-native vegetation (broad-leaf weeds and annual grasses). Category 3 Native Perennial Grasslands generally occur on sites with shallow soils and harsh exposures, or in areas that have experienced livestock grazing or frequent fires. Category 3 Native Perennial Grassland is more abundant than Category 4 Native Perennial Grassland (described below). Native Perennial Grasslands provide essential foraging habitat to a variety of common resident and migratory birds and common mammals. Savannah sparrow, grasshopper sparrow, vesper sparrow, and white-tailed jackrabbit, and burrowing owl use this habitat, and horned lark and western meadowlark occur commonly. Native grasses and forbs provide forage for mule deer.

Shrub-steppe

The primary difference in the Category 2 and Category 3 Shrub-steppe habitats is the overall functionality of the habitat and the breeding season value for special status vertebrate wildlife species such as loggerhead shrike and Washington ground squirrel. In general, Category 3 tends to be more weedy, less biologically diverse, has obvious signs of prior or ongoing impacts, often including wildfire, and is a habitat type relatively common in the general area. The cryptogamic layer (the protective soil surface biotic crust of mosses, lichens, algae, and bacteria) has been impacted from land use, resulting in opportunities for non-native weedy plants to become established.

Category 3 shrub-steppe habitat is important to wildlife species but is not as limited in the region as Category 2 shrub-steppe. Two habitat subtypes are present in this category, Basin Big Sagebrush Shrub-steppe (subtype SSA) and Rabbitbrush/ Snakeweed Shrub-steppe (subtype SSB).

Category 3 Basin Big Sagebrush Shrub-steppe consists of basin big sagebrush at a mature stage (large structure). Patches of Category 3 Basin Big Sagebrush Shrub-steppe lack the density and plant health of Category 2 Basin Big Sagebrush Shrub-steppe or are in patches of limited size. The overstory sagebrush in this type is often decadent or lacks full foliage. Understory vegetation in Category 3 Basin Big Sagebrush Shrub-steppe often tends toward annual grasses and low weeds. These areas were historically higher quality habitats but are experiencing degradation due to land use practices or frequent fires. However, the mature shrub cover provides escape and resting cover for common wildlife and is limited in the immediate area and the region. Basin Big Sagebrush Shrub-steppe offers high quality breeding habitat for shrub obligate species including loggerhead shrike, and may support Washington ground squirrel and white-tailed jackrabbit. Brewer's sparrow and lark sparrow are present in larger blocks

of this habitat subtype. Sagebrush lizard and other reptiles are likely to be found in areas where more sandy soils are present. Commonly occurring species include western meadowlark and mourning dove.

Category 3 Rabbitbrush/Snakeweed Shrub-steppe is by far the most abundant Shrub-steppe subtype within wildlife survey areas associated with Wheatridge. Category 3 Rabbitbrush/Snakeweed Shrub-steppe areas have been affected by recent fires and are in a relatively early seral stage. Native rabbitbrush and other low-stature plants such as broom snakeweed and various buckwheat species are common. The understory is native Sandberg bluegrass, non-native cheatgrass, bulbous bluegrass, and tumblemustard. Patches of native perennial grasses, such as bluebunch wheatgrass and needle-and-thread grass, are present. Many of these sites contain small patches of sagebrush that are less than one acre (0.4 ha) in size. Category 3 Rabbitbrush/Snakeweed Shrub-steppe provides foraging, cover, and/or nesting habitat for grasshopper sparrows and white-tailed jackrabbit, as well as for common species such as horned lark and western meadowlark.

Category 4 Habitat

There are three subtypes of Category 4 habitat within wildlife survey areas associated with the Wheatridge Project; these are Exotic Annual Grassland, Native Perennial Grassland, and Rabbitbrush/Snakeweed Shrub-steppe.

Grassland

There are two subtypes of Category 4 grassland in the wildlife survey areas associated with the Project; these are Exotic Annual Grassland (subtype GA) and Native Perennial Grassland (subtype GB).

Category 4 Exotic Annual Grassland found within the wildlife survey areas associated with the Project are non-native grasslands with a very high weed component and disturbed or less nutrient-rich soils. The forb component is composed primarily of non-native weeds, such as cheatgrass, bulbous bluegrass, cereal rye, tumblemustard, and Russian thistle, with occasional patches of native bunchgrass, primarily Sandberg bluegrass. The high weed content is primarily due to past fires, which burned native shrubs and bunchgrasses and were followed by heavy grazing and/or wind erosion. Some of these sites support long-billed curlew. Category 4 Exotic Annual Grassland provides important habitat to common species like horned lark, but the dense weed cover and lack of native grasses limit the ability of most wildlife species to use these areas for forage or cover. In addition, the weed cover, often dominated by annuals such as cheatgrass, makes the slopes in this area more susceptible to erosion and soil damage from grazing, because of a lack of the robust root structure found in perennial species, such as the native bunchgrasses. With sufficient time and appropriate livestock grazing practices, however, these areas could become suitable habitat for some native wildlife species. This habitat is commonly found throughout the Columbia Basin.

Category 4 Native Perennial Grassland occurs in small patches within the wildlife survey areas associated with the Project. Category 4 Native Perennial Grassland is ecologically similar to Category 3 Native Perennial Grassland but is classified as Category 4 because its small size and isolated nature limit its value to wildlife. Native Perennial Grasslands provide important foraging habitat to a variety of common resident and migratory birds and common mammals. Savannah sparrow, grasshopper sparrow, vesper sparrow, burrowing owl, and white-tailed jackrabbit use, and horned lark and western meadowlark occur commonly in this habitat. Native grasses and forbs provide forage for mule deer.

Shrub-steppe

There is one subtype of Category 4 Shrub-steppe—Rabbitbrush/Snakeweed Shrub-steppe—within the wildlife survey areas associated with the Project.

Category 4 Rabbitbrush/Snakeweed Shrub-steppe habitat is important to wildlife. Category 4 Rabbitbrush/Snakeweed Shrub-steppe has the same plant species, but differs in composition from Category 3 Rabbitbrush/Snakeweed Shrub-steppe. Category 4 Rabbitbrush/Snakeweed Shrub-steppe has a greater weed and annual grass component than Category 3 Rabbitbrush/Snakeweed Shrub-steppe. While aspect and soils may contribute somewhat to this, disturbances such as livestock grazing and fires likely have a far greater effect. Category 4 Rabbitbrush/ Snakeweed Shrub-steppe provides foraging and/or nesting habitat for white-tailed jackrabbit as well as for the common species such as horned lark and western meadowlark.

Category 6 Habitat

Category 6 habitat is nonessential wildlife habitat with limited potential to become important or essential in the foreseeable future. There is one type of Category 6 habitat—Developed—within the wildlife survey areas associated with the Project.

Developed

There are three subtypes of Developed habitat within the wildlife survey areas associated with the Project; these are Irrigated Agriculture (subtype DI), Dryland Wheat (subtype DW), and Other (subtype DX).

Category 6 Irrigated Agriculture (DI) habitat consists of agricultural crop or pasture fields that are irrigated for all or a portion of the growing season. These areas were recognized by presence of irrigated farm crops and on-site irrigation implements such as pipes, sprinklers, pumps, and motors.

Category 6 Dryland Wheat (DW) habitat is the largest habitat subtype within the wildlife survey areas associated with the Project and is extensive throughout the region. It consists of agricultural fields that are currently in small grain production or fallow. Horned larks and mourning doves are common in winter stubble or when fallow. Wintering and migrating rough-legged hawks occasionally hunt for prey in wheat stubble fields, as do breeding Swainson's hawks in summer.

Category 6 Other (DX) habitat includes farming/ranching home and shop sites, corrals, structures, feedlots, active and inactive gravel quarries, non-irrigated pastures, graveled and paved roads, right-of-ways, and waste areas associated with on-going human activities. Although some areas have deciduous tree landscaping that attracts some native and non-native passerines, these sites and the other DX areas are not considered to have significant value to wildlife species. Because of the high level of disturbance, no special status/sensitive species are known or expected to occur with regularity in the Category 6 habitats, and these areas have low potential to become essential or important wildlife habitat in the foreseeable future.

4.3 Rare Plant Surveys

Special status plant surveys were conducted from May 11–June 13, 2011, with subsequent visits on June 28, 2011 and July 25, 2011 to accurately identify the mature fruit (pods) of one of the rare plant species detected (*Astragalus collinus var. laurentii*). Supplemental surveys were conducted in 2012 and 2013 along with special status wildlife species surveys

(in areas added after the 2011 surveys, including the transmission Intraconnection Corridor).

Three species of rare plants were found during surveys. Two of these were species tracked by ORBIC but without special state or federal status. The other was a State Threatened variety.

4.3.1 Wheatridge West

Within the survey area associated with the Wheatridge West portion of the Project, three populations of *Astragalus succumbens* (Columbia milkvetch) were found (Figure 5a). This species is considered by ORBIC to be a List 4 species, a "Taxon of Concern." In addition, one population of the State Threatened variety *Astragalus collinus* var. *laurentii* (Laurent's milkvetch) was found (Figure 5a).

4.3.2 Wheatridge East

Within the survey area associated with the Wheatridge East portion of the Project, a single small population of *Astragalus sclerocarpus* (Woodypod milkvetch) was found (Figure 5b). This species is considered by ORBIC to be a List 3 species, one that is "rare or uncommon but not imperiled." In addition, a single population of the State Threatened variety *Astragalus collinus* var. *laurentii* was found (Figure 5b).

4.3.3 Transmission Intraconnection Corridor

Two populations of the State Threatened variety *Astragalus collinus* var. *laurentii* were found within survey corridors associated with the transmission interconnect corridor (Figure 5c).

4.4 Avian Use Surveys

4.4.1 Wheatridge West

Fifty-four avian species were recorded within 800 m of plot centers (Table 3a). Fifteen species of raptor were recorded, including five species of concern—bald eagle, Swainson's hawk, ferruginous hawk, golden eagle, and burrowing owl. Other species of concern recorded were greater Sandhill crane, long-billed curlew, loggerhead shrike, and grasshopper sparrow. A comprehensive list of all avian species observed during surveys, along with their scientific names, can be found in Appendix G.

Avian Use

Avian use (mean number of individuals within 800 m/20-min point count) is a metric that provides an index of the numbers of birds using the Project area. Overall mean use across all seasons was dominated by passerines (Table 4a), with highest mean use values during winter season (11.381), followed by fall (9.543), and then spring season (9.210). The species of passerine with the highest use in all seasons was horned lark, with highest use in winter (9.880). Other species with high use in all seasons were western meadowlark, with a high in spring of 1.818, and common raven (highest in fall, 0.857).

Raptor mean use values were highest during winter season (2.726), when raptor use was comprised mainly of rough-legged hawk (1.341) and northern harrier (0.890). Fall season (2.411 overall raptor use) was dominated by red-tailed hawk (0.760) and northern harrier (0.754), with lesser use by Swainson's hawk (0.246) and rough-legged hawk (0.240). Raptor use was lowest in summer (1.566), when it was dominated by Swainson's hawk (0.659) followed by spring (1.926), when it was dominated by rough-legged hawk (0.790).

For golden eagle, mean use—low in all seasons—was highest in fall (0.074), followed by winter (0.037), summer (0.017), and spring (0.011; Table 4a).

Other notable mean use values were for greater Sandhill crane (0.739 in spring) and long-billed curlew (0.256 in spring; Table 4a).

Percent Composition

Percent composition (mean use for a species/total use across all species, multiplied by 100) provides an estimate of the use of a particular species relative to the use by all other species. This metric is particularly useful for identifying whether any one species or group has a dominant presence in the Project area. Passerines dominated over all other species groups throughout the year, with 78.83% of all detections in summer season, 76.37% in winter season, 75.81% in fall, and 73.78% in spring (Table 4a). Horned lark, in particular, was the passerine species that had the highest percentages in all seasons, with a high of 66.29% in winter season to a low of 48.61% in spring. Other passerine species that contributed more than 5% to overall composition percentages were western meadowlark (14.57% in spring season, 11.86% in summer, and 5.17% in fall) and common raven (6.81% in fall season and 6.36 in summer).

Percent composition of raptors varied from a high of 19.16% of all detections in fall season to a low of 15.43% in spring season (Table 4a). The raptor species with the highest percentage of the overall composition was rough-legged hawk (9.00% in winter season and 6.33% in spring); this species does not nest in the area. Other raptor species that comprised more than 5% of the overall recorded composition were Swainson's hawk (7.64% in summer season), red-tailed hawk (6.04% in fall), and northern harrier (5.99% in fall and 5.97% in winter).

Greater Sandhill crane comprised 5.92% of overall composition during spring season. It should be noted that the large plot size undoubtedly biases this metric in favor of large species (like raptors, waterfowl, and cranes), since these species are easily detected at 800 meters whereas smaller species are not.

Frequency of Occurrence

Frequency of occurrence (percentage of 20-min point counts in which a species was detected) provides an index of how often a species occurs in the Project area. In combination with mean use, it allows one to understand the basis of mean-use values. For example, greater Sandhill crane had relatively high mean use and percent composition values during spring season. These high values resulted, however, from a small number of large flocks flying overhead, meaning that frequency of occurrence of this species was low (detections occurred on 2.27% of spring season surveys). To understand the risks to birds of proposed structures, it is important to understand both how many birds use the Project area (mean use) and how frequently they use it (frequency of occurrence).

Passerines were observed at high frequencies throughout the year, including spring (97.73% of surveys), winter (89.30%), fall (87.43%), and summer seasons (85.55%; Table 4a). Horned larks were frequently observed during all seasons, with the highest percentage in spring season (91.48%) and the lowest in summer (76.30%). Western meadowlark was observed on 72.16% of spring surveys, 42.20% of summer surveys, 28.00% of fall surveys, and 14.72% of winter surveys. Common raven was observed frequently in all seasons, with a high in spring season (35.80%) and a low in summer (21.97%). Savannah sparrow was detected on 9.83% of summer surveys and 9.66% of spring surveys; grasshopper sparrow was detected on 8.67% of summer surveys (Table 4a).

Raptors were observed most frequently in spring (83.52% of surveys), followed by winter (77.26%), summer (75.72%), and fall season (69.71%). Rough-legged hawk was observed on 61.54% of winter surveys and 36.93% of spring surveys (but was not observed during summer). Northern harrier was detected on 45.82% of winter surveys, 40.00% of fall surveys, 34.09% of spring surveys, and 21.39% of summer surveys. Swainson's hawk was observed on 42.77% of summer surveys, 28.41% of spring surveys, and 14.86% of fall surveys (but was not observed during summer). Red-tailed hawk was observed on 37.14% of fall surveys, 23.70% of summer surveys, 21.07% of winter surveys, and 10.80% of spring surveys. American kestrel was observed on 11.43% of fall surveys, 6.94% of summer surveys, and 5.02% of winter surveys.

Long-billed curlew was detected on 14.77% of spring surveys.

Spatial Use

For raptors and other avian species of concern, some differences in spatial use were detectable (Table 5a). Plots A, B, C, D, E, F, G, O, and P (the more northerly plots; Figure 6a) were predominantly in developed agricultural lands with relatively little topographic relief. Plots H, I, J, K, L, M, and N (the more southerly plots; Figure 6a) contained more grassland habitats (primarily Revegetated Grassland) and relatively greater topographic relief. For northern harrier, red-tailed hawk, golden eagle, and short-eared owl, greater numbers of detections occurred within the more southerly portion of the Project (Table 5a). For long-billed curlew, the opposite was true, with most detections on the flatter northerly plots (Table 5a). Swainson's hawk and rough-legged hawk were detected at all plots, and appeared equally likely to use the northern half of the Project despite its being relatively flat and developed.

The Project area does not appear to be associated with any raptor migration routes, as evidenced by the lack of directed fall flight paths, the relatively low number of raptor detections in the fall season (Table 4a), and the dearth of detections of the most migratory species (such as sharp-shinned hawk, Cooper's hawk, turkey vulture, and merlin).

4.4.2 Wheatridge East

Thirty-seven avian species were recorded within 800 m of plot centers (Table 3b). Ten species of raptor were recorded, including four species of concern—Swainson's hawk, ferruginous hawk, golden eagle, and peregrine falcon. Other species of concern recorded were greater Sandhill crane, long-billed curlew, loggerhead shrike, and grasshopper sparrow. A comprehensive list of all avian species observed during surveys, along with their scientific names, can be found in Appendix G.

Avian Use

Avian use (mean number of individuals within 800 m/20-min point count) is a metric that provides an index of the numbers of birds using the Project area. Overall mean use across all seasons was dominated by passerines (Table 4b), with highest mean use values during spring season (28.070), followed by winter (14.063), and then summer (12.580). The species of passerine with the highest use in all seasons was horned lark, with highest use in spring (14.767). Other species with high use were western meadowlark (5.988 in spring, 3.023 in summer, 0.861 in winter), European starling (4.209 in spring), cliff swallow (1.140 in spring), and common raven (0.686 in spring and 0.528 in winter).

Raptor mean use values were highest during spring season (0.907), when raptor use was comprised mainly of rough-legged hawk and northern harrier (0.233 each) and red-tailed

hawk (0.221). Winter season (0.660 overall raptor use) was dominated by rough-legged hawk (0.229) and northern harrier (0.215). Raptor use was lowest in fall (0.250), followed by summer (0.489). Golden eagle was detected once during spring, and otherwise only during winter season, when its mean use was 0.118 (Table 4b).

Other notable mean use values were for greater Sandhill crane (1.523 in fall) and long-billed curlew (1.427 in spring; Table 4b).

Percent Composition

Percent composition (mean use for a species/total use across all species, multiplied by 100) provides an estimate of the use of a particular species relative to the use by all other species. This metric is particularly useful for identifying whether any one species or group has a dominant presence in the Project area. Passerines dominated over all other species groups throughout the year, with 95.52% of all detections in winter season, 92.28% in spring, 91.11% in summer, and 80.30% in fall (Table 4b). Horned lark, in particular, was the passerine species that had the highest percentages in all seasons, with a high of 80.80% in winter season to a low of 48.55% in spring. Other passerine species that contributed more than 5% to overall composition percentages were western meadowlark (21.89% in summer season, 19.69% in spring, 5.85% in winter, and 5.08% in fall) and European starling (13.84% in spring; Table 4b).

Percent composition of raptors varied from a high of 4.48% of all detections in winter season to a low of 2.73% in fall (Table 4b). The raptor species with the highest percentage of the overall composition were rough-legged hawk (1.56% in winter), northern harrier (1.49% in fall and 1.46% in winter), and Swainson's hawk (1.32% in summer).

Greater Sandhill crane comprised 16.60% of overall composition during fall season.

Frequency of Occurrence

Frequency of occurrence (percentage of 20-min point counts in which a species was detected) provides an index of how often a species occurs in the Project area. In combination with mean use, it allows one to understand the basis of mean-use values. For example, greater Sandhill crane had relatively high mean use and percent composition values during fall season. These high values resulted, however, from a small number of large flocks flying overhead, meaning that frequency of occurrence of this species was low (detections occurred on 2.27% of fall season surveys). To understand the risks to birds of proposed structures, it is important to understand both how many birds use the Project area (mean use) and how frequently they use it (frequency of occurrence).

Passerines were observed at high frequencies throughout the year, including spring (100% of surveys), summer (97.73%), winter (86.81%), and fall seasons (85.23%; Table 4b). Horned larks were frequently observed during all seasons, with the highest percentage in spring season (96.51%) and the lowest in fall (75.00%). Western meadowlark was observed on 94.19% of spring surveys, 68.18% of summer surveys, 26.14% of fall surveys, and 22.22% of winter surveys. Common raven was observed frequently in all seasons, with a high in spring season (24.42%) and a low in fall (7.95%). Grasshopper sparrow was detected on 28.14% of summer surveys and 27.91% of spring surveys. Cliff swallow was observed on 12.79% of spring surveys, and European starling was observed on 8.14% of spring surveys (figure 4b).

Raptors were observed most frequently in spring (50.00% of surveys), followed by winter (43.75%), summer (37.50%), and fall season (20.45%). Rough-legged hawk was observed

on 15.28% of winter surveys and 12.79% of spring surveys. Northern harrier was detected frequently throughout the year, on 20.93% of spring surveys, 15.97% of winter surveys, 11.36% of fall surveys, and 6.82% of summer surveys. Swainson's hawk was observed on 13.64% of summer surveys. Red-tailed hawk was observed on 13.95% of spring surveys, 11.36% of summer surveys, and 5.68% of spring surveys. Golden eagle was observed on 9.03% of winter surveys, and ferruginous hawk was observed on 5.81% of spring surveys. Swainson's hawk was not observed in winter, and golden eagle and rough-legged hawk were not observed in summer or fall.

Long-billed curlew was detected on 36.05% of spring surveys and 14.77% of summer surveys.

Spatial Use

The Wheatridge East portion of the Project is less variable (than the Wheatridge West portion) in topography and habitat. As a result, there were few differences discernible in avian spatial use. A greater number of detections of ferruginous hawk at plot B (in spring; Table 5b, Figure 6b) likely reflects the proximity of that plot to a territory of this species (with no active—but several inactive—nests found in 2011; Figure 7b). Far more long-billed curlew detections occurred at plots C and E (and, to a lesser extent, plots F and H) than at other plots; this may indicate that these plots encompass better foraging habitat for this species, that breeding attempts were occurring in proximity to these plots at the time of the study, or a combination of these or other factors. Grasshopper sparrow was detected at all plots except plot E.

The Project area does not appear to be associated with any raptor migration routes, as evidenced by the lack of directed fall flight paths, the relatively low number of raptor detections in the fall season (Table 4b), and the dearth of detections of the most migratory species (such as sharp-shinned hawk, Cooper's hawk, turkey vulture, and merlin).

4.5 Raptor Nest Surveys

4.5.1 Wheatridge West

The aerial raptor nest survey of the Wheatridge West portion covered an area of approximately 129.3 square miles (Figure 7a). In all, 28 active raptor nests (and ten common raven nests) were found during this survey, including nests of the following species:

- Swainson's hawk – 20
- Ferruginous hawk – 4
- Red-tailed hawk – 2
- Great horned owl – 2

In addition, 19 inactive stick nests were located. Of these, four were large and likely built by ferruginous hawks.

Locations of all nests detected, both active and inactive, are shown in Figure 7a. Scientific names of all species are listed in Appendix G. Two northern harrier nests, one burrow deemed to be a burrowing owl den, and 13 short-eared owl nests are shown in Figure 7a; these were found not during aerial raptor nest surveys but during special status wildlife surveys.

Overall raptor nest density within the 129.3-mi^2 survey area was 0.22 nests per square mile (Swainson's hawk 0.16/mi^2, ferruginous hawk 0.03/mi^2, red-tailed hawk 0.02/mi^2, great

horned owl 0.02/mi^2). In general, nests of northern harrier, burrowing owl, short-eared owl, and American kestrel are difficult to find using the aerial survey method. For comparison with other sites, nest density of those species (northern harrier, burrowing owl, and short-eared owl) found during special status wildlife species surveys are not included in the total nest density or in Table 5. This nest density estimate also does not include common raven nests or inactive nests.

4.5.2 Wheatridge East

The aerial raptor nest survey of the Wheatridge East portion covered an area of approximately 59.9 square miles (Figure 7b). In all, four active raptor nests (and three common raven nests) were found during this survey, including nests of the following species:

- Swainson's hawk – 2
- Red-tailed hawk – 2

In addition, 28 inactive stick nests were located. Of these, 24 were large and likely built by ferruginous hawks. (Ferruginous hawks build multiple nests within a territory, and these can persist for many years. The inactive ferruginous nests identified here likely represent only two to four territories that have changed slightly over time, and two active nests of this species were found just outside the survey area.)

Locations of all nests detected, both active and inactive, are shown in Figure 7b. Scientific names of all species are listed in Appendix G. Two burrows being used by burrowing owls during the 2011 breeding season were assumed to be nest dens and are shown in Figure 7b; these were found not during aerial raptor nest surveys but during special status wildlife species surveys.

Overall raptor nest density within the 59.9-mi^2 survey area was 0.07 nests per square mile (Swainson's hawk 0.03/mi^2, red-tailed hawk 0.03/mi^2). In general, nests of northern harrier, burrowing owl, short-eared owl, and American kestrel are difficult to find using the aerial survey method. For comparison with other sites, nest density of those species (burrowing owl) found during special status wildlife species surveys are not included in the total nest density or in Table 5. This nest density estimate also does not include common raven or inactive nests.

4.5.3 Transmission Intraconnection Corridor

The aerial raptor nest survey area associated with the Intraconnection Corridor (longer option) comprised approximately 67.6 square miles (Figure 7c). In all, 16 active raptor nests (and five common raven nests) were found during surveys of this area, including nests of the following species:

- Swainson's hawk – 9
- Ferruginous hawk – 1
- Red-tailed hawk – 4
- Barn owl – 1
- Prairie falcon – 1

In addition, 53 inactive stick nests were located. Of these, one was built by golden eagles and 33 were large and likely built by ferruginous hawks. (Ferruginous hawks build multiple nests within a territory, and these can persist for many years. The inactive ferruginous nests identified here likely represent only two to four territories that have changed slightly over time, and two active nests of this species were found just outside the survey area.)

Locations of all nests detected, both active and inactive, are shown in Figure 7c. Scientific names of all species are listed in Appendix G. One short-eared owl nest and one burrow being used by burrowing owls during the breeding season (and assumed to be a nest den) are shown in Figure 7c; these were found not during aerial raptor nest surveys but during special status wildlife surveys.

Overall raptor nest density within the 67.6-mi^2 survey area was 0.24 nests per square mile (Swainson's hawk 0.13/mi^2, ferruginous hawk 0.01/mi^2, red-tailed hawk 0.06/mi^2, barn owl 0.01/mi^2, prairie falcon 0.01/mi^2). In general, nests of northern harrier, burrowing owl, short-eared owl, and American kestrel are difficult to find using the aerial survey method. For comparison with other sites, nest density of those species (short-eared owl and burrowing owl) found during special status wildlife species surveys are not included in the total nest density. This total nest density estimate also does not include common raven or inactive nests.

4.6 Eagle Nest Survey 2011

The single historical bald eagle nest located in Umatilla County in the ORBIC records was found to be no longer present.

Seven occupied and one unoccupied golden eagle territories were discovered and/or monitored within ten miles of the Project in 2011. Territory descriptions below use NWC nest numbers, which correspond to those on Figure 8 (submitted separately to agencies). Also included in the territory descriptions are the numbers used by the Oregon Eagle Foundation (OEF) to designate those territories of which they had prior knowledge.

A territory (OEF H0160) on the Boardman Conservation Area that in 2007 and 2008 was occupied by a pair of golden eagles was monitored in 2011 by TNC. The territory was apparently unoccupied; signs of nest #3749 remained, but nest #3750 was no longer present (L. Nelson, pers. comm., 2011). This territory is within ten miles of Wheatridge West but greater than ten miles from Wheatridge East and the Intraconnection Corridor.

Another historically-known territory (OEF H0064) was occupied by a pair of golden eagles in 2011, but no breeding attempt was documented. A single cliff nest, #3344, was identified in this territory. This territory is within ten miles of Wheatridge West, Wheatridge East, and the Intraconnection Corridor.

Nests #3042 and #3345 were identified in 2011 on a single small cliff. Nest #3042 was used by golden eagles that season, and the breeding attempt resulted in two fledged young. In the week before fledging, each of these was banded, and a PTT was deployed on one of them (see Section 4.8). This territory is within ten miles of Wheatridge East and the Intraconnection Corridor but greater than ten miles from Wheatridge West.

Nest #3351 was discovered in 2011 in a lone cottonwood. The breeding attempt resulted in the successful fledging of two young. This territory is within ten miles of the Intraconnection Corridor but greater than ten miles from Wheatridge West and Wheatridge East.

Nest #3352 was discovered in 2011 in a cottonwood. The breeding attempt resulted in the successful fledging of two young. This territory is within ten miles of the Intraconnection Corridor but greater than ten miles from Wheatridge West and Wheatridge East.

In a historically-known territory (OEF H0065), nest #3040, in a lone cottonwood, was active in 2011. This breeding attempt failed, however, when the nest and the branch supporting it fell in a spring windstorm. An inactive nest (#3493) in another cottonwood was also identified within this territory; it was (according to the landowner) used by golden eagles up until approximately ten years ago. This territory is within ten miles of the Intraconnection Corridor, partially within ten miles of Wheatridge East, and greater than ten miles from Wheatridge West.

Nest #3477 was identified in 2011 in a locust tree in a historically-known territory (OEF H0066). The territory was occupied by a pair of golden eagles, but if a breeding attempt occurred that year it had failed prior to NWC's discovery of the nest. This territory is within ten miles of Wheatridge West and the Intraconnection Corridor but greater than ten miles from Wheatridge East.

Nest #3350 was identified in a grove of cottonwoods in 2011; a breeding attempt that year resulted in the fledging of one young. This territory is within ten miles of Wheatridge West but greater than ten miles from Wheatridge East and the Intraconnection Corridor.

In summary, the 2011 eagle nest survey of the Project area and an area within ten miles of the Project boundary yielded seven occupied golden eagle territories, five active nests, four successful breeding attempts, and seven fledged young. Nests at occupied territories were at distances from the nearest proposed turbines of 6.4 km (4.0 mi), 7.5 km (4.7 mi), 11.3 km (7.0 mi), 13.0 km (8.1 mi), 16.6 km (10.3 mi), 17.4 km (10.6 mi), and 17.6 km (10.9 mi).

4.7 Eagle Nest Monitoring

4.7.1 2012 Golden Eagle Nest Monitoring

TNC personnel again monitored the historical territory (OEF H0160) on the Boardman Conservation Area. No sign of occupancy was detected, though evidence of the old nest #3749 still remained (L. Nelson, pers. comm., 2012).

At OEF territory H0064 in 2012, a full adult female was observed apparently soliciting copulation in nest #3344, but the attending male was a subadult whose behavior was not that of a potential breeder. Thus, the territory was again occupied, but no active nesting was documented.

Nest #3042 was active in 2012, but the breeding attempt resulted in failure before hatching occurred.

In 2012, nest #3351 was no longer present (though the lone cottonwood in which it had been was still standing), and survey of the vicinity yielded no other eagle nests; a pair of golden eagles was observed upon occasion within this territory in 2012.

In 2012, nest #3352 was no longer present (though the cottonwood in which it had been was still standing), and survey of the vicinity yielded no other eagle nests.

Nest #4035 was newly built on a small rimrock in winter of 2011-2012 and was used for breeding in 2012. Though two young were observed in this nest in early May, only one of these survived to fledging.

The 2012 breeding attempt at nest #3477 resulted in the fledging of two young.

Nest #3350 was used in 2012, but that breeding attempt failed.

In summary, the 2012 eagle nest monitoring of the Project area and an area within ten miles of the Project boundary yielded six occupied golden eagle territories, four active nests, two successful breeding attempts, and three fledged young. The absence in 2012 of two tree nests active in 2011 underscores the ephemeral nature—in windy country—of such tree nests and the dearth of classic nesting substrate (large cliffs).

4.7.2 2013 Golden Eagle Nest Monitoring

TNC personnel again monitored the historical territory (OEF H0160) on the Boardman Conservation Area. No sign of occupancy was detected, though evidence of the old nest #3749 still remained (L. Nelson, pers. comm., 2013). It seems clear that this area served as a golden eagle territory only briefly—during two years of very high Washington ground squirrel density. It does not contain the nesting substrate normally used by golden eagles in this ecoregion and does not normally contain a sufficient prey base to provide long-term integrity as a golden eagle breeding territory.

At OEF territory C0064 in 2013, an adult golden eagle was observed carrying sticks to and building a new nest in a rock outcrop west of Little Butter Creek. Subsequent monitoring found no evidence that egg-laying or incubation ever occurred at this new nest (NWC #4138), which remained unfinished. Thus, the territory was again occupied, but no active nesting was documented.

Nest #3042 was active in 2013, but the breeding attempt resulted in failure, either before hatching occurred or early in the brooding period.

In 2013, nest #3351 (from 2011) was still no longer present (though the lone cottonwood in which it had been was still standing), and survey of the vicinity yielded no other eagle nests.

In 2013, nest #3352 (from 2011) was still no longer present (though the cottonwood in which it had been was still standing), and survey of the vicinity yielded no other eagle nests.

Nest #4327 was newly built in a cottonwood in the spring of 2013, but there was no evidence of egg-laying or incubating. The other two nests in this territory were inactive. Two adults were observed in this territory, but no breeding attempt was detected.

The 2013 breeding attempt at nest #3477 resulted in the fledging of one young.

No evidence of a breeding attempt was documented at nest #3350 in 2013.

In summary, the 2013 eagle nest monitoring of the Project area and an area within ten miles of the Project boundary yielded four occupied golden eagle territories, two active nests, one successful breeding attempt, and one fledged young.

4.7.3 2014 Golden Eagle Nest Monitoring

In 2014, there was again no evidence of occupancy of historical territory OEF H0160 on the Boardman Conservation Area. Though the old nest #3749 still remained, there was no sign of its having been used or refurbished in recent years.

None of the nests within OEF territory H0064 were used and no golden eagles were documented in 2014.

Nest #3042 was active in 2014, and this breeding attempt resulted in the fledging of one young eaglet.

In 2014, nest #3351 was no longer present. A pair of golden eagles was observed regularly (by the landowner; K. Hughes, pers. comm., 2014) within this territory in 2014, two empty nests that might have been built by golden eagles were found between this territory and the one to the west of it. It is possible that a breeding attempt was missed, but if a successful breeding attempt occurred, then fledging would have had to have been earlier than that of the other three active nests monitored in 2014.

In 2014, nest #3352 was no longer present (though the cottonwood in which it had been was still standing), and survey of the vicinity yielded no other eagle nests.

Nests #3493, #4035, and #4327 were inactive in 2014, and this territory appeared to be occupied by just a single adult golden eagle.

The 2014 breeding attempt at nest #3477 resulted in the fledging of one young.

There was a 2014 breeding attempt in a new nest in the same cottonwood grove as nest #3350. The attempt resulted in the fledging of at least one young. The nest was monitored during incubation and again when this nestling was approximately nine weeks old. If there had been an older young that had already fledged, it would have been difficult to find in the grove of cottonwoods in which this pair of eagles breeds.

In summary, the 2014 eagle nest monitoring of the Project area and an area within ten miles of the Project boundary yielded five occupied golden eagle territories, three active nests, three successful breeding attempts, and three fledged young. Two new potential golden eagle nests were discovered late in the breeding season west of one known territory; these will be monitored in subsequent monitoring years.

4.8 Golden Eagle Telemetry Studies

A PTT was deployed on June 15, 2011 on the older of two young (both of which were males) produced at the active nest (#3042) nearest the Project. This bird was banded at that time, and a blood sample was collected. Analysis showed no lead in the blood.

The telemetered juvenile survived his first winter (achieved independence and learned to hunt for himself), and gradually moved from the natal area. He was tracked for approximately 16 months, until the time of his death by shooting. (This eagle's carcass was immediately turned over to the nearest ODFW office, from which it was subsequently picked up by an investigator with the USFWS Office of Law Enforcement.) Telemetry locations and estimated natal home range areas were mapped and, together with further details of the methods and results of this research (Gerhardt, 2013a), were submitted to Wheatridge on January 10, 2013 and subsequently (on February 14, 2014) to USFWS and ODFW personnel.

The resident male at this same nest was captured on January 5, 2012; he was banded and a PTT was successfully deployed on him. He was not a full adult at the time of capture, but had nonetheless successfully raised two young during the previous breeding season. As of August 2014, this bird remains healthy and within his territory, and the PTT continues to

transmit his locations. Annual reports of this study, including calculations and maps of estimated home range areas, were submitted to Wheatridge on January 11, 2013 (Gerhardt, 2013b) and January 30, 2014 (Gerhardt and Anderson, 2014) and subsequently (on February 14, 2014) to USFWS and ODFW personnel.

4.9 Big Game Observations

At Wheatridge West, pronghorn were observed on nine occasions, in all seasons except summer; observations were of as few as a single individual and as many as 25 animals. White-tailed deer were observed on two occasions (June 20 and September 2, 2011); both observations were of single individuals. Mule deer were observed throughout the year, with observations being of as few as a single individual and as many as 100 animals. On a single occasion (during supplemental special status wildlife surveys during spring 2012) three elk were observed at Wheatridge West.

At Wheatridge East, pronghorn were observed on 15 occasions in spring and summer (between March 7 and July 23, 2011); number observed varied from a single individual to as many as five. Mule deer were observed throughout the year (though less frequently during fall), with observations being of as few as a single individual and as many as 45 animals. No elk were observed at Wheatridge East.

4.10 Special Status Vertebrate Wildlife Species Surveys

4.10.1 Wheatridge West

Two mammalian species and their sign were detected during special status vertebrate wildlife species surveys; these were Washington ground squirrel and white-tailed jackrabbit. Number and distribution of detections of each of these species is discussed below. Figure 9a displays Category 1 habitat designated based on all detections of Washington ground squirrel (visual or auditory observations of squirrels or confirmed active burrows); all detections of white-tailed jackrabbit and their sign (pellets) are displayed on Figure 11a. Three avian special status species were detected during special status wildlife species surveys; these were long-billed curlew, loggerhead shrike, and grasshopper sparrow. Number and distribution of each of these species is discussed below; burrowing owl dens are displayed on Figure 4a, and detections of all other special status vertebrate species are displayed on Figure 11a.

Raptor nests—including those (two of northern harrier, one of burrowing owl, and 13 of short-eared owl) found during special status vertebrate wildlife species surveys—are addressed in Section *4.5.1* (Raptor Nest Surveys) and displayed on Figure 7a. Use of the Project by special status raptor species is addressed in Section *4.4.1* (Avian Use Surveys), and detections of such species during special status vertebrate wildlife species surveys are not included here.

Washington ground squirrel: There were 50 recorded detections of Washington ground squirrel within special status vertebrate wildlife species survey corridors (Figure 9a, submitted separately). These ranged from single holes with scat present to larger areas of use at which adult and/or juvenile ground squirrels were both seen and heard. Washington ground squirrels were detected in three habitat types, Exotic Annual Grassland, Native Perennial Grassland, and Rabbitbrush/Snakeweed Shrub-steppe. This species was found in numerous soil types, with the greatest number of detections in Ritzville silt loam, Willis silt loam, and Mikkalo silt loam (Figure 10a).

White-tailed jackrabbit: A single detection of two white-tailed jackrabbits was recorded; this was in Basin Big Sagebrush Shrub-steppe. In addition, jackrabbit pellets were recorded at

ten locations (Figure 11a); these were in Native Perennial Grassland, Revegetated Grassland, Exotic Annual Grassland, and Basin Big Sagebrush Shrub-steppe habitats. Sign of this species was concentrated in the northern portion of Wheatridge West (Figure 11a).

Long-billed curlew: There were 19 detections of long-billed curlew (Figure 11a); these were of pairs or of individuals exhibiting territorial behaviors. Detections occurred in five habitat types, Revegetated Grassland, Exotic Annual Grassland, Native Perennial Grassland, Basin Big Sagebrush Shrub-steppe, and Rabbitbrush/Snakeweed Shrub-steppe. Most detections of this species were in gentle terrain in the central portion of Wheatridge West (Figure 11a).

Loggerhead shrike: There were five detections of loggerhead shrike (Figure 11a). Although this species is normally associated with Basin Big Sagebrush Shrub-steppe, these detections occurred instead in Rabbitbrush/Snakeweed Shrub-steppe, Native Perennial Grassland, and Exotic Annual Grassland. Four of the five detections of this species were in the north-central portion of Wheatridge West (Figure 11a).

Grasshopper sparrow: Detections of grasshopper sparrow numbered 321, and occurred throughout the Project survey corridors (Figure 11a). Most detections were of singing territorial males, but some were of likely females, of pairs together, or of nests. Grasshopper sparrows were detected most numerously in Native Perennial Grassland, Revegetated Grassland, and Exotic Annual Grassland, but detections also occurred in Basin Big Sagebrush Shrub-steppe and Rabbitbrush/Snakeweed Shrub-steppe. Though designated a State Sensitive-Vulnerable species due to conversion of native grassland habitat to agriculture and other development, grasshopper sparrow is easily one of the most numerous avian species on the Project and within the Columbia Plateau during the seasons it is present.

4.10.2 Wheatridge East

Two mammalian species and their sign were detected during special status vertebrate wildlife species surveys; these were Washington ground squirrel and white-tailed jackrabbit. Number and distribution of detections of each of these species is discussed below. Figure 9b displays Category 1 habitat designated based on all detections of Washington ground squirrel (visual or auditory observations of squirrels or confirmed active burrows); all detections of white-tailed jackrabbit and their pellets are displayed on Figure 11b. Two avian special status species were detected during special status wildlife species surveys; these were long-billed curlew and grasshopper sparrow. Number and distribution of each of these species is discussed below, and all detections are displayed on Figure 11b.

Raptor nests—including those (two of burrowing owl) found during special status vertebrate wildlife species surveys—are addressed in Section *4.5.2* (Raptor Nest Surveys) and displayed on Figure 7b. Use of the Project by special status raptor species is addressed in Section *4.4.2* (Avian Use Surveys), and detections of such species during special status vertebrate wildlife species surveys are not included here.

Washington ground squirrel: There were 55 recorded detections of Washington ground squirrel within special status vertebrate wildlife species survey corridors (Figure 9b, submitted separately). These ranged from single holes with scat present to larger areas of usee at which ground squirrels were both seen and heard. Washington ground squirrels were detected in three habitat types, Exotic Annual Grassland, Native Perennial Grassland, and Basin Big Sagebrush Shrub-steppe. This species was found in numerous soil types, with the largest number of detections in Valby silt loam (Figure 10b).

White-tailed jackrabbit: There were six detections of individual white-tailed jackrabbits (Figure 11b); these were in Exotic Annual Grassland, Basin Big Sagebrush Shrub-steppe, and Native Perennial Grassland. In addition, jackrabbit pellets were recorded at four locations; these were in Native Perennial Grassland and Rabbitbrush/Snakeweed Shrub-steppe. Detections of jackrabbits and their pellets were broadly distributed throughout Wheatridge East (Figure 11b).

Long-billed curlew: There were 13 detections of long-billed curlew (Figure 11b); these were of pairs or of individuals exhibiting territorial behaviors. Detections occurred primarily in Exotic Annual Grassland and Native Perennial Grassland, but one detection was in Rabbitbrush/Snakeweed Shrub-steppe. Detections of this species were concentrated in the south-central portion of Wheatridge East (Figure 11b).

Grasshopper sparrow: Detections of grasshopper sparrow numbered 166, and occurred throughout the Project survey corridors (Figure 11b). Most detections were of singing territorial males, but some were of likely females, of pairs together, or of nests. Grasshopper sparrows were detected most numerously in Exotic Annual Grassland and Native Perennial Grassland, but detections also occurred in Basin Big Sagebrush Shrub-steppe and Rabbitbrush/Snakeweed Shrub-steppe. Though designated a State Sensitive-Vulnerable species due to conversion of native grassland habitat to agriculture and other development, grasshopper sparrow is easily one of the most numerous avian species on the Project and within grassland habitats of the Columbia Plateau during the seasons it is present.

4.10.3 Transmission Intraconnection Corridor

Two mammalian species and their sign were detected during special status vertebrate wildlife species surveys; these were Washington ground squirrel and white-tailed jackrabbit. Number and distribution of detections of each of these species is discussed below. Figure 9c displays Category 1 habitat designated based on all detections of Washington ground squirrel (visual or auditory observations of squirrels or confirmed active burrows); all detections of white-tailed jackrabbit and their pellets are displayed on Figure 11c. Two avian special status species were detected during special status wildlife species surveys; these were long-billed curlew and grasshopper sparrow. Number and distribution of each of these species is discussed below, and all detections are displayed on Figure 11c.

Washington ground squirrel: There were 19 recorded detections of Washington ground squirrel within special status vertebrate wildlife species survey corridors (Figure 10c, submitted separately). These ranged from single holes with scat present to larger areas of use at which ground squirrels were both seen and heard. Washington ground squirrels were detected primarily in Native Perennial Grassland, with two detections in Exotic Annual Grassland. Detections occurred in numerous soil types, most frequently in Lickskillet very stony loam and Valby silt loam (Figure 10c).

White-tailed jackrabbit: There were two detections of individual white-tailed jackrabbits, and jackrabbit pellets were recorded at ten locations (Figure 11c); detections were in Native Perennial Grassland, Basin Big Sagebrush Shrub-steppe, and Rabbitbrush/ Snakeweed Shrub-steppe.

Long-billed curlew: There were two detections of long-billed curlew (Figure 11c); these were of individuals exhibiting territorial behaviors. Detections were in Native Perennial Grassland in the Morris Canyon, Juniper Canyon, and Service Buttes portions of the Intraconnection Corridor (Figure 11c).

Grasshopper sparrow: Detections of grasshopper sparrow numbered 128, and occurred throughout the length of the survey corridors associated with the Intraconnection Corridor (Figure 11c). Most detections were of singing territorial males, but some were of likely females, of pairs together, or of nests. Grasshopper sparrows were detected most numerously in Native Perennial Grassland, Rabbitbrush/Snakeweed Shrub-steppe, and Revegetated Grassland, with a single detection in Exotic Annual Grassland. Though designated a State Sensitive-Vulnerable species due to conversion of native grassland habitat to agriculture and other development, grasshopper sparrow is easily one of the most numerous avian species on the Intraconnection Corridor and within grassland habitats of the Columbia Plateau during the seasons it is present.

4.11 Bat Species Investigation

Eight species of bat were detected at one or more of the 12 acoustic monitoring sites (Table 8). These included the two species of concern known to be at risk of collision with turbines, hoary bat and silver-haired bat. Other detected species of concern were California myotis, small-footed myotis, long-eared myotis, and long-legged myotis.

Silver-haired bat was detected at 11 of the 12 study locations and at each of the three Project portions. Small-footed myotis was detected at nine of the 12 acoustic monitoring sites and at each of the three portions of the Project. Hoary bat was found at six of the detector locations and at each of the three Project portions. Little brown bat and canyon bat were each found at four acoustic monitoring sites and at each of the three portions of the Project. California myotis, long-eared myotis, and long-legged myotis were each detected at a single site (7B), near a riparian area along the Intraconnection Corridor (Tables 7 and 8, Figure 12c).

4.11.1 Wheatridge West

Five species of bat were detected at one or more of the six acoustic monitoring sites at Wheatridge West (Tables 7 and 8, Figure 12a). Silver-haired bat was detected at all six locations. Small-footed myotis was detected at five of the six acoustic monitoring sites, and hoary bat was detected at four locations. Little brown bat and canyon bat were each detected at a single station (Table 8).

Three of these species have special status (Appendix D). Silver-haired bat (federal Species of Concern; State Sensitive-Vulnerable) and hoary bat (State Sensitive-Vulnerable) are each found with some frequency as fatalities at wind energy projects; small-footed myotis (federal Species of Concern) has not been found as a fatality at any wind energy projects in the Columbia Plateau and exhibits foraging and flight behaviors that tend to keep it below the height of rotors.

4.11.2 Wheatridge East

Five species of bat were detected at one or more of the four acoustic monitoring sites at Wheatridge East (Tables 7 and 8, Figure 12b). Silver-haired bat was detected at three of four detector locations, and small-footed myotis was detected at two of four acoustic monitoring sites. All five species (the other three being hoary bat, little brown bat, and canyon bat) were detected at site 5B, in native perennial grassland (Tables 7 and 8, Figure 12b).

Three of these species have special status (Appendix D). Silver-haired bat (federal Species of Concern; State Sensitive-Vulnerable) and hoary bat (State Sensitive-Vulnerable) are each found with some frequency as fatalities at wind energy projects; small-footed myotis (federal Species of Concern) has not been found as a fatality at any wind energy projects in

the Columbia Plateau and exhibits foraging and flight behaviors that tend to keep it below the height of rotors.

4.11.3 Transmission Intraconnection Corridor Pathway

Eight species of bat were detected at one or both of two acoustic monitoring sites along the Intraconnection Corridor (Tables 7 and 8, Figure 12c). Four species—silver-haired bat, small-footed myotis, little brown bat, and canyon bat—were detected at both sites; hoary bat, California myotis, long-eared myotis, and long-legged myotis were each detected at one site. All eight species were detected at acoustic monitoring site 7B, which was adjacent to a riparian area (Tables 7 and 8, Figure 12c).

Six of these species have special status (Appendix D). Silver-haired bat (federal Species of Concern; State Sensitive-Vulnerable) and hoary bat (State Sensitive-Vulnerable) are each found with some frequency as fatalities at wind energy projects. The other four—California myotis (State Sensitive-Vulnerable), small-footed myotis (federal Species of Concern), long-eared myotis (federal Species of Concern), and long-legged myotis (federal Species of Concern, State Sensitive-Vulnerable)—have not been found as fatalities at any wind energy projects in the Columbia Plateau and exhibit foraging and flight behaviors that tend to keep them below the height of rotors.

5.0 TIER 3 ADVERSE EFFECTS ASSESSMENT

Completion of field investigations resulted in the information necessary for answering the Tier 3 questions from the land-based wind energy guidelines (USFWS, 2012a), for identifying potential adverse effects to species identified as of concern, and for identifying ways to avoid, minimize, and mitigate for those potential effects. For each Project component—Wheatridge West, Wheatridge East, and the transmission Intraconnection Corridor—this section first quantifies the anticipated temporary and permanent habitat losses. It then uses the Tier 3 questions to identify and discuss the potential adverse effects to those wildlife and plant species identified as species of concern. This section includes descriptions of *avoidance*, *minimization*, and *mitigation* measures that have been or will be used to address potential adverse effects to species of concern. Potential adverse effects to other species—those not identified as species of concern—are discussed generally in Appendix H.

5.1 Wheatridge West

5.1.1 Wildlife Habitat Loss by Type and Category

Impacts to wildlife habitat include both temporary and permanent habitat loss. Habitat loss and various levels of habitat alteration and disturbance occur mainly during construction. Periodically during operations, additional temporary impacts may occur for facility repairs or upgrades. These will be restored as required in the Permit Conditions. Permanent impacts are those where Project facilities are located for the life of the Project or where complete restoration of temporarily impacted habitats may not be attainable. Mature sagebrush shrubs in Shrub-steppe habitat may not be restored to the pre-construction structural stage for an extensive time-period (20–30 years or more).

Table 2a delineates the acreages of habitat loss—temporary and permanent—expected under each of two layouts. The maximum acreages are those that would be impacted if the smaller turbines are chosen (as more of them would be required to attain the target generating capacity); the minimum acreages are those associated with the larger turbines.

No permanent or temporary habitat loss will occur in Category 1 habitats.

The maximum layout entails the permanent loss of 122.9 acres and the temporary loss of an additional 746.6 acres (Table 2a). The majority of this loss (67% of permanent loss and 65% of temporary loss) will be in Category 6 Dryland Wheat habitat. Category 3 habitats—Revegetated/Other Planted Grassland, Native Perennial Grassland, and Rabbitbrush/Snakeweed Shrub-steppe—comprise 29% of permanent and 31% of temporary loss, with the majority of this being Revegetated/Other Planted Grassland. Category 4 Exotic Annual Grassland comprises less than 3% of permanent and approximately 3% of temporary habitat loss, and Category 2 Basin Big Sagebrush Shrub-steppe comprises less than 1% of permanent and temporary habitat loss.

The minimum layout entails the permanent loss of 102.6 acres and the temporary loss of an additional 688.1 acres (Table 2a). The majority of this loss (66% of permanent loss and 63% of temporary loss) will be in Category 6 Dryland Wheat habitat. Category 3 habitats—Revegetated/Other Planted Grassland, Native Perennial Grassland, and Rabbitbrush/Snakeweed Shrub-steppe—comprise 31% of permanent and 33% of temporary loss, with the majority of this being Revegetated/Other Planted Grassland. Category 4 Exotic Annual Grassland comprises less than 3% of permanent and temporary habitat loss, and Category 2 Basin Big Sagebrush Shrub-steppe comprises less than 1% of permanent and temporary habitat loss.

Permanent loss of Category 2, Category 3, and Category 4 habitats will be mitigated for under the Project's Habitat Mitigation Plan. For that purpose, all impacts occurring within designated deer winter range (ODFW, 2013) are deemed to require the level of mitigation appropriate for Category 2 habitat (more than 1 acre of mitigation for every acre of permanent loss) without regard for habitat type and quality (except that Category 6 habitats are excluded from this delineation). Acreages of habitat impacts are also calculated under this scheme in Table 2a.

5.1.2 Answers to Tier 3 Questions

1) "Do field studies indicate that species of concern are present on or likely to use the proposed [Wheatridge West] site?"

Field studies indicated the presence of several species of concern. These were Washington ground squirrel, white-tailed jackrabbit, hoary bat, silver-haired bat, small-footed myotis, greater Sandhill crane, Swainson's hawk, ferruginous hawk, golden eagle, long-billed curlew, burrowing owl, loggerhead shrike, grasshopper sparrow, and Laurent's milkvetch. Mule deer, a common species with no special status but nonetheless of management concern to ODFW, was also present.

2) "Do field studies indicate the potential for significant adverse impacts on affected populations of species of habitat fragmentation concern?"

Washington ground squirrel: Habitat fragmentation has been identified as a potential concern for populations of this species. In the case of Wheatridge West, however, further habitat fragmentation is not expected to occur. As discussed below, Project facilities were microsited to avoid ground squirrel colonies and adjacent suitable habitat. Moreover, the facilities were wherever possible sited in disturbed habitat types that do not provide suitable habitat for this species. In addition, the facilities themselves (even were they placed within potential suitable habitat) are not deemed to constitute a barrier to dispersal by individuals of this species.

3) "What is the distribution, relative abundance, behavior, and site use of species of concern identified in Tiers 1 or 2, and to what extent do these factors expose these species to risk from the proposed [Wheatridge West] wind energy project?"

Washington ground squirrel: Washington ground squirrel (a federal Candidate Species and a State of Oregon Endangered Species) is narrowly distributed but somewhat abundant within its distribution at Wheatridge West (Sec. 4.10.1; Figure 9a). Avoidance measures (discussed above and below) will result in very low risk to this species from the proposed Project. Loss of potentially suitable habitat will be confined to areas not currently occupied and at distances greater than 785 feet from habitat currently occupied by Washington ground squirrels. Project roads will be far from existing colonies, and speed limits that will be established for Project roads—and that will apply during construction and throughout Project operation—will be such as to minimize the possibility of long-distance dispersers of this species being hit by vehicles.

White-tailed jackrabbit: White-tailed jackrabbit (a State of Oregon Sensitive-Vulnerable species) is narrowly distributed and uncommon on Wheatridge West (Section 4.10.1; Figure 11a), though it uses a variety of the habitat types present. White-tailed jackrabbits are not likely to be at risk from construction or operation of the proposed wind energy development. This species does not seem to be displaced permanently by the construction of such facilities, as it is frequently observed near turbines and other facilities at operational wind farms. The speed limits that will be established for Project roads—and that will apply during construction and throughout Project operation—will be such as to minimize the possibility of vehicular collision.

Hoary bat: Currently available survey methods cannot be used for estimating bat abundance. Nonetheless, the detection of hoary bat (a State of Oregon Sensitive-Vulnerable species) at four of six acoustic monitoring sites (Sec. 4.11.1; tables 7 and 8; Figure 12a) suggests that this species is relatively common and flies through much of Wheatridge West during the late summer and fall months (its migration period). The Project does not provide suitable breeding habitat. This species flies rather high and may not use echo-location while migrating (Kunz et al., 2007; Cryan and Barclay, 2009). It comprises 50.2% of documented bat fatalities at Columbia Plateau wind energy facilities, which occur primarily during August through October and occasionally in spring and early winter (Tables 12 and 13; Figure 13). Individuals of this species are likely at moderate to high risk from the proposed Wheatridge West Wind Energy Facility. The potential risk to populations and to the species as a whole is unknown; however, that risk is expected to be less at Wheatridge West than at facilities sited nearer the species' preferred forest habitats and far less than at facilities in the eastern United States where fatalities tend to be ten times greater than at facilities in the Columbia Plateau ((Johnson, 2005; Arnett et al., 2008; Baerwald and Barclay, 2009).

Silver-haired bat: Currently available survey methods cannot be used for estimating bat abundance. Nonetheless, the detection of silver-haired bat (a federal Species of Concern and a State of Oregon Sensitive-Vulnerable species) at all six acoustic monitoring sites (Sec. *4.11.1*; Tables 7 and 8; Figure 12a) suggests that this species is relatively common and flies through much of Wheatridge West during the late summer and fall months (its migration period). The Project does not provide suitable breeding habitat. This species flies rather high and may not use echo-location while migrating (Kunz et al., 2007; Cryan and Barclay, 2009). It comprises 44.9% of documented bat fatalities at Columbia Plateau wind energy facilities, which occur primarily during August through October and occasionally in spring (Tables 12 and 13; Figure 13). Individuals of this species are likely at moderate to high risk from the proposed Wheatridge West Wind Energy Facility. The potential risk to populations and to the species as a whole is unknown; however, that risk is expected to be less at

Wheatridge West than at facilities sited nearer the species' preferred forest habitats and far less than at facilities in the eastern United States where fatalities tend to be more than ten times greater than at facilities in the Columbia Plateau (Johnson, 2005; Arnett et al., 2008; Baerwald and Barclay, 2009).

Small-footed myotis: Currently available survey methods cannot be used for estimating bat abundance. Nonetheless, the detection of small-footed myotis (a federal Species of Concern) at five of the six acoustic monitoring sites (Sec. *4.11.1*; Tables 7 and 8; Figure 12a) suggests that this species is relatively common and flies through much of Wheatridge West during the late summer and fall months. The Project provides little or no suitable breeding habitat, but likely provides some suitable foraging habitat. This species generally flies at heights below rotor level, and has not been documented as a fatality at any Columbia Plateau wind energy facilities (Table 13). Based on these factors, populations of this species are deemed to be at no risk from the proposed Wheatridge West Wind Energy Facility.

Mule deer: Mule deer used the area around Wheatridge West in all seasons, and were broadly distributed. Most use was in the southern portion, which coincides with designated critical mule deer winter range (Figure 2), primarily in Revegetated Grassland habitat. While as many as 100 individuals were observed together, mule deer were generally detected in much smaller groups. The Revegetated Grassland habitat in which mule deer foraged was widespread in the southern portion of the study area, and the Wheatridge West Site Boundary includes little or no cover or water sources that would lead to concentrations of this species. Mule deer abundance, distribution, and behavior do not expose them to risk from the proposed Wheatridge West Wind Energy Facility.

Greater Sandhill crane: Greater Sandhill crane (a State of Oregon Sensitive-Vulnerable species) was documented on six occasions during avian use surveys at Wheatridge West; these involved a single flock of five individuals in winter, four flocks totaling 130 birds in spring, and one flock of 70 birds in fall (Table 3a). In each case, flocks flew high above the Project area, as is typical of this species when migrating or making other long flights. The Project area does not contain habitats that would attract this species. Though seasonal migrations take this species over much of the Columbia Plateau Ecoregion, there have been none detected as fatalities at CPE wind power projects (Table 11). Construction and operation of Wheatridge West is not expected to expose greater Sandhill crane to risk.

Ferruginous hawk: Breeding territories of ferruginous hawk (a federal Species of Concern and Bird of Conservation Concern and a State of Oregon Sensitive-Critical species) were broadly distributed across the aerial raptor nest survey area for Wheatridge West (Figure 7a), with six separate territories identified during all surveys (though only four active nests are shown in Figure 7a, which only depicts those nests found in the year of raptor nest survey). This species was detected during avian use surveys in all seasons, and at ten of the 16 plots, with the majority of observations occurring in spring and summer. Most suitable breeding and foraging habitat exists outside the areas where facilities are proposed.

Ferruginous hawk comprises 0.2% of the fatalities and 2.4% of the raptor fatalities recorded during scheduled searches at Columbia Plateau Ecoregion wind projects for which fatality monitoring studies have been completed and made public (Table 11). These relatively low numbers are likely reflective of the species' low density in the region and not indicative of a difference (relative to other Buteos) in the susceptibility of individuals to collision. In a recent telemetry study of nests and young within the Columbia Plateau of Oregon, daily survival rate of ferruginous hawk nests decreased as number of turbines within 3.1 km (1.9 mi) increased; while no young in the study died by collision with turbines, juvenile

ferruginous hawks from nests closer to the nearest turbine were more likely to die of predation or starvation prior to dispersing from the natal area than young from nests farther from the nearest turbine (Kolar, 2013). NWC has used satellite telemetry to assess survival and movements of young of this species from Morrow and Gilliam Counties; of six young telemetered, three apparently starved during the post-fledging period, one died within a week of dispersing from the natal area (NWC, unpublished data), one broke its wing (and was subsequently euthanized) on its wintering grounds in NE Arizona (Gerhardt and Anderson, 2013a), and one was killed by a car on its wintering grounds in southeast California (Gerhardt and Anderson, 2013b).

Turbine layouts were adjusted in an effort to minimize the risk to nesting ferruginous hawks. Turbines were sited as much as possible in wheat. In addition, turbines were sited as far as feasible from active ferruginous hawk nests identified during surveys. The resulting layouts may pose a moderate risk to a single ferruginous hawk territory, but are expected to entail a low risk to this species generally.

Swainson's hawk: Swainson's hawk (a State of Oregon Sensitive-Vulnerable) was broadly distributed and quite common during spring and summer at Wheatridge West. There were 20 active nests located within the aerial raptor nest survey area (Sec. *4.5.1*; Figure 7a; a density of 0.16/mi^2), and nests were built in a variety of tree species, including small and dead trees normally considered poor raptor nest sites. Swainson's hawk appears to be susceptible to collision with turbines, and comprises 0.7% of the fatalities recorded during scheduled searches at wind projects in the Columbia Plateau Ecoregion for which fatality monitoring studies have been completed (Table 11). The past several years have seen an increase in fatalities of this species at CPE wind farms; though other factors may also be at play, this increase coincides with observed region-wide increases in overall numbers of Swainson's hawks and their nests.

Siting turbines to avoid risk to Swainson's hawk is made difficult by a number of factors. Nests of this species are more ephemeral than those of other raptors, and Swainson's hawks place their nests in a wider variety of trees, shrubs, and other substrates than other hawks, making predicting locations of future nests problematic. Despite its current status (State Sensitive-Vulnerable), Swainson's hawk is numerous and increasing locally and regionally; if this trend continues, it will likely mean more nests in proximity to turbines and more potential for interaction with rotors. Finally, although the majority of proposed turbine placements are in Dryland Wheat, Swainson's hawks are more likely to hunt in these developed habitat types than are most other raptor species.

For all of these reasons—and despite efforts to avoid known nests—operation of Wheatridge West poses a moderate to high risk to individual Swainson's hawks or pairs. The risk to populations is expected to be low, however, since an increase in the occurrence of fatalities would likely reflect and follow an increase in overall population numbers.

The construction of facilities may pose a risk to active breeding attempts if construction occurs during the Swainson's hawk breeding season.

Golden eagle: Use of Wheatridge West by golden eagle (a federal Bird of Conservation Concern) was primarily confined to the southern portion (Table 6a; Figure 6a) and highest mean use overall was in fall (0.074) and winter (0.037; Table 4a). Since both the adult male and a young male from the nearest nest were followed by telemetry during the year in which avian use surveys were conducted (Sec. 4.8), it is possible to assert with confidence that most or all detections of golden eagles on Wheatridge West were of birds not resident at a nearby territory.

The winter use of the southern portion of Wheatridge West was likely much greater during the year of survey than in most years. The types of prey that typically attract wintering eagles in this region were at best uncommon on the Project. Small numbers of mule deer were present, and jackrabbits, chukar, and pheasant were infrequently encountered; cattle did not calve within the survey area. Voles—a prey species too small to constitute an important part of the diet of a golden eagle—were present at extremely high densities during the fall and winter of avian use study. This resulted in higher than normal numbers of raptor species that do prey extensively on voles, including northern harrier, red-tailed hawk, rough-legged hawk, long-eared owl, and short-eared owl; even snowy owl (an extremely rare winter visitor to this region) was observed with regularity in areas around Wheatridge West during the winter of survey. It is likely that the golden eagles observed using the Project that fall and winter were attracted by the high numbers of other raptors, many of which themselves serve as eagle prey.

The Project has a low likelihood of posing adverse impacts to golden eagles. This is particularly true for resident territorial eagles. All proposed turbines were sited more than seven miles from the nearest identified eagle nest, and telemetry showed that the home range of the adult male and the natal home range of a young male from the nearest active nest did not include the areas in which Project facilities are planned (report and maps submitted to Wheatridge and to ODFW and USFWS personnel).

Proposed Project facilities were sited as much as possible in developed habitat (Dryland Wheat), where neither golden eagles nor their prey are expected to spend much time. Although eagles occasionally fly through such habitat, they are not expected to be susceptible to collision with turbines at those times, since their attention is not likely to be diverted by prey or other eagles. Golden eagles spend the majority of their time in canyons, whereas proposed turbines are sited primarily on ridge tops.

Golden eagle fatalities comprise just 0.1% of avian fatalities and 0.6% of raptor fatalities at CPE wind energy facilities (Table 11). Research indicates that golden eagles are normally capable of detecting and avoiding turbines (Johnston et al., 2014). Whereas as many as six individuals of this species have been recorded as fatalities at wind energy facilities in Oregon (Pagel et al., 2013), these fatalities occurred at only two of the 40 facilities operating in the state, though nearly all such facilities document some level of use by golden eagles during preconstruction surveys. The sole Oregon wind energy facility where multiple golden eagle fatalities have been recorded, the Elkhorn Valley Wind Farm, is anomalous—it is not part of the Columbia Plateau, and turbines were sited almost entirely in native habitats in an area of dense golden eagle nesting (WEST, 2005a). Preconstruction studies at Elkhorn documented far more detections and much higher golden eagle use than at other Oregon sites (including Wheatridge), even though the Elkhorn studies were not conducted in winter, the season expected to have the highest use (as at Wheatridge). Indeed, golden eagle exposure indices at Elkhorn exceeded those of all but four bird species, American robin, tundra swan, European starling, and horned lark (WEST, 2005a).

Of 11 resident adult and nestling golden eagles telemetered by NWC in the CPE and tracked until their death, none collided with wind turbines; shooting, electrocution, and vehicular collision accounted for five, two, and one of the non-natural deaths, respectively (Gerhardt et al., 2013; unpublished NWC data).

Use by eagles of the native habitats outside the Wheatridge West Site Boundary was quite seasonal, with the majority of detections occurring in the fall and winter seasons. High vole numbers—and consequent high densities of other raptor species—during the fall and winter

of the avian use survey likely yielded golden eagle use numbers much greater than that which can be expected during most years.

Burrowing owl: Burrowing owl (a federal Species of Concern and a State of Oregon Sensitive-Critical) was rare at Wheatridge West; a single occupied burrow (assumed to be a breeding den) was documented during special status vertebrate wildlife species surveys (Sec. 4.10.1; Figure 7a). This species is not generally susceptible to collision with turbines; despite its documented presence at numerous Columbia Plateau wind energy developments, it has been recorded as a fatality only once. (This bird was determined by its band to be a migrant, rather than a local breeder.) As a highly auditory species, burrowing owl may be displaced from previously occupied breeding areas by the construction and operation of facilities at wind energy developments (for related research, see Barber et al., 2010). Nonetheless, burrowing owl is at low risk from the proposed Wheatridge West Wind Energy Facility (based on low incidence of collision with turbines and low use of the Project area).

Long-billed curlew: Long-billed curlew (a federal Bird of Conservation Concern and a State of Oregon Sensitive-Vulnerable species) is patchily distributed but relatively common at Wheatridge West. There were 19 detections during special status vertebrate wildlife species surveys (Section 4.10.1; Figure 11a) and numerous detections at nine of 17 avian use study plots (Section 4.4.1; Tables 3a, 4a, and 6a; Figure 6a) during spring and early summer. Despite its documented presence (during less than half of the year) at numerous Columbia Plateau wind energy developments, this species has been recorded as a fatality only twice (Table 11), once during scheduled searches (Gritski and Kronner, 2010b) and once incidentally (Gritski and Downes, 2011b) though preliminary analysis at the nearby Shepherd's Flat North wind project identified several fatalities there as being this species (Powell et al., 2013). Nor does displacement from suitable habitat seem to be a significant problem for this species; anecdotally, individuals and pairs have been found in close proximity to operating turbines (e.g., Gritski and Downes, 2012; Downes et al., 2013). Long-billed curlew is deemed to be at low risk from the proposed Wheatridge West Wind Energy Facility.

Loggerhead shrike: Loggerhead shrike (a federal Bird of Conservation Concern and a State of Oregon Sensitive-Vulnerable species) is narrowly distributed and relatively uncommon on Wheatridge West, confined primarily to Basin Big Sagebrush Shrub-steppe in the northern portion. There were five detections during special status vertebrate wildlife species surveys (Sec. 4.10.1; Figure 11a) and eight detections at two plots during avian use surveys (Sec. 4.4.1; Table 3a; Figure 6a). This species tends to fly low, is not considered susceptible to collision with turbines, and has not been recorded as a fatality at any wind energy development in the Columbia Plateau Ecoregion (Table 11). The proposed Wheatridge West Wind Energy Facility does not pose a risk to loggerhead shrike.

Grasshopper sparrow: Grasshopper sparrow (a State of Oregon Sensitive-Vulnerable species) is widely distributed across Wheatridge West, is found in most habitat types, and is among the most abundant avian species during spring and early summer (Section 4.10.1; Figure 11a). This species tends to fly low, and is not considered susceptible to collision with turbines; despite its abundance, only a single individual of this species has been recorded as a fatality at any wind energy developments in the Columbia Plateau Ecoregion (Table 11). Present only four to five months of the year, grasshopper sparrow is at very low risk of direct impact from the proposed Wheatridge West Wind Energy Facility. Because of this species' local and regional abundance and its ability to utilize a variety of habitat types, the small amount of loss of suitable habitat and potential for slight displacement associated with construction and operation of Wheatridge West are not expected to constitute a significant adverse effect to grasshopper sparrow.

Laurent's milkvetch: A single population of Laurent's milkvetch (a federal Species of Concern and an Oregon Department of Agriculture Threatened Species) was located during surveys associated with Wheatridge West. The proposed facilities pose no risk to this species because facilities are being sited to avoid this population.

4) "What are the potential risks of adverse impacts of the proposed [Wheatridge West] wind energy project to individuals and local populations of species of concern and their habitats? In the case of rare or endangered species, what are the possible impacts to such species and their habitats?"

Washington ground squirrel: Construction and operation of facilities may entail a loss of potentially suitable Washington ground squirrel breeding and foraging habitat (not currently occupied). Individuals may be at risk of being injured or killed by Project vehicles.

White-tailed jackrabbit: Construction and operation of facilities may entail a loss of suitable breeding and foraging habitat for this species. Individuals may be at risk of being injured or killed by Project vehicles.

Hoary bat: The potential adverse effect to this species is collision with turbines (Table 13), which is most likely during migration (August through October; Figure 13) and at wind speeds up to approximately 5 s^{-1} (Horn et al., 2008).

Silver-haired bat: The potential adverse effect to this species is collision with turbines (Table 13), which is most likely during migration (August through October; Figure 13) and at wind speeds up to approximately 5 s^{-1} (Horn et al., 2008).

Small-footed myotis: No significant adverse effects to this species are anticipated.

Mule deer: The potential adverse effect to mule deer is loss of suitable habitat, which is of greatest concern in the designated critical winter range (ODFW, 2013; Figure 2).

Concerns have been raised that construction and operation of wind energy facilities may result in the displacement of mule deer from remaining suitable habitat (WEST, 2010). The study from which this conclusion came did not control for a number of variables likely to have a greater among-year effect (than wind energy facilities) on mule deer distribution, and this concern is belied by abundant anecdotal evidence of this species' foraging, resting, and even calving in very close proximity to turbines, roads, and other facilities (see, e.g., Kronner et al., 2008b).

Greater Sandhill crane: No adverse effects to greater Sandhill crane are anticipated from construction and operation of the Project. Use of the area by this species was brief, and confined to the air space high above proposed facilities; the Project contains no habitat expected to attract individuals or flocks of this species, and no greater Sandhill cranes have been detected as fatalities at CPE wind power projects (Table 11).

Ferruginous hawk: Potential adverse effects to ferruginous hawk are collision with moving rotors and disturbance by construction activities of active breeding attempts.

Swainson's hawk: Potential adverse effects to Swainson's hawk are collision with moving rotors and disturbance by construction activities of active breeding attempts.

Golden eagle: The potential adverse effect to golden eagle is collision with moving rotors. In the case of Wheatridge West, the risk of collision is likely to be associated not with breeding resident adults or fledglings from the nearest territories but with migrant eagles, especially during winter months and in rare years of high densities of other raptors (because of high densities of voles).

Burrowing owl: Potential adverse effects to burrowing owls are loss of suitable habitat, disturbance of active breeding attempts during construction, and possible displacement from suitable breeding and foraging habitat.

Long-billed curlew: Construction and operation of facilities may entail a loss of suitable breeding and foraging habitat for this species. Long-billed curlews are susceptible to human disturbance during the breeding season, which can result in nest abandonment or disruption of brood-rearing (Dugger and Dugger, 2002); the construction of facilities may pose a risk to the success of active long-billed curlew breeding attempts if construction occurs during the breeding season.

Loggerhead shrike: The potential adverse effect to loggerhead shrike is habitat loss. As proposed, however, Wheatridge West facilities layout involves the loss of a maximum of 2.5 acres of Basin Big Sagebrush Shrub-steppe (Table 2b), the habitat type with which this species is most closely associated. No significant adverse effects to loggerhead shrike are anticipated.

Grasshopper sparrow: Construction and operation of facilities may entail a loss of suitable breeding and foraging habitat for grasshopper sparrow. In addition, studies have indicated that this species may be displaced from suitable breeding habitat by the construction and operation of wind energy facilities (NWC and WEST, 2007; Johnson and Shaffer, 2008).

Laurent's milkvetch: Adverse effects to Laurent's milkvetch were avoided by the siting of proposed facilities outside of areas of occurrence of this species. No adverse effects to this species are anticipated.

5) "How can developers mitigate identified significant adverse impacts?"

Washington ground squirrel: Facilities were sited to avoid direct adverse effects to Washington ground squirrel. Locations of burrows where ground squirrels were detected (or the outlying burrows for larger colonies) were used for designating Category 1 habitat around these areas of use in accordance with Oregon Administrative Rule (OAR) 635-415-0025. Subsequent micrositing of Project facilities was done to avoid this Category 1 habitat. It is expected that the operator will have a wildlife biologist on hand for construction monitoring that will include ensuring that Washington ground squirrels have not expanded from the areas where they were documented into areas where facilities are being constructed.

The Applicant has minimized loss of potential suitable habitat (not currently occupied) by siting facilities as much as possible in non-suitable or developed habitat. Loss of potentially suitable habitat will be mitigated at appropriate levels that are based on calculated acres of temporary and permanent impacts and assessment of habitat categorization (Sec. 5.1.1; Table 2a) as a provision of the Habitat Mitigation Plan, draft concepts for which will accompany the Application for Site Certificate.

White-tailed jackrabbit: The Applicant has minimized loss of suitable habitat by siting facilities as much as possible in developed (Dryland Wheat) habitat. Loss of suitable white-

tailed jackrabbit habitat will be mitigated at appropriate levels that are based on calculated acres of temporary and permanent losses and assessment of habitat categorization (Sec. 5.1.1; Table 2a) as a provision of the Habitat Mitigation Plan, draft concepts for which will accompany the Application for Site Certificate.

Hoary bat: The Applicant has minimized both loss of habitat for and potential for collision by hoary bats by siting the Project far from this species' forest habitat and by micrositing Project facilities as much as possible in developed (Dryland Wheat) habitat.

Silver-haired bat: The Applicant has minimized both loss of habitat for and potential for collision by silver-haired bats by siting the Project far from this species' forest habitat and by micrositing Project facilities as much as possible in developed (Dryland Wheat) habitat.

Small-footed myotis: No significant adverse effects to this species are anticipated.

Mule deer: The Applicant has minimized loss of suitable habitat by siting facilities as much as possible in developed (Dryland Wheat) habitat. Loss of suitable mule deer habitat will be mitigated at appropriate levels that are based on calculated acres of temporary and permanent losses and assessment of habitat categorization (Sec. 5.1.1; Table 2a) as a provision of the Habitat Mitigation Plan, draft concepts for which will accompany the Application for Site Certificate. Within the small amount of designated mule deer winter range (Figure 2), mitigation acres will exceed acres of loss.

Ferruginous hawk: The Applicant has minimized risk of ferruginous hawk collision by siting turbines as much as possible in disturbed habitats. In addition, the Applicant has utilized the raptor nest data to site turbines as far from known nests as possible. The operator can further minimize potential disturbance to any active ferruginous hawk breeding attempts (identified by the wildlife biologist conducting pre-construction and construction monitoring during the spring of construction) by restricting the construction of any Project facilities within close proximity of those active nests to outside the ferruginous hawk breeding season (February through July).

Swainson's hawk: The Applicant has minimized risk of Swainson's hawk collision by siting turbines as much as possible in disturbed habitats. In addition, the Applicant has utilized the raptor nest data to site turbines as far from known nests as possible. The operator can further minimize potential disturbance to any active Swainson's hawk breeding attempts (identified by the wildlife biologist conducting pre-construction and construction monitoring during the spring of construction) by restricting the construction of any Project facilities within close proximity of those active nests to outside the Swainson's hawk breeding season (April through August).

Golden eagle: The Applicant has minimized potential risk of collision to golden eagles by siting turbines in disturbed habitat. In addition, the applicant has sited turbines as far from known nests as possible, having first undertaken four years of golden eagle nest survey and monitoring and three years of telemetry studies at the nearest active nest. All proposed turbines at Wheatridge West are more than seven miles from identified golden eagle nests.

Burrowing owl: The Applicant has minimized potential displacement of burrowing owls and loss of suitable habitat by siting turbines in disturbed habitat. In addition, the Applicant has utilized these baseline study data to site turbines as far from identified nests as possible. The operator can further minimize potential disturbance to burrowing owl breeding attempts by restricting the construction of Project facilities to outside the burrowing owl breeding season (February through July) wherever facilities are within close proximity of dens

identified as active (by the wildlife biologist conducting construction monitoring) during the spring of construction. Loss of suitable denning and hunting habitat will be mitigated at appropriate levels that are based on calculated acres of temporary and permanent losses and assessment of habitat categorization (Sec. 5.1.1; Table 2a) as a provision of the Habitat Mitigation Plan, draft concepts for which will accompany the Application for Site Certificate.

Long-billed curlew: The Applicant has minimized loss of suitable long-billed curlew breeding and foraging habitat by siting facilities in developed habitat wherever possible. The operator can further minimize potential disturbance to long-billed curlew breeding attempts by restricting the construction of Project facilities to outside the curlew breeding season (March through July) wherever facilities are within close proximity of nests identified as active (by the wildlife biologist conducting construction monitoring) during the spring of construction. Loss of suitable breeding and foraging habitat will be mitigated at appropriate levels that are based on calculated acres of temporary and permanent losses and assessment of habitat categorization (Sec. 5.1.1; Table 2a) as a provision of the Habitat Mitigation Plan, draft concepts for which will accompany the Application for Site Certificate.

Loggerhead shrike: The Applicant has minimized loss of suitable loggerhead shrike habitat by siting facilities in developed habitat wherever possible. Facilities are proposed in a maximum of 2.5 acres of the Basin Big Sagebrush Shrub-steppe habitat with which loggerhead shrike is associated (Table 2b). No significant adverse effects to this species are anticipated from construction and operation of Wheatridge West.

Grasshopper sparrow: The Applicant has minimized the potential for displacement of grasshopper sparrows and loss of suitable habitat by siting facilities as much as possible in disturbed habitats. Loss of suitable grasshopper sparrow breeding and foraging habitat will be mitigated at appropriate levels that are based on calculated acres of temporary and permanent losses and assessment of habitat categorization (Sec. 5.1.1; Table 2a) as a provision of the Habitat Mitigation Plan, draft concepts for which will accompany the Application for Site Certificate.

In summary, potential adverse effects of the proposed Wheatridge West Wind Energy Facility to species of concern include loss of small amounts of suitable habitat (Washington ground squirrel, white-tailed jackrabbit, mule deer, long-billed curlew, loggerhead shrike, and grasshopper sparrow), risk of collision with turbine rotors (hoary bat, silver-haired bat, Swainson's hawk, ferruginous hawk, and golden eagle), and disturbance of breeding attempts by construction activities (avian species of concern, primarily Swainson's hawk, ferruginous hawk, and burrowing owl). Besides avoidance and minimization efforts associated with the micrositing of facilities, the following avoidance, minimization, and mitigation procedures either are already in place or are recommended:

- Mitigation for temporary and permanent loss of habitat for all species will be provided through the Habitat Mitigation Plan as a condition of the Site Certificate.
- Disturbance of breeding attempts should be avoided by limiting construction activities to outside the breeding season where facilities are planned within close proximity to nests identified as active during the spring of construction; it is anticipated that standard seasonal construction buffers may be applied as a condition of the Site Certificate. Breeding seasons (for species of concern nesting near Wheatridge West) are:
    - Ferruginous hawk: February through July;
    - Swainson's hawk: April through August;
    - Burrowing owl: February through July.

- It is anticipated that the speed limits established for Project roads as a condition of the Site Certificate will be such as to avoid the risk of vehicle-caused fatalities of Washington ground squirrel, white-tailed jackrabbit, and mule deer.

6) "Are there studies that should be initiated at this stage that would be continued in post-construction?"

All of the preconstruction surveys conducted at Wheatridge West and the surrounding area are amenable to being repeated or continued during the operational phase of the Project; the question becomes whether a particular study is warranted.

The purpose of conducting Washington ground squirrel surveys was to allow the Applicant to avoid any adverse impacts to this species. The Project was sited to avoid both all areas being used by WGS and large areas of potential suitable habitat (not being used) around those use areas. In addition—and despite having avoided adverse impacts—the operator will be expected to mitigate for loss of potentially suitable habitat (not being used by this species and not adjacent to areas of use) as outlined in the Habitat Mitigation Plan that will be a condition of the Site Certificate. Therefore, whereas allowing or participating in future WGS surveys within the Project area may be helpful for the agencies tasked with monitoring this species, requiring the Applicant, operator, or landowners to conduct or pay for such surveys would seem to be contradictory to the process that has been established to achieve avoidance and that has been followed on this Project.

Potential adverse effects to other species of concern have been or will be avoided, minimized, and/or adequately mitigated, so that significant adverse effects of any kind are not expected and discernible adverse effects are extremely unlikely. For one or more of the raptor species of concern, however, potential adverse effects cannot be completely avoided, and actual effects to the local breeding population could best be assessed by a subsequent survey of breeding numbers (active nests) following protocols used prior to construction. Given the number of wind energy facilities that have been developed within the Columbia Plateau of Oregon, most of them with some level of pre- and post-construction raptor nest survey completed, it is likely that the data are already available to determine whether significant changes in breeding numbers of these species are occurring across the region. More problematic is assigning causation to any such changes, with the construction and operation of wind turbines being just one of many factors affecting raptor breeding populations. Nonetheless, should fatality monitoring at Wheatridge West identify a potential problem for locally breeding raptors, the preconstruction raptor survey could be replicated during the operational phase of the Project.

As with these raptor species of concern, potential adverse effects to hoary bat and silver-haired bat cannot be completely avoided. For bats, however, acoustic inventory methods do not yield an assessment of numbers or densities, but only of species presence. The preconstruction acoustic bat inventory is repeatable, and similar surveys could be conducted periodically during the years of operation of Wheatridge West (as to assess continued presence near the Project of these species of concern). Repetition of such studies will not, however, allow for quantitative comparisons of bat numbers pre- and post-construction.

5.2 Wheatridge East

5.2.1 Wildlife Habitat Loss by Type and Category

Impacts to wildlife habitat include both temporary and permanent habitat loss. Habitat loss and various levels of habitat alteration and disturbance occur mainly during construction. Periodically during operations, additional temporary impacts may occur for facility repairs or

upgrades. These will be restored as required in the Permit Conditions. Permanent impacts are those where Project facilities are located for the life of the Project or where complete restoration of temporarily impacted habitats may not be attainable. Mature sagebrush shrubs in Shrub-steppe habitat may not be restored to the pre-construction structural stage for an extensive time-period (20–30 years or more).

Table 2b delineates the acreages of habitat loss—temporary and permanent—expected under each of two layouts. The maximum acreages are those that would be impacted if the smaller turbines are chosen (as more of them would be required to attain the target generating capacity); the minimum acreages are those associated with the larger turbines. (In the case of Wheatridge East, the temporary minimum acreages actually turn out to be slightly greater than the maximum acreages due to non-turbine facilities.)

No temporary or permanent habitat loss will occur in Category 1 habitats.

The maximum layout entails the permanent loss of 41.4 acres and the temporary loss of an additional 245.8 acres (Table 2b). The majority of this loss (72% of permanent loss and 70% of temporary loss) will be in Category 6 Dryland Wheat habitat. Category 3 habitats—Native Perennial Grassland and Rabbitbrush/Snakeweed Shrub-steppe—comprise 16% of permanent and 19% of temporary loss, and Category 4 habitats comprise 12% of permanent and temporary habitat loss.

The minimum layout entails the permanent loss of 38.4 acres and the temporary loss of an additional 250.5 acres (Table 2b). The majority of this loss (72% of permanent loss and 70% of temporary loss) will be in Category 6 Dryland Wheat habitat. Category 3 habitats—Native Perennial Grassland and Rabbitbrush/Snakeweed Shrub-steppe—comprise 16% of permanent and 19% of temporary loss, and Category 4 habitats comprise 12% of permanent and 11% of temporary habitat loss.

Permanent loss of Category 2, Category 3, and Category 4 habitats will be mitigated for under the Project's Habitat Mitigation Plan. For that purpose, all impacts occurring within designated deer winter range (ODFW, 2013) are deemed to require the level of mitigation appropriate for Category 2 habitat (more than 1 acre of mitigation for every acre of permanent loss) without regard for habitat type and quality (except that Category 6 habitats are excluded from this delineation). Acreages of habitat impacts are also calculated under this scheme in Table 2b.

5.2.2 Answers to Tier 3 Questions

1) "Do field studies indicate that species of concern are present on or likely to use the proposed [Wheatridge East] site?"

Field studies indicated the presence of several species of concern. These were Washington ground squirrel, white-tailed jackrabbit, hoary bat, silver-haired bat, small-footed myotis, greater Sandhill crane, Swainson's hawk, ferruginous hawk, golden eagle, long-billed curlew, burrowing owl, peregrine falcon, loggerhead shrike, grasshopper sparrow, and Laurent's milkvetch. Mule deer, a common species with no special status but nonetheless of management concern to ODFW, was also present.

2) "Do field studies indicate the potential for significant adverse impacts on affected populations of species of habitat fragmentation concern?"

Washington ground squirrel: Habitat fragmentation has been identified as a potential concern for populations of this species. In the case of Wheatridge East, however, further

habitat fragmentation is not expected to occur. As discussed below, Project facilities were microsited to avoid ground squirrel areas of use and adjacent suitable habitat. Moreover, the facilities were wherever possible sited in disturbed habitat types that do not provide suitable habitat for this species. In addition, the facilities themselves (even were they placed within potential suitable habitat) are not deemed to constitute a barrier to dispersal by individuals of this species.

3) "What is the distribution, relative abundance, behavior, and site use of species of concern identified in Tiers 1 or 2, and to what extent do these factors expose these species to risk from the proposed [Wheatridge East] wind energy project?"

Washington ground squirrel: Washington ground squirrel (a federal Candidate Species and a State of Oregon Endangered Species) is broadly distributed and somewhat abundant within its distribution at Wheatridge East (Sec. 4.10.2; Figure 9b). Nonetheless, avoidance measures (discussed above and below) will result in very low risk to this species from the proposed Project. Loss of potentially suitable habitat will be confined to areas not currently occupied and areas at distances greater than 785 feet from habitat currently occupied by Washington ground squirrels. Project roads will be far from existing areas of use, and speed limits that will be established for Project roads—and that will apply during construction and throughout Project operation—will be such as to minimize the possibility of long-distance dispersers of this species being hit by vehicles.

White-tailed jackrabbit: White-tailed jackrabbit (a State of Oregon Sensitive-Vulnerable species) is widely distributed and relatively common on Wheatridge East (Section 4.10.2; Figure 11b) and uses a variety of the habitat types present. White-tailed jackrabbits are not likely to be at risk from construction or operation of the proposed wind energy development. This species does not seem to be displaced permanently by the construction of such facilities, as it is frequently observed near turbines and other facilities at operational wind farms. The speed limits that will be established for Project roads—and that will apply during construction and throughout Project operation—will be such as to minimize the possibility of vehicular collision.

Hoary bat: Currently-available survey methods cannot be used for estimating bat abundance. Nonetheless, the detection of hoary bat (a State of Oregon Sensitive-Vulnerable species) at one of the four acoustic monitoring sites (Sec. 4.11.2; tables 7 and 8; Figure 12b) confirms this species' occurrence at Wheatridge East during the late summer and fall months (its migration period). The Project does not provide suitable breeding habitat. This species flies rather high and may not use echo-location while migrating (Kunz et al., 2007; Cryan and Barclay, 2009). It comprises 50.2% of documented bat fatalities at Columbia Plateau wind energy facilities, which occur primarily during August through October (Tables 12 and 13; Figure 13). Individuals of this species are likely at moderate to high risk from the proposed Wheatridge East Wind Energy Facility. The potential risk to populations and to the species as a whole is unknown; however, that risk is expected to be less at Wheatridge East than at facilities sited nearer the species' preferred forest habitats and far less than at facilities in the eastern United States where fatalities tend to be more than ten times greater than at facilities in the Columbia Plateau (Johnson, 2005; Arnett et al., 2008; Baerwald and Barclay, 2009).

Silver-haired bat: Currently-available survey methods cannot be used for estimating bat abundance. Nonetheless, the detection of silver-haired bat (a federal Species of Concern and a State of Oregon Sensitive-Vulnerable species) at three of the four acoustic monitoring sites (Sec. 4.11.2; Tables 7 and 8; Figure 12b) suggests that this species is relatively common and flies through much of Wheatridge East during the late summer and fall months

(its migration period). The Project does not provide suitable breeding habitat. This species flies rather high and may not use echo-location while migrating (Kunz et al., 2007; Cryan and Barclay, 2009). It comprises 44.9% of documented bat fatalities at Columbia Plateau wind energy facilities, which occur primarily during August through October (Tables 12 and 13; Figure 13). Individuals of this species are likely at moderate to high risk from the proposed Wheatridge East Wind Energy Facility. The potential risk to populations and to the species as a whole is unknown; however, that risk is expected to be less at Wheatridge East than at facilities sited nearer the species' preferred forest habitats and far less than at facilities in the eastern United States where fatalities tend to be more than ten times greater than at facilities in the Columbia Plateau (Johnson, 2005; Arnett et al., 2008; Baerwald and Barclay, 2009).

Small-footed myotis: Currently-available survey methods cannot be used for estimating bat abundance. Nonetheless, the detection of small-footed myotis (a federal Species of Concern) at two of the four acoustic monitoring sites (Sec. 4.11.2; Tables 7 and 8; Figure 12b) suggests that this species is relatively common and flies through much of Wheatridge East during the late summer and fall months. The Project provides little or no suitable breeding habitat, but some potential foraging habitat. This species generally flies at heights below rotor level, and has not been documented as a fatality at any Columbia Plateau wind energy facilities (Table 13). Based on these factors, populations of this species are deemed to be at no risk from the proposed Wheatridge East Wind Energy Facility.

Mule deer: Mule deer used the area around Wheatridge East in all seasons (though less frequently in fall), and were broadly distributed. Whereas as many as 45 individuals were observed together, mule deer were generally detected in much smaller groups. Only a small portion of the southern end of the Wheatridge East Site Boundary lies within designated critical mule deer winter range (Figure 2). The Site Boundary includes little or no cover or water sources that would lead to concentrations of this species. Mule deer abundance, distribution, and behavior do not expose them to risk from the proposed Wheatridge East Wind Energy Facility.

Greater Sandhill crane: Greater Sandhill crane (a State of Oregon Sensitive-Vulnerable species) was detected on two occasions during winter season avian use surveys; the two flocks totaled 134 birds (Table 3b). In each case, flocks flew high above the Project area, as is typical of this species when migrating or making other long flights. The Project area does not contain habitats that would attract this species. Though seasonal migrations take this species over much of the Columbia Plateau Ecoregion, there have been none detected as fatalities at CPE wind power projects (Table 11). Construction and operation of Wheatridge East is not expected to expose greater Sandhill crane to risk.

Ferruginous hawk: Ferruginous hawk (a federal Species of Concern and Bird of Conservation Concern and a State of Oregon Sensitive-Critical species) was detected infrequently during avian use surveys in all seasons, and at four of the eight plots. Nesting territories (two active nests and many old nests) were identified near Wheatridge East during aerial raptor nest surveys; the active nests were, however, more than two miles from where turbines are now proposed (and so are not within the survey boundary shown in Figure 7b). Most suitable breeding and foraging habitat exists outside the areas where facilities are proposed.

Ferruginous hawk is comprises 0.2% of the fatalities and 2.4% of the raptor fatalities recorded during scheduled searches at Columbia Plateau Ecoregion wind projects for which fatality monitoring studies have been completed and made public (Table 11). These relatively low numbers are likely reflective of the species' low density in the region and not indicative of a difference (relative to other Buteos) in the susceptibility of individuals to

collision. In a recent telemetry study of nests and young within the Columbia Plateau of Oregon, daily survival rate of ferruginous hawk nests decreased as number of turbines within 3.1 km (1.9 mi) increased; while no young in the study died by collision with turbines, juvenile ferruginous hawks from nests closer to the nearest turbine were more likely to die of predation or starvation prior to dispersing from the natal area than young from nests farther from the nearest turbine (Kolar, 2013). NWC has used satellite telemetry to assess survival and movements of young of this species from Morrow and Gilliam Counties; of six young telemetered, three apparently starved during the post-fledging period, one died within a week of dispersing from the natal area (NWC, unpublished data), one broke its wing (and was subsequently euthanized) on its wintering grounds in NE Arizona (Gerhardt and Anderson, 2013a), and one was killed by a car on its wintering grounds in southeast California (Gerhardt and Anderson, 2013b).

The proposed Wheatridge East Wind Energy Facility poses a low risk to ferruginous hawk (with turbines proposed primarily in wheat and far from identified nests).

Swainson's hawk: Swainson's hawk (a State of Oregon Sensitive-Vulnerable species) was broadly distributed but uncommon at Wheatridge East. Although the species was detected occasionally at each of the eight avian use study plots (Sec. 4.4.2; Tables 3b, 4b, and 6b; Figure 6b), the two active nests located were confined to the canyon at the south end of the aerial raptor nest survey area (Sec. 4.5.2; Figure 7b). Swainson's hawk appears to be susceptible to collision with turbines, and comprises 0.7% of the fatalities recorded during scheduled searches at wind farms in the Columbia Plateau Ecoregion for which fatality monitoring studies have been completed and made publicly available (Table 11). The past several years have seen an increase in fatalities of this species at CPE wind farms; though other factors may also be at play, this increase coincides with observed region-wide increases in overall numbers of Swainson's hawks and their nests.

Although proposed Wheatridge East turbines are not in close proximity to known nests of this species, there remains at least a low risk from this Project to individual Swainson's hawk. Nests of this species are ephemeral relative to many other raptors, and Swainson's hawks are quite flexible in the substrates used for nesting, making the predicting of future nest locations difficult. Moreover, if local and regional population numbers continue to increase, the potential for the occasional fatality will likely also increase. Finally, although the majority of proposed turbines are in Dryland Wheat habitat, Swainson's hawk is more likely to forage over this disturbed habitat type than are other raptor species. Nonetheless, the risk of Wheatridge East to populations of Swainson's hawk is expected to be low, since an increase in the occurrence of fatalities would likely reflect and follow an increase in overall population numbers.

The construction of facilities may pose a risk to active breeding attempts if construction occurs during the Swainson's hawk breeding season.

Golden eagle: Use of Wheatridge East by golden eagle (a federal Bird of Conservation Concern) was confined almost entirely to the winter season (Tables 3b and 4b), with one or more detections at seven of the eight avian use plots (Table 6b; Figure 6b). Since both the adult male and a young male from the nearest nest were followed by telemetry during the year in which avian use surveys were conducted (Sec. 4.8; confidential maps submitted separately to agency personnel), it is possible to assert with confidence that most or all detections of golden eagles on Wheatridge East were of migrants or other birds not resident at a nearby territory.

The winter use of Wheatridge East was likely much greater during the year of survey than in most years. The types of prey that typically attract wintering eagles in this region are at best uncommon on the Project. Small numbers of mule deer were present, and jackrabbits, chukar, and gray partridge were infrequently encountered; cattle did not calve within the survey area. Voles—a prey species too small to constitute an important part of the diet of a golden eagle—were present at extremely high densities during the fall and winter of avian use study. This resulted in higher than normal numbers of raptor species that do prey extensively on voles, including northern harrier, red-tailed hawk, rough-legged hawk, long-eared owl, and short-eared owl; even snowy owl (an extremely rare winter visitor to this region) was observed with regularity in areas around Wheatridge East during the winter of survey. It is likely that the golden eagles observed using the Project that winter were attracted by the high numbers of other raptors, many of which themselves serve as eagle prey.

The Project has a low likelihood of posing adverse impacts to golden eagles. This is particularly true for resident territorial eagles. All proposed turbines were sited more than four miles from the nearest identified eagle nest, and telemetry showed that the home range of the adult male and the natal home range of a young male from the nearest active nest did not include the areas in which Project facilities are planned (report and maps submitted to Wheatridge and to ODFW and USFWS personnel).

Proposed Project facilities were sited as much as possible in developed habitat (Dryland Wheat), where neither golden eagles nor their prey are expected to spend much time. Although eagles occasionally fly through such habitat, they are not expected to be susceptible to collision with turbines at those times, since their attention is not likely to be diverted by prey or other eagles. Golden eagles spend the majority of their time in canyons, whereas proposed turbines are sited primarily on ridge tops.

Golden eagle fatalities comprise 0.1% of avian fatalities and 0.6% of raptor fatalities at CPE wind energy facilities (Table 11). Research indicates that golden eagles are normally capable of detecting and avoiding turbines (Johnston et al., 2014). Whereas as many as six individuals of this species have been recorded as fatalities at wind energy facilities in Oregon (Pagel et al., 2013), these fatalities occurred at only two of the 40 facilities operating in the state, though nearly all such facilities document some level of use by golden eagles during preconstruction surveys. The sole Oregon wind energy facility where multiple golden eagle fatalities have been recorded, the Elkhorn Valley Wind Farm, is anomalous—it is not part of the Columbia Plateau, and turbines were sited almost entirely in native habitats in an area of dense golden eagle nesting (WEST, 2005a). Preconstruction studies at Elkhorn documented far more detections and much higher golden eagle use than at other Oregon sites (including Wheatridge), even though the Elkhorn studies were not conducted in winter, the season expected to have the highest use (as at Wheatridge). Indeed, golden eagle exposure indices at Elkhorn exceeded those of all but four bird species, American robin, tundra swan, European starling, and horned lark (WEST, 2005a).

Of 11 resident adult and nestling golden eagles telemetered by NWC in the CPE and tracked until their death, none collided with wind turbines; shooting, electrocution, and vehicular collision accounted for five, two, and one of the non-natural deaths, respectively (Gerhardt et al., 2013; unpublished NWC data).

Use by eagles of the native habitats outside the Wheatridge East Site Boundary was quite seasonal, with the majority of detections occurring in the fall and winter seasons. High vole numbers—and consequent high densities of other raptor species—during the fall and winter

of the avian use survey likely yielded golden eagle use numbers much greater than that which can be expected during most years.

Peregrine falcon: There were three detections of peregrine falcon (a federal Bird of Conservation Concern and a State of Oregon Sensitive-Vulnerable species) during avian use surveys at Wheatridge East, two during winter and one during summer (Table 3b). The nearest known breeding territory for this species is in the Columbia Gorge in Gilliam County, and no suitable nest cliffs are found near Wheatridge. Use of Wheatridge East by this species is more likely during fall and winter, and is expected to consist of dispersing and migrant individuals. Risk is considered to be very low, both because of the low use of the area and because of the infrequency of collisions; a single individual has been documented as a fatality at wind projects in the CPE for which fatality monitoring studies have been completed (Table 11).

Burrowing owl: Burrowing owl (a federal Species of Concern and a State of Oregon Sensitive-Critical species) was uncommon at Wheatridge East; two occupied burrows (assumed to be active breeding dens) were documented during special status vertebrate wildlife species surveys (Sec. 4.10.2; Figure 7b). This species is not generally susceptible to collision with turbines; despite its documented presence at numerous Columbia Plateau wind energy developments, it has been recorded as a fatality only once (Table 11). (This bird was determined by its band to be a migrant, rather than a local breeder.) As a highly auditory species, burrowing owl may be displaced from previously occupied breeding areas by the construction and operation of facilities at wind energy developments (for related research, see Barber et al., 2010). Nonetheless, burrowing owl is at low risk from the proposed Wheatridge East Wind Energy Facility (based on low incidence of collision with turbines low use of the Project area).

Long-billed curlew: Long-billed curlew (a federal Bird of Conservation Concern and a State of Oregon Sensitive-Vulnerable species) is broadly distributed and relatively common at Wheatridge East. There were 13 detections during special status vertebrate wildlife species surveys (Section 4.10.2; Figure 11b) and detections at each of the eight avian use study plots (Section 4.4.2; Tables 3b, 4b, and 6b; Figure 6b) during spring and early summer. Despite its documented presence (during less than half of the year) at numerous Columbia Plateau wind energy developments, this species has been recorded as a fatality only twice (Table 11), once during scheduled searches (Gritski and Kronner, 2010b) and once incidentally (Gritski and Downes, 2011), though preliminary analysis at the nearby Shepherd's Flat North wind project identified several fatalities there as being this species (Powell et al., 2013). Nor does displacement from suitable habitat seem to be a significant problem for this species; anecdotally, individuals and pairs have been found in close proximity to operating turbines (e.g., Gritski and Downes, 2012; Downes et al., 2013). Long-billed curlew is deemed to be at low risk from the proposed Wheatridge East Wind Energy Facility.

Loggerhead shrike: Loggerhead shrike (a federal Bird of Conservation Concern and a State of Oregon Sensitive-Vulnerable species) is uncommon on Wheatridge East, which contains little of the habitat type—Basin Big Sagebrush Shrub-steppe—preferred by this species. There were no detections during special status vertebrate wildlife species surveys (Sec. 4.10.2; Figure 11b) and a single spring detection during avian use surveys (Sec. 4.4.2; Table 3b; Figure 6b). This species tends to fly low, is not considered susceptible to collision with turbines, and has not been recorded as a fatality at any wind energy development in the Columbia Plateau Ecoregion (Table 11). The proposed Wheatridge East Wind Energy Facility does not pose a risk to loggerhead shrike.

Grasshopper sparrow: Grasshopper sparrow (a State of Oregon Sensitive-Vulnerable species) is widely distributed across Wheatridge East, is found in most habitat types, and is among the most abundant avian species during spring and early summer (Section 4.10.2; Figure 11b). This species tends to fly low, and is not considered susceptible to collision with turbines; despite its abundance, only a single individual of this species has been recorded as a fatality at any wind energy developments in the Columbia Plateau Ecoregion (Table 11). Present only four to five months of the year, grasshopper sparrow is at very low risk from the proposed Wheatridge East Wind Energy Facility. Because of this species' local and regional abundance and its ability to utilize a variety of habitat types, the small amount of loss of suitable habitat and potential for slight displacement associated with construction and operation of Wheatridge East are not expected to constitute a significant adverse effect to grasshopper sparrow.

Laurent's milkvetch: A single population of Laurent's milkvetch (a federal Species of Concern and an Oregon Department of Agriculture Threatened Species) was located during surveys associated with Wheatridge East. The proposed facilities pose no risk to this species because facilities will be sited to avoid this population.

4) "What are the potential risks of adverse impacts of the proposed [Wheatridge East] wind energy project to individuals and local populations of species of concern and their habitats? In the case of rare or endangered species, what are the possible impacts to such species and their habitats?"

Washington ground squirrel: Construction and operation of facilities may entail a loss of potentially suitable Washington ground squirrel breeding and foraging habitat (not currently occupied). Individuals may be at risk of being injured or killed by Project vehicles.

White-tailed jackrabbit: Construction and operation of facilities may entail a loss of suitable breeding and foraging habitat for this species. Individuals may be at risk of being injured or killed by Project vehicles.

Hoary bat: The potential adverse effect to this species is collision with turbines (Table 13), which is most likely during migration (August through October; Figure 13) and at wind speeds up to approximately 5 s^{-1} (Horn et al., 2008).

Silver-haired bat: The potential adverse effect to this species is collision with turbines (Table 13), which is most likely during migration (August through October; Figure 13) and at wind speeds up to approximately 5 s^{-1} (Horn et al., 2008).

Small-footed myotis: No significant adverse effects to this species are anticipated.

Mule deer: The potential adverse effect to mule deer is a further loss of suitable habitat, which is of greatest concern in the designated critical winter range (ODFW, 2013; Figure 2).

Concerns have been raised that construction and operation of wind energy facilities may result in the displacement of mule deer from remaining suitable habitat (WEST, 2010). The study from which this conclusion came did not control for a number of variables likely to have a greater among-year effect (than wind energy facilities) on mule deer distribution, and this concern is belied by abundant anecdotal evidence of this species' foraging, resting, and even calving in very close proximity to turbines, roads, and other facilities (see, e.g., Kronner et al., 2008b).

Greater Sandhill crane: No adverse effects to greater Sandhill crane are anticipated from construction and operation of the Project. Use of the area by this species was brief, and confined to the air space high above proposed facilities; the Project contains no habitat expected to attract individuals or flocks of this species, and no greater Sandhill cranes have been found as fatalities at CPE wind power projects (Table 11).

Ferruginous hawk: Potential adverse effects to ferruginous hawk are collision with moving rotors and disturbance by construction activities of active breeding attempts.

Swainson's hawk: Potential adverse effects to Swainson's hawk are collision with moving rotors and disturbance by construction activities of active breeding attempts.

Golden eagle: The potential adverse effect to golden eagle is collision with moving rotors. In the case of Wheatridge East, the risk of collision is likely to be associated not with breeding resident adults or fledglings from the nearest territories but with migrant eagles, especially during winter months and in rare years of high densities of other raptors (because of high densities of voles).

Peregrine falcon: The potential adverse effect to peregrine falcon is collision with moving rotors. The risk to this species is deemed to be seasonal and very low.

Burrowing owl: Potential adverse effects to burrowing owls are loss of suitable habitat, disturbance of active breeding attempts during construction, and possible displacement from suitable breeding and foraging habitat.

Long-billed curlew: Construction and operation of facilities may entail a loss of suitable breeding and foraging habitat for this species. Long-billed curlews are susceptible to human disturbance during the breeding season, which can result in nest abandonment or disruption of brood-rearing (Dugger and Dugger, 2002); the construction of facilities may pose a risk to the success of active long-billed curlew breeding attempts if construction occurs during the breeding season.

Loggerhead shrike: The potential adverse effect to loggerhead shrike is habitat loss. As proposed, however, Wheatridge East facilities layout involves the loss of a maximum of 2.5 acres of Basin Big Sagebrush Shrub-steppe (Table 2b), the habitat type with which this species is most closely associated. No significant adverse effects to loggerhead shrike are anticipated.

Grasshopper sparrow: Construction and operation of facilities may entail a loss of suitable breeding and foraging habitat for grasshopper sparrow. In addition, studies have indicated that this species may be displaced from suitable breeding habitat by the construction and operation of wind energy facilities (NWC and WEST, 2007; Johnson and Shaffer, 2008).

Laurent's milkvetch: Adverse effects to Laurent's milkvetch were avoided by the siting of proposed facilities outside of areas of occurrence of this species. No adverse effects to this species are anticipated.

5) "How can developers mitigate identified significant adverse impacts?"

Washington ground squirrel: Facilities were sited to avoid direct adverse effects to Washington ground squirrel. Locations of burrows where ground squirrels were detected (or the outlying burrows for larger colonies) were used for designating Category 1 habitat around these areas of use in accordance with Oregon Administrative Rule (OAR) 635-415-

0025. Subsequent micrositing of Project facilities was designed to avoid this Category 1 habitat. It is expected that the operator will have a wildlife biologist on hand for construction monitoring that will include ensuring that Washington ground squirrels have not expanded from the areas where they were documented into areas where facilities are being constructed.

The Applicant has minimized loss of potential suitable habitat (not currently occupied) by siting facilities as much as possible in non-suitable or developed habitats. Loss of potential suitable habitat will be mitigated at appropriate levels that are based on calculated acres of temporary and permanent losses and assessment of habitat categorization (Sec. 5.2.1; Table 2b) as a provision of the Habitat Mitigation Plan, draft concepts for which will accompany the Application for Site Certificate.

White-tailed jackrabbit: The Applicant has minimized loss of suitable habitat by siting facilities as much as possible in developed (Dryland Wheat) habitat. Loss of suitable white-tailed jackrabbit habitat will be mitigated at appropriate levels that are based on calculated acres of temporary and permanent losses and assessment of habitat categorization (Sec. 5.2.1; Table 2b) as a provision of the Habitat Mitigation Plan, draft concepts for which will accompany the Application for Site Certificate.

Hoary bat: The Applicant has minimized both loss of habitat for and potential for collision by hoary bats by siting the Project far from this species' forest habitat and by micrositing Project facilities as much as possible in developed (Dryland Wheat) habitat.

Silver-haired bat: The Applicant has minimized both loss of habitat for and potential for collision by silver-haired bats by siting the Project far from this species' forest habitat and by micrositing Project facilities as much as possible in developed (Dryland Wheat) habitat.

Small-footed myotis: No significant adverse effects to this species are anticipated.

Mule deer: The Applicant has minimized loss of suitable mule deer habitat by siting facilities as much as possible in developed (Dryland Wheat) habitat. Loss of suitable mule deer habitat will be mitigated at appropriate levels that are based on calculated acres of temporary and permanent losses and assessment of habitat categorization (Sec. 5.2.1; Table 2b) as a provision of the Habitat Mitigation Plan, draft concepts for which will accompany the Application for Site Certificate. Within the small amount of designated mule deer winter range (Figure 2), mitigation acres will exceed acres of loss.

Ferruginous hawk: The Applicant has minimized risk of ferruginous hawk collision by siting turbines as much as possible in disturbed habitats. In addition, the Applicant has utilized the raptor nest data to site turbines as far from known nests as possible. The operator can further minimize potential disturbance to any active ferruginous hawk breeding attempts (identified by the wildlife biologist conducting pre-construction and construction monitoring during the spring of construction) by restricting the construction of any Project facilities within close proximity of those active nests to outside the ferruginous hawk breeding season (February through July).

Swainson's hawk: The Applicant has minimized risk of Swainson's hawk collision by siting turbines as much as possible in disturbed habitats. In addition, the Applicant has utilized the raptor nest data to site turbines as far from known nests as possible. The operator can further minimize potential disturbance to any active Swainson's hawk breeding attempts (identified by the wildlife biologist conducting pre-construction and construction monitoring during the spring of construction) by restricting the construction of any Project facilities

within close proximity of those active nests to outside the Swainson's hawk breeding season (April through August).

Golden eagle: The Applicant has minimized risk of golden eagle collision by siting turbines in disturbed habitat. In addition, the applicant has sited turbines as far from known nests as possible, having first undertaken four years of golden eagle nest survey and monitoring and three years of telemetry studies at the nearest active nest. All proposed turbines at Wheatridge East are more than four miles from identified golden eagle nests.

Peregrine falcon: The Applicant has minimized risk of golden eagle collision by siting turbines in disturbed (Dryland Wheat) habitat as much as possible.

Burrowing owl: The Applicant has minimized potential displacement of burrowing owls and loss of suitable habitat by siting turbines in disturbed habitat. In addition, the Applicant has utilized these baseline study data to site turbines as far from identified nests as possible. The operator can further minimize potential disturbance to burrowing owl breeding attempts by restricting the construction of Project facilities to outside the burrowing owl breeding season (February through July) wherever facilities are within close proximity of dens identified as active (by the wildlife biologist conducting construction monitoring) during the spring of construction. Loss of suitable denning and hunting habitat will be mitigated at appropriate levels that are based on calculated acres of temporary and permanent losses and assessment of habitat categorization (Sec. 5.1.1; Table 2a) as a provision of the Habitat Mitigation Plan, draft concepts for which will accompany the Application for Site Certificate.

Long-billed curlew: The Applicant has minimized loss of suitable long-billed curlew breeding and foraging habitat by siting facilities in developed habitat wherever possible. The operator can further minimize potential disturbance to long-billed curlew breeding attempts by restricting the construction of Project facilities to outside the curlew breeding season (March through July) wherever facilities are within close proximity of nests identified as active (by the wildlife biologist conducting construction monitoring) during the spring of construction. Loss of suitable breeding and foraging habitat will be mitigated at appropriate levels that are based on calculated acres of temporary and permanent losses and assessment of habitat categorization (Sec. 5.1.1; Table 2a) as a provision of the Habitat Mitigation Plan, draft concepts for which will accompany the Application for Site Certificate.

Loggerhead shrike: The Applicant has minimized loss of suitable loggerhead shrike habitat by siting facilities in developed habitat wherever possible. Facilities are proposed in a maximum of 2.5 acres of the Basin Big Sagebrush Shrub-steppe habitat with which loggerhead shrike is associated (Table 2b). No significant adverse effects to this species are anticipated from construction and operation of Wheatridge East.

Grasshopper sparrow: The Applicant has minimized the potential for displacement of grasshopper sparrows and loss of suitable habitat by siting facilities as much as possible in disturbed habitats. Loss of suitable grasshopper sparrow breeding and foraging habitat will be mitigated at appropriate levels that are based on calculated acres of temporary and permanent losses and assessment of habitat categorization (Sec. 5.2.1; Table 2b) as a provision of the Habitat Mitigation Plan, draft concepts for which will accompany the Application for Site Certificate.

In summary, potential adverse effects of the proposed Wheatridge East Wind Energy Facility to species of concern include loss of small amounts of potential suitable habitat (Washington ground squirrel, white-tailed jackrabbit, mule deer, long-billed curlew, loggerhead shrike,

and grasshopper sparrow), risk of collision with turbine rotors (hoary bat, silver-haired bat, Swainson's hawk, ferruginous hawk, golden eagle, and peregrine falcon), and disturbance of breeding attempts by construction activities (avian species of concern, primarily Swainson's hawk, ferruginous hawk, and burrowing owl). Besides avoidance and minimization efforts associated with the micrositing of facilities, the following avoidance, minimization, and mitigation procedures either are already in place or are recommended:

- Mitigation for temporary and permanent loss of habitat for all species will be provided through the Habitat Mitigation Plan as a condition of the Site Certificate.
- Disturbance of breeding attempts should be avoided by limiting construction activities to outside the breeding season where facilities are planned within close proximity to nests identified as active during the spring of construction; it is anticipated that standard seasonal construction buffers may be applied as a condition of the Site Certificate. Breeding seasons (for species of concern nesting near Wheatridge West) are:
    - Ferruginous hawk: February through July;
    - Swainson's hawk: April through August;
    - Burrowing owl: February through July.
- It is anticipated that the speed limits established for Project roads as a condition of the Site Certificate will be such as to avoid the risk of vehicle-caused fatalities of Washington ground squirrel, white-tailed jackrabbit, and mule deer.

6) "Are there studies that should be initiated at this stage that would be continued in post-construction?"

All of the preconstruction surveys conducted at Wheatridge East and the surrounding area are amenable to being repeated or continued during the operational phase of the Project; the question becomes whether a particular study is warranted.

The purpose of conducting Washington ground squirrel surveys was to allow the Applicant to avoid any adverse impacts to this species. The Project was sited to avoid both all areas being used by WGS and large areas of potential suitable habitat (not being used) around those use areas. In addition—and despite having avoided adverse impacts—the operator will be expected to mitigate for loss of potentially suitable habitat (not being used by this species and not adjacent to areas of use) as outlined in the Habitat Mitigation Plan that will be a condition of the Site Certificate. Therefore, whereas allowing or participating in future WGS surveys within the Project area may be helpful for the agencies tasked with monitoring this species, requiring the Applicant, operator, or landowners to conduct or pay for such surveys would seem to be contradictory to the process that has been established to achieve avoidance and that has been followed on this Project.

Potential adverse effects to other species of concern have been or will be avoided, minimized, and/or adequately mitigated, so that significant adverse effects of any kind are not expected and discernible adverse effects are extremely unlikely. For one or more of the raptor species of concern, however, potential adverse effects cannot be completely avoided, and actual effects to the local breeding population could best be assessed by a subsequent survey of breeding numbers (active nests) following protocols used prior to construction. Given the number of wind energy facilities that have been developed within the Columbia Plateau of Oregon, most of them with some level of pre- and post-construction raptor nest survey completed, it is likely that the data are already available to determine whether significant changes in breeding numbers of these species are occurring across the region. More problematic is assigning causation to any such changes, with the construction and operation of wind turbines being just one of many factors affecting raptor breeding populations. Nonetheless, should fatality monitoring at Wheatridge East identify a potential

problem for locally breeding raptors, the preconstruction raptor survey could be replicated during the operational phase of the Project.

As with these raptor species of concern, potential adverse effects to hoary bat and silver-haired bat cannot be completely avoided. For bats, however, acoustic inventory methods do not yield an assessment of numbers or densities, but only of species presence. The preconstruction acoustic bat inventory is repeatable, and similar surveys could be conducted periodically during the years of operation of Wheatridge East (as to assess continued presence near the Project of these species of concern). Repetition of such studies will not, however, allow for quantitative comparisons of bat numbers pre- and post-construction.

5.3 Transmission Intraconnection Corridor

5.3.1 Wildlife Habitat Loss by Type and Category

Impacts to wildlife habitat include both temporary and permanent habitat loss. Habitat loss and various levels of habitat alteration and disturbance occur mainly during construction. Temporary impacts will be restored as required in the Permit Conditions. Permanent impacts are those where Project facilities are located for the life of the Project or where complete restoration of temporarily impacted habitats may not be attainable. Mature sagebrush shrubs in Shrub-steppe habitat may not be restored to the pre-construction structural stage for an extensive time-period (20–30 years or more). Table 2c delineates the acreages of habitat loss—temporary and permanent—expected under each of two options for the Transmission Intraconnection Corridor.

No temporary or permanent habitat loss will occur in Category 1 habitats.

The longer option entails the permanent loss of 0.3 acres and the temporary loss of an additional 122.2 acres (Table 2c). The majority of the temporary habitat loss (61%) will be in Category 3 habitats, Revegetated/Other Planted Grassland, Native Perennial Grassland, and Rabbitbrush/Snakeweed Shrub-steppe. Category 6 habitats (mainly Dryland Wheat) comprise 34%, and Category 4 Exotic Annual Grassland comprises 5% of temporary habitat loss.

The shorter option entails the permanent loss of 0.3 acres and the temporary loss of an additional 109.6 acres (Table 2c). The majority of the temporary habitat loss (65%) will be in Category 3 habitats, Revegetated/Other Planted Grassland, Native Perennial Grassland, and Rabbitbrush/Snakeweed Shrub-steppe. Category 6 habitats (mainly Dryland Wheat) comprise 30%, and Category 4 Exotic Annual Grassland comprises 5% of temporary habitat loss.

Permanent loss of Category 2, Category 3, and Category 4 habitats will be mitigated for under the Project's Habitat Mitigation Plan. For that purpose, all impacts occurring within designated deer winter range (ODFW, 2013) are deemed to require the level of mitigation appropriate for Category 2 habitat (more than 1 acre of mitigation for every acre of permanent loss) without regard for habitat type and quality (except that Category 6 habitats are excluded from this delineation). Acreages of habitat impacts are also calculated under this scheme in Table 2c.

5.3.2 Answers to Tier 3 Questions

1) "Do field studies indicate that species of concern are present on or likely to use the proposed [Intraconnection Corridor]?"

Field studies indicated the presence of several species of concern. These were Washington ground squirrel, white-tailed jackrabbit, hoary bat, silver-haired bat, California myotis, small-footed myotis, long-eared myotis, long-legged myotis, Swainson's hawk, ferruginous hawk, golden eagle, long-billed curlew, burrowing owl, and grasshopper sparrow. Mule deer, a common species with no special status but nonetheless of management concern to ODFW, was also present.

2) "Do field studies indicate the potential for significant adverse impacts on affected populations of species of habitat fragmentation concern?"

Washington ground squirrel: Habitat fragmentation has been identified as a potential concern for populations of this species. In the case of the transmission Intraconnection Corridor, however, further habitat fragmentation is not expected to occur. As discussed below, Project facilities were microsited to avoid ground squirrel colonies and adjacent suitable habitat. In addition, the facilities themselves (even were they placed within potential suitable habitat) are not deemed to constitute a barrier to dispersal by individuals of this species.

3) "What is the distribution, relative abundance, behavior, and site use of species of concern identified in Tiers 1 or 2, and to what extent do these factors expose these species to risk from the proposed [Intraconnection Line]?"

Washington ground squirrel: Washington ground squirrel (a federal Candidate Species and a State of Oregon Endangered Species) is found in a few locations along the eastern half of the area surveyed for the transmission Intraconnection Corridor (Sec. 4.10.1; Figure 9a). Avoidance measures (discussed above and below) will result in very low risk to this species from the proposed Project. Loss of potentially suitable habitat will be confined to areas not currently occupied and areas at distances greater than 785 feet from habitat currently occupied by Washington ground squirrels. Project roads will be far from existing areas of use, and speed limits that will be established for Project roads—and that will apply during construction and throughout Project operation—will be such as to minimize the possibility of long-distance dispersers of this species being hit by vehicles.

White-tailed jackrabbit: Detections of white-tailed jackrabbit (a State of Oregon Sensitive-Vulnerable species) were narrowly distributed (Sec. 4.10.3, Figure 11c), although seemingly suitable habitat is broadly distributed across the transmission Intraconnection Corridor. White-tailed jackrabbits are not likely to be at risk from construction or operation of the proposed transmission Intraconnection Corridor. This species does not seem to be displaced permanently by the construction of such facilities, as it is frequently observed near turbines and roads at operational wind farms. The speed limits that will be established for Project roads—and that will apply during construction and throughout Project operation—will be such as to minimize the possibility of vehicular collision.

Hoary bat: Currently-available survey methods cannot be used for estimating bat abundance. Nonetheless, the detection of hoary bat (a State of Oregon Sensitive-Vulnerable species) at one of the two acoustic monitoring sites (Sec. 4.11.3; tables 7 and 8; Figure 12c) confirms the occurrence of this species at the transmission Intraconnection Corridor during the late summer and fall months (its migration period). The Project does not provide suitable breeding habitat. The proposed facilities (transmission lines and associated temporary roads) do not pose a risk to this or any other bat species.

Silver-haired bat: Currently-available survey methods cannot be used for estimating bat abundance. Nonetheless, the detection of silver-haired bat (a federal Species of Concern

and a State of Oregon Sensitive-Vulnerable species) at both of the acoustic monitoring sites (Sec. 4.11.3; Tables 7 and 8; Figure 12c) confirms the occurrence of this species at the transmission Intraconnection Corridor during the late summer and fall months (its migration period). The Project does not provide suitable breeding habitat. The proposed facilities (transmission lines and associated temporary roads) do not pose a risk to this or any other bat species.

California myotis: Currently-available survey methods cannot be used for estimating bat abundance. Nonetheless, the detection of California myotis (a State of Oregon Sensitive-Vulnerable species) at one of the two acoustic monitoring sites (Sec. 4.11.3; Tables 7 and 8; Figure 12c) confirms the occurrence of this species at the transmission Intraconnection Corridor during the late summer and fall months. The Project likely provides some suitable breeding habitat, whereas suitable foraging habitat is likely more broadly distributed across the Project. The proposed facilities (transmission lines and associated temporary roads) do not pose a risk to this or any other bat species.

Small-footed myotis: Currently-available survey methods cannot be used for estimating bat abundance. Nonetheless, the detection of small-footed myotis (a federal Species of Concern) at both of the acoustic monitoring sites (Sec. 4.11.3; Tables 7 and 8; Figure 12c) confirms the occurrence of this species at the transmission Intraconnection Corridor during the late summer and fall months. The Project provides little suitable breeding habitat, whereas suitable foraging habitat is likely more broadly distributed across the Project. The proposed facilities (transmission lines and associated temporary roads) do not pose a risk to this or any other bat species.

Long-eared myotis: Currently-available survey methods cannot be used for estimating bat abundance. Nonetheless, the detection of long-eared myotis (a federal Species of Concern) at one of the two acoustic monitoring sites (Sec. 4.11.3; Tables 7 and 8; Figure 12c) confirms the occurrence of this species at the transmission Intraconnection Corridor during the late summer and fall months. The Project provides little or no suitable breeding habitat, but likely provides a small amount of suitable foraging habitat. The proposed facilities (transmission lines and associated temporary roads) do not pose a risk to this or any other bat species.

Long-legged myotis: Currently-available survey methods cannot be used for estimating bat abundance. Nonetheless, the detection of long-legged myotis (a federal Species of Concern and a State of Oregon Sensitive-Vulnerable species) at one of the two acoustic monitoring sites (Sec. 4.11.3; Tables 7 and 8; Figure 12c) confirms the occurrence of this species at the transmission Intraconnection Corridor Pathway during the late summer and fall months. The Project provides little or no suitable breeding habitat, but likely provides a small amount of suitable foraging habitat. The proposed facilities (transmission lines and associated temporary roads) do not pose a risk to this or any other bat species.

Mule deer: All of the transmission Intraconnection Corridor lies within designated critical winter range for mule deer, and is likely to provide foraging habitat throughout much of the year. Cover is very limited, however, and water scarce except where the Intraconnection Corridor crosses streams. Besides the riparian area associated with Little Butter Creek (which the proposed Intraconnection Line will cross perpendicularly), there are not expected to be any areas of mule deer concentration at any time of the year. The construction and operation of facilities (transmission lines and associated roads) are expected to result in the loss of some suitable mule deer habitat, for which mitigation will be required as a condition of the Site Certificate.

Ferruginous hawk: There were two breeding territories of ferruginous hawk (a federal Species of Concern and Bird of Conservation Concern and a State of Oregon Sensitive-Critical species) identified within the aerial raptor nest survey area for the transmission Intraconnection Corridor (Figure 7c). The proposed facilities (transmission lines and associated roads) do not pose a risk to ferruginous hawk; indeed, the transmission towers may provide additional opportunities for nesting (since suitable nest substrate is otherwise limited) and perches from which to hunt. The construction of facilities may pose a risk to active breeding attempts if construction occurs during the ferruginous hawk breeding season.

Swainson's hawk: There were 18 breeding territories of Swainson's hawk (a State of Oregon Sensitive-Vulnerable species) identified within the aerial raptor nest survey area for the transmission Intraconnection Corridor (Figure 7c). The proposed facilities (transmission lines and associated roads) do not pose a risk to Swainson's hawk; indeed, the transmission towers may provide additional perches from which to hunt. The construction of facilities may pose a risk to active breeding attempts if construction occurs during the Swainson's hawk breeding season.

Golden eagle: Avian use surveys were not conducted in association with the transmission Intraconnection Corridor. Except for the riparian area associated with Little Butter Creek, which the Intraconnection Line will cross perpendicularly, there are no areas where concentrations of golden eagle prey are expected. The proposed facilities (transmission lines and associated temporary roads) do not pose a risk to golden eagles, and the transmission towers may provide opportunities for nesting (since natural nesting substrates are limited in this area) and for perching and roosting.

Burrowing owl: Burrowing owl (a federal Species of Concern and a State of Oregon Sensitive-Critical species) was rare at the transmission Intraconnection Corridor; three occupied burrows (assumed to be active breeding dens) were documented during special status vertebrate wildlife species surveys (Sec. 4.10.2; Figure 7c). Proposed transmission towers may provide perching opportunities for larger raptors that prey upon burrowing owls. Nonetheless, burrowing owl is at low risk from the facilities associated with the proposed transmission Intraconnection Lines (based on low use of the Project area and the distance of facilities from identified nests).

Long-billed curlew: Long-billed curlew (a federal Bird of Conservation Concern and a State of Oregon Sensitive-Vulnerable species) is patchily distributed and relatively uncommon at the transmission Intraconnection Corridor. There were two detections during special status vertebrate wildlife species surveys (Section 4.10.3; Figure 11c). The proposed facilities (transmission lines and associated roads) do not pose a risk to long-billed curlew.

Grasshopper sparrow: Grasshopper sparrow (a State of Oregon Sensitive-Vulnerable species) is widely distributed across the transmission Intraconnection Corridor, is found in most habitat types, and is among the most abundant avian species during spring and early summer (Section 4.10.3; Figure 11c). The proposed facilities (transmission lines and associated roads) do not pose a risk to grasshopper sparrow. Because of this species' local and regional abundance and its ability to utilize a variety of habitat types, the small amount of loss of suitable habitat associated with construction and operation of the transmission Intraconnection Lines is not expected to constitute a significant adverse effect to grasshopper sparrow.

4) "What are the potential risks of adverse impacts of the proposed [Intraconnection Line] to individuals and local populations of species of concern and their habitats? In the case of

rare or endangered species, what are the possible impacts to such species and their habitats?"

Washington ground squirrel: Construction and operation of facilities may entail a loss of suitable breeding and foraging habitat for this species, and transmission towers may provide perching opportunities for raptor species that prey upon Washington ground squirrels.

White-tailed jackrabbit: Construction and operation of facilities may entail a loss of suitable breeding and foraging habitat for this species, and transmission towers may provide perching opportunities for large raptor species that prey upon white-tailed jackrabbits.

Hoary bat: There are no identified potential adverse effects to hoary bat associated with construction or operation of the proposed Intraconnection Lines.

Silver-haired bat: There are no identified potential adverse effects to silver-haired bat associated with construction or operation of the proposed Intraconnection Lines.

California myotis: There are no identified potential adverse effects to California myotis associated with construction or operation of the proposed Intraconnection Lines.

Small-footed myotis: There are no identified potential adverse effects to small-footed myotis associated with construction or operation of the proposed Intraconnection Lines.

Long-eared myotis: There are no identified potential adverse effects to long-eared myotis associated with construction or operation of the proposed Intraconnection Lines.

Long-legged myotis: There are no identified potential adverse effects to long-legged myotis associated with construction or operation of the proposed Intraconnection Line.

Mule deer: Construction and operation of facilities may entail a loss of suitable foraging habitat for mule deer, which is of special concern to ODFW within designated winter range (Figure 2).

Ferruginous hawk: The construction of facilities (Intraconnection Line and associated temporary roads) may pose a risk to the success of active ferruginous hawk breeding attempts if construction occurs during the breeding season. Transmission lines have historically entailed a risk of electrocution to ferruginous hawks and other raptors.

Swainson's hawk: The construction of facilities (Intraconnection Line and associated temporary roads) may pose a risk to the success of active Swainson's hawk breeding attempts if construction occurs during the breeding season. Transmission lines have historically entailed a risk of electrocution to Swainson's hawks and other raptors.

Golden eagle: Transmission lines have historically entailed a risk of electrocution to golden eagles and other raptors.

Burrowing owl: The construction of facilities (Intraconnection Line and associated temporary roads) may pose a risk to the success of active burrowing owl breeding attempts if construction occurs during the breeding season. Construction and operation of facilities may entail a loss of suitable breeding and hunting habitat for this species, and transmission towers may provide perching opportunities for larger raptor species that prey upon burrowing owls.

Long-billed curlew: Long-billed curlews are susceptible to human disturbance during the breeding season, which can result in nest abandonment or disruption of brood-rearing (Dugger and Dugger, 2002); the construction of facilities (Intraconnection Line and associated temporary roads) may pose a risk to the success of active long-billed curlew breeding attempts if construction occurs during the breeding season. Construction and operation of facilities may entail a loss of suitable breeding and foraging habitat for this species, and transmission towers may provide perching opportunities for raptor species that prey upon long-billed curlews.

Grasshopper sparrow: Construction and operation of facilities may entail a loss of suitable breeding and foraging habitat for grasshopper sparrow.

5) "How can developers mitigate identified significant adverse impacts?"

Washington ground squirrel: Facilities were sited to avoid direct adverse effects to Washington ground squirrel. Locations of burrows where ground squirrels were detected (or the outlying burrows for larger colonies) were used for designating Category 1 habitat around these areas of use in accordance with Oregon Administrative Rule (OAR) 635-415-0025. Subsequent micrositing of Project facilities was done to avoid this Category 1 habitat. The operator will be expected to have a wildlife biologist monitor identified areas of Washington ground squirrel use prior to and during construction of the Intraconnection Line(s) to ensure that individuals of this species have not dispersed into areas where facilities are being constructed.

Loss of potential suitable habitat (not currently occupied) will be mitigated at appropriate levels that are based on calculated acres of temporary and permanent losses and assessment of habitat categorization (Sec. 5.3.1; Table 2c) as a provision of the Habitat Mitigation Plan, draft concepts for which will accompany the Application for Site Certificate.

White-tailed jackrabbit: Loss of suitable white-tailed jackrabbit habitat will be mitigated at appropriate levels that are based on calculated acres of temporary and permanent losses and assessment of habitat categorization (Sec. 5.3.1; Table 2c) as a provision of the Habitat Mitigation Plan, draft concepts for which will accompany the Application for Site Certificate.

Mule deer: Loss of suitable mule deer habitat will be mitigated at appropriate levels that are based on calculated acres of temporary and permanent losses and assessment of habitat categorization (Sec. 5.3.1; Table 2c) as a provision of the Habitat Mitigation Plan, draft concepts for which will accompany the Application for Site Certificate. Within designated mule deer winter range (Figure 2), mitigation acres will exceed acres of loss.

Ferruginous hawk: The operator can minimize potential disturbance of active ferruginous hawk breeding attempts by restricting the construction of Project facilities to outside the ferruginous hawk breeding season (February through July) wherever facilities are within close proximity of nests identified (by the wildlife biologist conducting construction monitoring) as active during the spring of construction. The operator can minimize the risk of electrocution by constructing the Intraconnection Line according to the most current protection standards established by the Avian Powerline Interaction Committee (APLIC, 2006).

Swainson's hawk: The operator can minimize potential disturbance of active Swainson's hawk breeding attempts by restricting the construction of Project facilities to outside the Swainson's hawk breeding season (April through August) wherever facilities are within close proximity of nests identified (by the wildlife biologist conducting construction monitoring) as

active during the spring of construction. The operator can minimize the risk of electrocution by constructing the Intraconnection Line according to the most current protection standards established by the Avian Powerline Interaction Committee (APLIC, 2006).

Golden eagle: The operator can minimize the risk of electrocution of golden eagles by constructing the Intraconnection Line according to the most current protection standards established by the Avian Powerline Interaction Committee (APLIC, 2006).

Burrowing owl: The operator can minimize potential disturbance of active burrowing owl breeding attempts by restricting the construction of Project facilities to outside the burrowing owl breeding season (February through July) wherever facilities are within close proximity of dens identified (by the wildlife biologist conducting construction monitoring) as active during the spring of construction. Loss of suitable denning and hunting habitat will be mitigated at appropriate levels that are based on calculated acres of temporary and permanent losses and assessment of habitat categorization (Sec. 5.3.1; Table 2c) as a provision of the Habitat Mitigation Plan, draft concepts for which will accompany the Application for Site Certificate.

Long-billed curlew: The operator can minimize potential disturbance of active long-billed curlew breeding attempts by restricting the construction of Project facilities to outside the breeding season (March through July) wherever facilities are within close proximity of nests identified (by the wildlife biologist conducting construction monitoring) as active during the spring of construction. Loss of suitable breeding and foraging habitat will be mitigated at appropriate levels that are based on calculated acres of temporary and permanent losses and assessment of habitat categorization (Sec. 5.3.1; Table 2c) as a provision of the Habitat Mitigation Plan, draft concepts for which will accompany the Application for Site Certificate.

Grasshopper sparrow: Loss of suitable grasshopper sparrow breeding and foraging habitat will be mitigated at appropriate levels that are based on calculated acres of temporary and permanent losses and assessment of habitat categorization (Sec. 5.3.1; Table 2c) as a provision of the Habitat Mitigation Plan, draft concepts for which will accompany the Application for Site Certificate.

In summary, potential adverse effects of the proposed transmission Intraconnection Line to species of concern include loss of potential suitable habitat (Washington ground squirrel, white-tailed jackrabbit, mule deer, long-billed curlew, loggerhead shrike, and grasshopper sparrow), risk of electrocution (raptor species of concern), and disturbance of breeding attempts by construction activities (avian species of concern, primarily Swainson's hawk and ferruginous hawk). Besides avoidance and minimization efforts associated with the micrositing of facilities, the following avoidance, minimization, and mitigation procedures either are already in place or are recommended:

- Mitigation for temporary and permanent loss of habitat for all species will be provided through the Habitat Mitigation Plan as a condition of the Site Certificate.
- Disturbance of breeding attempts should be avoided by limiting construction activities to outside the breeding season where facilities are planned within close proximity to nests identified as active during the spring of construction; it is anticipated that standard seasonal construction buffers may be applied as a condition of the Site Certificate. Breeding seasons (for species of concern nesting near the proposed transmission Intraconnection Line) are:
    - Swainson's hawk: April through August;
    - Ferruginous hawk: February through July;
    - Burrowing owl: February through July.

- It is anticipated that the speed limits established for Project roads as a condition of the Site Certificate will be such as to avoid the risk of vehicle-caused fatalities of Washington ground squirrel, white-tailed jackrabbit, and mule deer.
- Design and construction of the proposed transmission lines will follow the most current protection standards (APLIC, 2006); this should be a condition of the Site Certificate.

6) "Are there studies that should be initiated at this stage that would be continued in post-construction?"

All of the preconstruction surveys conducted at Wheatridge West and the surrounding area are amenable to being repeated or continued during the operational phase of the Project. However, because the proposed facilities (transmission lines and associated temporary roads) pose no risk to species of concern other than the loss of small amounts of suitable habitat, no ongoing studies specific to the Intraconnection Corridor are warranted.

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8.0 Tables

Table 1. General land cover and specific wildlife habitat types found during surveys at the Wheatridge Wind Energy Facility.

General Land Cover Type and Code	Specific Habitat Type and Mapping Code	Specific Habitat Type Description*
Developed (D)	**Irrigated Agriculture (DI)**	Agricultural crop or livestock pasture fields that are irrigated for all or a portion of the growing season. Irrigated status was determined by presence of farm crop and onsite irrigation implements such as pipes, sprinklers, pumps, and motors.
	Revegetated or Other Planted Grassland (DR)	Planted grassland on previously farmed or other disturbed lands that may be enrolled in the Conservation Reserve Program. Residual (not previously plowed) native vegetation patches in a few locations. Old grass stands contain but are not dominated by rabbitbrush or other shrubs (see SSB below). May support white-tailed jackrabbits. Common species include western meadowlark and grasshopper sparrow where grassland is mature. This is an *Oregon Conservation Strategy Habitat*.
	Dryland Wheat or Other Small Grain (DW)	Agricultural fields currently in small grain production or fallow. Common species include horned lark and mourning dove in winter stubble or when fallow.
	Other (DX)	Developed or disturbed areas including farming/ranching home and shop sites, corrals, structures, feedlots, inactive and active gravel quarries, pastures, roads, right-of-ways and waste areas associated with on-going human activities. Not considered of significant value to native wildlife species.
Grassland (G) Steppe dominated by native and/or non-native grasses (<20% shrub cover)	**Exotic Annual Grassland (GA)**	Dominated by exotic annual grass and/or weeds. Open, low shrubs such as snakeweed are present in larger blocks. Some GA sites support long-billed curlew, Washington ground squirrel. Common bird species include horned lark. This is an *Oregon Conservation Strategy Habitat*.
	Native Perennial Grassland (GB)	Dominated by native perennial bunchgrass. Shrubs, if present, are an inconspicuous component. May support Washington ground squirrel, white-tailed jackrabbit, burrowing owl, depending on soil type and depth. Important nesting habitat for ground-nesting birds such as grasshopper sparrow, savannah sparrow, and vesper sparrow. Common bird species include horned lark and western meadowlark. This is an *Oregon Conservation Strategy Habitat*.

General Land Cover Type and Code	Specific Habitat Type and Mapping Code	Specific Habitat Type Description*
Exposed Rock (ER)	**Escarpment (ESC)**	Linear Columbia River Basalt outcroppings approximately 3 to 15 meters (10–50 feet) in height, found on steeper slopes which bound canyon edges and shoulders. Plant diversity and cover is very low on escarpments. Provides critical nesting substrate and perching sites for raptors and crevices for bats. May support Washington ground squirrels burrowing or foraging at the base of Escarpments where adjacent to typical habitat for this species. Provides shade and thermal cover for deer in summer and also serves as windbreak. May provide home sites for small mammals such as woodrats and marmots and for snakes, which in turn constitute prey for raptors.
Shrub-steppe (SS) Steppe dominated by shrubs (>20% shrub cover)	**Basin Big Sagebrush Shrub-steppe (SSA)**	Dominated by >20% cover of basin big sagebrush. Offers high quality breeding habitat for shrub obligate species including loggerhead shrike. May also support Washington ground squirrel and white-tailed jackrabbit. Common species include western meadowlark and mourning dove. Brewer's sparrow, lark sparrow, and sagebrush sparrow are present in larger blocks. In the sandier soils, sagebrush lizard and other reptiles are likely to be found. Sagebrush Shrub-steppe is an *Oregon Conservation Strategy Habitat*.
	Rabbitbrush / Snakeweed Shrub-steppe (SSB)	Dominated by >20% cover of green and gray rabbitbrush and broom snakeweed. Most of these areas are formerly SSA that have experienced recent fire. Some sites contain mature big sagebrush cover in patches approx. 2 acres and less in size. Can support long-billed curlew, white-tailed jackrabbit, and Washington ground squirrel. Common species include horned lark and western meadowlark. Lark sparrow occasional found nesting.

* refer to Section 4.2 of this report for more detailed descriptions and wildlife use

Table 2a. Impacts by habitat category and type within Wheatridge West site boundary, maximum and minimum layouts. (Values in parentheses are those that differ when assigning Category 2 to lands that lie within ODFW deer winter range; see Sections 3.2 and *5.1.1*; ODFW, 2013.)

Category and Habitat Description	Habitat Type Code	Impacts (acres)			
		Maximum Layout		Minimum Layout	
		Temporary	Permanent	Temporary	Permanent
Category 2					
Developed – Revegetated/Other Planted Grassland	DR	0.0 (91.5)	0.0 (14.5)	0.0 (91.6)	0.0 (12.7)
Grassland – Exotic Annual	GA	0.0 (12.5)	0.0 (1.4)	0.0 (6.8)	0.0 (0.5)
Grassland – Native Perennial	GB	0.0 (31.8)	0.0 (5.4)	0.0 (34.1)	0.0 (4.6)
Shrub-steppe – Basin Big Sagebrush	SSA	2.5	0.8	2.4	0.8
Total		**2.5** (138.3)	**0.8** (22.1)	**2.4** (134.9)	**0.8** (18.6)
Category 3					
Developed – Revegetated/Other Planted Grassland	DR	167.6 (76.1)	25.0 (10.5)	167.4 (75.8)	22.2 (9.4)
Grassland – Native Perennial	GB	61.1 (29.3)	11.0 (5.6)	60.7 (26.6)	9.3 (4.7)
Shrub-steppe – Rabbitbrush/Snakeweed	SSB	2.5	0.0	2.0	0.0
Total		**231.2** (107.9)	**36.0** (16.1)	**230.1** (104.4)	**31.5** (14.1)
Category 4					
Grassland – Exotic Annual	GA	24.9 (12.4)	3.5 (2.1)	19.1 (12.3)	2.5 (2.0)
Total		**24.9** (12.4)	**3.5** (2.1)	**19.1** (12.3)	**2.5** (2.0)
Subtotal for Cat. 2, 3, 4		**258.6**	**40.3**	**251.6**	**34.8**
Category 6					
Developed – Dryland Wheat	DW	487.0	82.3	435.5	67.6
Developed – Other	DX	1.0	0.3	0.9	0.3
Total		**488.0**	**82.6**	**436.4**	**67.9**
Total for all Categories		**746.6**	**122.9**	**688.1**	**102.6**

Temporary facilities include access roads, construction areas, access for overhead line construction, installation sites for underground collector cables, and equipment laydown areas for individual turbines, entire strings of turbines, and laydown areas for in-transit towers, cranes, and miscellaneous construction equipment.

Permanent facilities include turbine pads and towers, substation, meteorological towers, Operations and Maintenance facility or facilities, and permanent access roads.

Table 2b. Impacts by habitat category and type within Wheatridge East site boundary, maximum and minimum layouts. (Values in parentheses are those that differ when assigning Category 2 to lands that lie within ODFW deer winter range; see Sections 3.2 and *5.2.1*; ODFW, 2013.)

Category and Habitat Description	Habitat Type Code	Impacts (acres)			
		Maximum Layout		Minimum Layout	
		Temporary	Permanent	Temporary	Permanent
Category 2					
Grassland – Exotic Annual	GA	0.0 (0.8)	0.0	0.0 (1.3)	0.0 (0.4)
Grassland – Native Perennial	GB	0.0 (2.3)	0.0 (0.4)	0.0 (2.2)	0.0 (0.4)
Total		**0.0** (3.1)	**0.0** (0.4)	**0.0** (3.5)	**0.0** (0.8)
Category 3					
Grassland – Native Perennial	GB	33.8 (31.6)	4.6 (4.1)	34.9 (32.7)	4.4 (4.0)
Shrub-steppe – Rabbitbrush/Snakeweed	SSB	12.1	1.9	12.7	1.6
Total		**45.9** (43.7)	**6.5** (6.0)	**47.6** (45.4)	**6.0** (5.6)
Category 4					
Grassland – Exotic Annual	GA	25.1 (24.3)	4.6	23.8 (22.5)	4.2
Grassland – Native Perennial	GB	1.2	0.2	1.5	0.3
Shrub-steppe – Rabbitbrush/Snakeweed	SSB	2.7	0.3	1.4	0.3
Total		**28.9** (28.1)	**5.0**	**26.6** (25.3)	**4.7**
Subtotal for Cat. 2, 3, 4		**74.8**	**11.5**	**74.2**	**10.7**
Category 6					
Developed – Dryland Wheat	DW	171.0	29.9	176.3	27.7
Total		**171.0**	**29.9**	**176.3**	**27.7**
Total for all Categories		**245.8**	**41.4**	**250.5**	**38.4**

Temporary facilities include access roads, construction areas, access for overhead line construction, installation sites for underground collector cables, and equipment laydown areas for individual turbines, entire strings of turbines, and laydown areas for in-transit towers, cranes, and miscellaneous construction equipment.

Permanent facilities include turbine pads and towers, substation, meteorological towers, Operations and Maintenance facility or facilities, and permanent access roads.

Table 2c. Impacts by habitat category and type within Wheatridge Transmission Intraconnection Corridor, longer and shorter options. (Values in parentheses are those that differ when assigning Category 2 to lands that lie within ODFW deer winter range; see Sections 3.2 and *5.3.1*; ODFW, 2013.)

Category and Habitat Description	Habitat Type Code	Impacts (acres)			
		Longer Option		Shorter Option	
		Temporary	Permanent	Temporary	Permanent
Category 2					
Developed – Revegetated/Other Planted Grassland	DR	0.0 (11.9)	0.0	0.0 (11.9)	0.0
Grassland – Exotic Annual	GA	0.0 (1.7)	0.0	0.0 (1.7)	0.0
Grassland – Native Perennial	GB	0.0 (35.7)	0.0 (0.1)	0.0 (35.7)	0.0 (0.1)
Shrub-steppe – Basin Big Sagebrush	SSA	0.0 (0.7)	0.0	0.0 (0.7)	0.0
Shrub-steppe – Rabbitbrush/Snakeweed	SSB	0.0 (10.7)	0.0	0.0 (10.7)	0.0
Total		**0.0** (60.7)	**0.0** (0.1)	**0.0** (60.7)	**0.0** (0.1)
Category 3					
Developed – Revegetated/Other Planted Grassland	DR	19.1 (7.2)	0.0	15.1 (3.2)	0.0
Grassland – Native Perennial	GB	43.2 (7.4)	0.1 (0.0)	43.2 (7.4)	0.1 (0.0)
Shrub-steppe – Basin Big Sagebrush	SSA	1.1 (0.4)	0.0	0.7 (0.0)	0.0
Shrub-steppe – Rabbitbrush/Snakeweed	SSB	11.7 (1.0)	0.0	11.7 (1.0)	0.0
Total		**75.1** (16.0)	**0.1** (0.0)	**70.7** (11.6)	**0.1** (0.0)
Category 4					
Grassland – Exotic Annual	GA	5.7 (4.0)	0.0	5.7 (4.0)	0.0
Total		**5.7** (4.0)	**0.0**	**5.7** (4.0)	**0.0**
Subtotal for Cat. 2, 3, 4		**80.8**	**0.1**	**76.4**	**0.1**
Category 6					
Developed – Dryland Wheat	DW	40.3	0.1	32.1	0.1
Developed – Irrigated Agriculture	DI	0.8	0.0	0.8	0.0
Developed – Other	DX	0.4	0.0	0.3	0.0
Total		**41.5**	**0.1**	**33.2**	**0.1**
Total for all Categories		**122.2**	**0.3**	**109.6**	**0.3**

Table 3a. Avian species observed within 800 m study plots on the Wheatridge West portion of the Wheatridge Wind Energy Facility avian use study, February 2011 through February 2012.

Species	Winter[1] (299 surveys)		Spring[2] (176 surveys)		Summer[3] (173 surveys)		Fall[4] (175 surveys)		Total	
	# Grp	# Ind	# Grp	# Ind	# Grp	# Ind	# Grp	# Ind	# Grp	# Ind
Waterfowl		**26**		**2**		**0**		**0**		**28**
Canada goose	0	0	1	2	0	0	0	0	1	2
Tundra swan	2	26	0	0	0	0	0	0	2	26
Gamebirds		**0**		**6**		**5**		**20**		**31**
Chukar	0	0	0	0	0	0	2	12	2	12
Ring-necked pheasant	0	0	5	6	5	5	2	8	12	19
Wading bird		**0**		**0**		**1**		**0**		**1**
Great blue heron	0	0	0	0	1	1	0	0	1	1
Raptors		**815**		**339**		**271**		**422**		**1847**
Vulture		*0*		*0*		*1*		*0*		*1*
Turkey vulture	0	0	0	0	1	1	0	0	1	1
Eagles		*15*		*2*		*3*		*13*		*33*
Bald eagle	4	4	0	0	0	0	0	0	4	4
Golden eagle	11	11	2	2	3	3	13	13	29	29
Harrier		*266*		*80*		*49*		*132*		*527*
Northern harrier	261	266	76	80	47	49	119	132	503	527
Accipiters		*1*		*1*		*0*		*6*		*8*
Sharp-shinned hawk	1	1	1	1	0	0	3	3	5	5
Cooper's hawk	0	0	0	0	0	0	1	1	1	1
Unidentified accipiter	0	0	0	0	0	0	2	2	2	2
Buteos		*500*		*252*		*193*		*239*		*1184*
Swainson's hawk	0	0	71	77	100	114	37	43	208	234
Red-tailed hawk	76	78	20	20	59	61	117	133	272	292
Ferruginous hawk	3	3	12	13	10	10	5	5	30	31
Rough-legged hawk	384	401	133	139	0	0	41	42	558	582
Unidentified buteo	12	18	3	3	8	8	16	16	39	45
Owls		*4*		*0*		*9*		*3*		*16*
Burrowing owl	0	0	0	0	0	0	1	1	1	1
Short-eared owl	3	4	0	0	5	9	2	2	10	15
Falcons		*29*		*4*		*16*		*28*		*77*
American kestrel	15	15	4	4	12	14	21	23	52	56
Merlin	1	1	0	0	0	0	0	0	1	1
Prairie falcon	13	13	0	0	1	1	4	4	18	18
Unidentified falcon	0	0	0	0	1	1	1	1	2	2

Species	Winter[1] (299 surveys)		Spring[2] (176 surveys)		Summer[3] (173 surveys)		Fall[4] (175 surveys)		Total	
	# Grp	# Ind	# Grp	# Ind	# Grp	# Ind	# Grp	# Ind	# Grp	# Ind
Other raptors		*0*		*0*		*0*		*1*		*1*
Unidentified raptor	0	0	0	0	0	0	1	1	1	1
Crane		**5**		**130**		**0**		**70**		**205**
Greater Sandhill crane	1	5	4	130	0	0	1	70	6	205
Shorebirds		**0**		**45**		**10**		**0**		**55**
Killdeer	0	0	0	0	1	1	0	0	1	1
Long-billed curlew	0	0	33	45	6	9	0	0	39	54
Gull		**0**		**36**		**7**		**0**		**43**
Unidentified gull	0	0	3	36	1	7	0	0	4	43
Doves		**207**		**17**		**21**		**18**		**263**
Rock pigeon	9	205	5	16	4	12	4	17	22	250
Eurasian-collared dove	1	2	0	0	1	1	1	1	3	4
Mourning dove	0	0	1	1	5	8	0	0	6	9
Goatsucker		**0**		**0**		**1**		**0**		**1**
Common nighthawk	0	0	0	0	1	1	0	0	1	1
Hummingbird		**0**		**1**		**0**		**0**		**1**
Unidentified hummingbird	0	0	1	1	0	0	0	0	1	1
Woodpecker		**0**		**0**		**0**		**3**		**3**
Northern flicker	0	0	0	0	0	0	2	3	2	3
Passerines		**3403**		**1621**		**1177**		**1670**		**7871**
Songbirds		*3191*		*1490*		*1082*		*1519*		*7282*
Western kingbird	0	0	2	3	8	14	1	3	11	20
Eastern kingbird	0	0	0	0	1	1	0	0	1	1
Horned lark	243	2954	161	1068	132	783	139	1287	675	6092
Loggerhead shrike	2	2	2	3	1	1	2	2	7	8
Northern shrike	1	1	0	0	0	0	0	0	1	1
Violet-green swallow	0	0	0	0	0	0	1	1	1	1
Northern rough-winged swallow	0	0	0	0	1	1	0	0	1	1
Barn swallow	0	0	4	6	8	14	5	16	17	36
Unidentified swallow	0	0	0	0	0	0	1	1	1	1
Rock wren	0	0	1	2	0	0	0	0	1	2
Mountain bluebird	0	0	2	4	0	0	0	0	2	4
American robin	3	20	0	0	0	0	0	0	3	20
European starling	6	69	9	12	4	7	4	22	23	110
American pipit	0	0	0	0	0	0	8	31	8	31
Lapland longspur	0	0	0	0	0	0	1	2	1	2
Chipping sparrow	0	0	2	2	0	0	0	0	2	2
Savannah sparrow	0	0	17	28	17	34	1	3	35	65

Species	Winter[1] (299 surveys)		Spring[2] (176 surveys)		Summer[3] (173 surveys)		Fall[4] (175 surveys)		Total	
	# Grp	# Ind	# Grp	# Ind	# Grp	# Ind	# Grp	# Ind	# Grp	# Ind
Grasshopper sparrow	0	0	10	17	15	18	0	0	25	35
White-crowned sparrow	0	0	4	10	0	0	0	0	4	10
Red-winged blackbird	0	0	0	0	0	0	1	2	1	2
Western meadowlark	44	133	127	320	73	177	49	114	293	744
Brewer's blackbird	0	0	3	7	2	11	0	0	5	18
Unidentified blackbird	0	0	0	0	1	1	0	0	1	1
Bullock's oriole	0	0	1	1	0	0	0	0	1	1
House finch	0	0	2	7	3	8	0	0	5	15
House sparrow	0	0	0	0	2	7	0	0	2	7
Unidentified passerine	2	12	0	0	3	5	2	35	7	52
Corvids		*212*		*131*		*95*		*151*		*589*
Black-billed magpie	3	4	1	1	0	0	1	1	5	6
Common raven	94	208	63	130	38	95	58	150	253	583
Totals	**1195**	**4456**	**786**	**2197**	**581**	**1493**	**670**	**2203**	**3232**	**10349**

Seasons:

[1] Winter - February 2 through March 8, 2011 and November 2, 2011 through February 6, 2012; 19 visits to 7 sites (H-N), 20 visits to 2 sites (O,P),18 visits to 7 sites (A-G) = 299 surveys

[2] Spring - March 14 through May 26, 2011; 11 visits to 16 sites = 176 surveys

[3] Summer – June 1 through August 11, 2011; 11 visits to 13 sites, 10 visits to 3 sites (B,C,H)=173 surveys

[4] Fall - August 17 through October 28, 2011; 11 visits to 15 sites, 10 visits to 1 site (I) = 175 surveys

Table 3b. Avian species observed within 800 m study plots on the Wheatridge East portion of the Wheatridge Wind Energy Project avian use study, February 2011 through February 2012.

Species	Winter[1] (144 surveys)		Spring[2] (86 surveys)		Summer[3] (88 surveys)		Fall[4] (88 surveys)		Total	
	# Grp	# Ind	# Grp	# Ind	# Grp	# Ind	# Grp	# Ind	# Grp	# Ind
Gamebirds		**0**		**2**		**25**		**2**		**29**
Chukar	0	0	0	0	1	2	0	0	1	2
Gray partridge	0	0	1	2	2	23	1	2	4	27
Raptors		**95**		**78**		**43**		**22**		**238**
Eagle		*17*		*1*		*0*	*0*	*0*		*18*
Golden eagle	17	17	1	1	0	0	0	0	18	18
Harrier	*30*	*31*		*20*		*6*		*12*		*69*
Northern harrier		31	20	20	6	6	12	12	38	69
Accipiter		*0*		*0*		*0*		*1*		*1*
Cooper's hawk	0	0	0	0	0	0	1	1	1	1
Buteos		*41*		*52*		*31*		*9*		*133*
Swainson's hawk	0	0	4	4	13	16	2	2	19	22
Red-tailed hawk	6	6	15	19	10	11	5	5	36	41
Ferruginous hawk	2	2	5	8	3	3	2	2	12	15
Rough-legged hawk	28	33	18	20	0	0	0	0	46	53
Unidentified buteo	0	0	1	1	1	1	0	0	2	2
Falcons		*6*		*5*		*6*		*0*		*17*
American kestrel	2	2	2	2	3	3	0	0	7	7
Peregrine falcon	2	2	0	0	1	1	0	0	3	3
Prairie falcon	2	2	3	3	2	2	0	0	7	7
Crane		**0**		**0**		**0**		**134**		**134**
Greater Sandhill crane	0	0	0	0	0	0	2	134	2	134
Shorebirds		**0**		**121**		**30**		**1**		**152**
Killdeer	0	0	0	0	0	0	1	1	1	1
Long-billed curlew	0	0	49	121	17	30	0	0	66	151
Dove		**0**		**0**		**10**		**0**		**10**
Mourning dove	0	0	0	0	3	10	0	0	3	10
Hummingbird		**0**		**1**		**0**		**0**		**1**
Unidentified hummingbird	0	0	1	1	0	0	0	0	1	1
Passerines		**2025**		**2414**		**1107**		**648**		**6194**
Songbirds		*1948*		*2354*		*1082*		*631*		*6015*
Say's phoebe	0	0	0	0	0	0	1	1	1	1
Western kingbird	0	0	0	0	1	1	0	0	1	1
Loggerhead shrike	0	0	1	1	0	0	0	0	1	1

Species	Winter[1] (144 surveys)		Spring[2] (86 surveys)		Summer[3] (88 surveys)		Fall[4] (88 surveys)		Total	
	# Grp	# Ind	# Grp	# Ind	# Grp	# Ind	# Grp	# Ind	# Grp	# Ind
Northern shrike	2	2	0	0	0	0	0	0	2	2
Horned lark	151	1713	83	1270	92	732	91	578	417	4293
Cliff swallow	0	0	13	98	8	29	0	0	21	127
Barn swallow	0	0	1	1	1	1	0	0	2	2
Unidentified swallow	0	0	2	43	2	5	0	0	4	48
Rock wren	0	0	0	0	1	1	0	0	1	1
American robin	2	2	0	0	0	0	0	0	2	2
European starling	1	3	7	362	0	0	1	7	9	372
American pipit	0	0	1	1	0	0	0	0	1	1
Savannah sparrow	0	0	3	4	2	2	1	3	6	9
Grasshopper sparrow	0	0	29	33	27	42	0	0	56	75
White-crowned sparrow	0	0	1	4	0	0	0	0	1	4
Western meadowlark	33	124	81	515	61	266	23	41	198	946
Brewer's blackbird	0	0	0	0	0	0	1	1	1	1
Gray-crowned rosy-finch	1	1	0	0	0	0	0	0	1	1
Cassin's finch	3	54	0	0	0	0	0	0	3	54
Unidentified finch	1	1	0	0	0	0	0	0	1	1
Unidentified passerine	6	48	5	22	3	3	0	0	14	73
Corvids		*77*		*60*		*25*		*17*		*179*
Black-billed magpie	1	1	0	0	0	0	0	0	1	1
American crow	0	0	1	1	0	0	0	0	1	1
Common raven	38	76	26	59	15	25	7	17	86	177
Totals	**328**	**2120**	**374**	**2616**	**275**	**1215**	**151**	**807**	**1128**	**6758**

Seasons:

[1] Winter - February 3 through March 7, 2011 and November 1, 2011 through January 26, 2012

[2] Spring - March 15 through May 23, 2011

[3] Summer - May 30 through August 12, 2011

[4] Fall - August 18 through October 27, 2011

Table 4a. Mean use, percent composition, and percent frequency of occurrence for avian groups observed during avian use surveys at Wheatridge West, February 2011 through February 2012.

Species	Winter 2011-12	Spring 2011	Summer 2011	Fall 2011
	Mean Use[1]			
Waterfowl	**0.087**	**0.011**	**0.000**	**0.000**
Canada goose	0.000	0.011	0.000	0.000
Tundra swan	0.087	0.000	0.000	0.000
Gamebirds	**0.000**	**0.034**	**0.029**	**0.114**
Chukar	0.000	0.000	0.000	0.069
Ring-necked pheasant	0.000	0.034	0.029	0.046
Wading bird	**0.000**	**0.000**	**0.006**	**0.000**
Great blue heron	0.000	0.000	0.006	0.000
Raptors	**2.726**	**1.926**	**1.566**	**2.411**
Vulture	*0.000*	*0.000*	*0.006*	*0.000*
Turkey vulture	0.000	0.000	0.006	0.000
Eagles	*0.050*	*0.011*	*0.017*	*0.074*
Bald eagle	0.013	0.000	0.000	0.000
Golden eagle	0.037	0.011	0.017	0.074
Harrier	*0.890*	*0.455*	*0.283*	*0.754*
Northern harrier	0.890	0.455	0.283	0.754
Accipiters	*0.003*	*0.006*	*0.000*	*0.034*
Sharp-shinned hawk	0.003	0.006	0.000	0.017
Cooper's hawk	0.000	0.000	0.000	0.006
Unidentified accipiter	0.000	0.000	0.000	0.011
Buteos	*1.672*	*1.432*	*1.116*	*1.366*
Swainson's hawk	0.000	0.438	0.659	0.246
Red-tailed hawk	0.261	0.114	0.353	0.760
Ferruginous hawk	0.010	0.074	0.058	0.029
Rough-legged hawk	1.341	0.790	0.000	0.240
Unidentified buteo	0.060	0.017	0.046	0.091
Owls	*0.013*	*0.000*	*0.052*	*0.017*
Burrowing owl	0.000	0.000	0.000	0.006
Short-eared owl	0.013	0.000	0.052	0.011
Falcons	*0.097*	*0.023*	*0.092*	*0.160*
American kestrel	0.050	0.023	0.081	0.131
Merlin	0.003	0.000	0.000	0.000
Prairie falcon	0.043	0.000	0.006	0.023
Unidentified falcon	0.000	0.000	0.006	0.006
Other raptors	*0.000*	*0.000*	*0.000*	*0.006*
Unidentified raptor	0.000	0.000	0.000	0.006
Crane	**0.017**	**0.739**	**0.000**	**0.400**
Greater Sandhill crane	0.017	0.739	0.000	0.400
Shorebirds	**0.000**	**0.256**	**0.058**	**0.000**
Killdeer	0.000	0.000	0.006	0.000
Long-billed curlew	0.000	0.256	0.052	0.000
Gull	**0.000**	**0.205**	**0.040**	**0.000**
Unidentified gull	0.000	0.205	0.040	0.000
Doves	**0.692**	**0.097**	**0.121**	**0.103**
Rock pigeon	0.686	0.091	0.069	0.097
Eurasian-collared dove	0.007	0.000	0.006	0.006
Mourning dove	0.000	0.006	0.046	0.000
Goatsucker	**0.000**	**0.000**	**0.006**	**0.000**
Common nighthawk	0.000	0.000	0.006	0.000

Species	Winter 2011-12	Spring 2011	Summer 2011	Fall 2011
Hummingbird	**0.000**	**0.006**	**0.000**	**0.000**
Unidentified hummingbird	0.000	0.006	0.000	0.000
Woodpecker	**0.000**	**0.000**	**0.000**	**0.017**
Northern flicker	0.000	0.000	0.000	0.017
Passerines	**11.381**	**9.210**	**6.803**	**9.543**
Songbirds	*10.672*	*8.466*	*6.254*	*8.680*
Western kingbird	0.000	0.017	0.081	0.017
Eastern kingbird	0.000	0.000	0.006	0.000
Horned lark	9.880	6.068	4.526	7.354
Loggerhead shrike	0.007	0.017	0.006	0.011
Northern shrike	0.003	0.000	0.000	0.000
Violet-green swallow	0.000	0.000	0.000	0.006
Northern rough-winged swallow	0.000	0.000	0.006	0.000
Barn swallow	0.000	0.034	0.081	0.091
Unidentified swallow	0.000	0.000	0.000	0.006
Rock wren	0.000	0.011	0.000	0.000
Mountain bluebird	0.000	0.023	0.000	0.000
American robin	0.067	0.000	0.000	0.000
European starling	0.231	0.068	0.040	0.126
American pipit	0.000	0.000	0.000	0.177
Lapland longspur	0.000	0.000	0.000	0.011
Chipping sparrow	0.000	0.011	0.000	0.000
Savannah sparrow	0.000	0.159	0.197	0.017
Grasshopper sparrow	0.000	0.097	0.104	0.000
White-crowned sparrow	0.000	0.057	0.000	0.000
Red-winged blackbird	0.000	0.000	0.000	0.011
Western meadowlark	0.445	1.818	1.023	0.651
Brewer's blackbird	0.000	0.040	0.064	0.000
Unidentified blackbird	0.000	0.000	0.006	0.000
Bullock's oriole	0.000	0.006	0.000	0.000
House finch	0.000	0.040	0.046	0.000
House sparrow	0.000	0.000	0.040	0.000
Unidentified passerine	0.040	0.000	0.029	0.200
Corvids	*0.709*	*0.744*	*0.549*	*0.863*
Black-billed magpie	0.013	0.006	0.000	0.006
Common raven	0.696	0.739	0.549	0.857
Totals	**14.903**	**12.483**	**8.630**	**12.589**
	% Composition[2]			
Waterfowl	**0.58**	**0.09**	**0.00**	**0.00**
Canada goose	0.00	0.09	0.00	0.00
Tundra swan	0.58	0.00	0.00	0.00
Gamebirds	**0.00**	**0.27**	**0.33**	**0.91**
Chukar	0.00	0.00	0.00	0.54
Ring-necked pheasant	0.00	0.27	0.33	0.36
Wading bird	**0.00**	**0.00**	**0.07**	**0.00**
Great blue heron	0.00	0.00	0.07	0.00
Raptors	**18.29**	**15.43**	**18.15**	**19.16**
Vulture	*0.00*	*0.00*	*0.07*	*0.00*
Turkey vulture	0.00	0.00	0.07	0.00
Eagles	*0.34*	*0.09*	*0.20*	*0.59*
Bald eagle	0.09	0.00	0.00	0.00
Golden eagle	0.25	0.09	0.20	0.59
Harrier	*5.97*	*3.64*	*3.28*	*5.99*
Northern harrier	5.97	3.64	3.28	5.99

Species	Winter 2011-12	Spring 2011	Summer 2011	Fall 2011
Accipiters	*0.02*	*0.05*	*0.00*	*0.27*
Sharp-shinned hawk	0.02	0.05	0.00	0.14
Cooper's hawk	0.00	0.00	0.00	0.05
Unidentified accipiter	0.00	0.00	0.00	0.09
Buteos	*11.22*	*11.47*	*12.93*	*10.85*
Swainson's hawk	0.00	3.50	7.64	1.95
Red-tailed hawk	1.75	0.91	4.09	6.04
Ferruginous hawk	0.07	0.59	0.67	0.23
Rough-legged hawk	9.00	6.33	0.00	1.91
Unidentified buteo	0.40	0.14	0.54	0.73
Owls	*0.09*	*0.00*	*0.60*	*0.14*
Burrowing owl	0.00	0.00	0.00	0.05
Short-eared owl	0.09	0.00	0.60	0.09
Falcons	*0.65*	*0.18*	*1.07*	*1.27*
American kestrel	0.34	0.18	0.94	1.04
Merlin	0.02	0.00	0.00	0.00
Prairie falcon	0.29	0.00	0.07	0.18
Unidentified falcon	0.00	0.00	0.07	0.05
Other raptors	*0.00*	*0.00*	*0.00*	*0.05*
Unidentified raptor	0.00	0.00	0.00	0.05
Crane	**0.11**	**5.92**	**0.00**	**3.18**
Greater Sandhill crane	0.11	5.92	0.00	3.18
Shorebirds	**0.00**	**2.05**	**0.67**	**0.00**
Killdeer	0.00	0.00	0.07	0.00
Long-billed curlew	0.00	2.05	0.60	0.00
Gull	**0.00**	**1.64**	**0.47**	**0.00**
Unidentified gull	0.00	1.64	0.47	0.00
Doves	**4.65**	**0.77**	**1.41**	**0.82**
Eurasian-collared dove	0.04	0.00	0.07	0.05
Mourning dove	0.00	0.05	0.54	0.00
Rock pigeon	4.60	0.73	0.80	0.77
Goatsucker	**0.00**	**0.00**	**0.07**	**0.00**
Common nighthawk	0.00	0.00	0.07	0.00
Hummingbird	**0.00**	**0.05**	**0.00**	**0.00**
Unidentified hummingbird	0.00	0.05	0.00	0.00
Woodpecker	**0.00**	**0.00**	**0.00**	**0.14**
Northern flicker	0.00	0.00	0.00	0.14
Passerines	**76.37**	**73.78**	**78.83**	**75.81**
Songbirds	*71.61*	*67.82*	*72.47*	*68.95*
Western kingbird	0.00	0.14	0.94	0.14
Eastern kingbird	0.00	0.00	0.07	0.00
Horned lark	66.29	48.61	52.44	58.42
Loggerhead shrike	0.04	0.14	0.07	0.09
Northern shrike	0.02	0.00	0.00	0.00
Violet-green swallow	0.00	0.00	0.00	0.05
Northern rough-winged swallow	0.00	0.00	0.07	0.00
Barn swallow	0.00	0.27	0.94	0.73
Unidentified swallow	0.00	0.00	0.00	0.05
Rock wren	0.00	0.09	0.00	0.00
Mountain bluebird	0.00	0.18	0.00	0.00
American robin	0.45	0.00	0.00	0.00
European starling	1.55	0.55	0.47	1.00
American pipit	0.00	0.00	0.00	1.41
Lapland longspur	0.00	0.00	0.00	0.09

Species	Winter 2011-12	Spring 2011	Summer 2011	Fall 2011
Chipping sparrow	0.00	0.09	0.00	0.00
Savannah sparrow	0.00	1.27	2.28	0.14
Grasshopper sparrow	0.00	0.77	1.21	0.00
White-crowned sparrow	0.00	0.46	0.00	0.00
Red-winged blackbird	0.00	0.00	0.00	0.09
Western meadowlark	2.98	14.57	11.86	5.17
Brewer's blackbird	0.00	0.32	0.74	0.00
Unidentified blackbird	0.00	0.00	0.07	0.00
Bullock's oriole	0.00	0.05	0.00	0.00
House finch	0.00	0.32	0.54	0.00
House sparrow	0.00	0.00	0.47	0.00
Unidentified passerine	0.27	0.00	0.33	1.59
Corvids	*4.76*	*5.96*	*6.36*	*6.85*
Black-billed magpie	0.09	0.05	0.00	0.05
Common raven	4.67	4.92	6.36	6.81
% Frequency of Occurrence[3]				
Waterfowl	**0.67**	**0.57**	**0.00**	**0.00**
Canada goose	0.00	0.57	0.00	0.00
Tundra swan	0.67	0.00	0.00	0.00
Gamebirds	**0.00**	**2.84**	**2.89**	**1.71**
Chukar	0.00	0.00	0.00	1.14
Ring-necked pheasant	0.00	2.84	2.89	1.14
Wading bird	**0.00**	**0.00**	**0.58**	**0.00**
Great blue heron	0.00	0.00	0.58	0.00
Raptors	**77.26**	**83.52**	**75.72**	**69.71**
Vulture	*0.00*	*0.00*	*0.58*	*0.00*
Turkey vulture	0.00	0.00	0.58	0.00
Eagles	*4.68*	*1.14*	*1.73*	*4.57*
Bald eagle	1.34	0.00	0.00	0.00
Golden eagle	3.68	1.14	1.73	4.57
Harrier	*45.82*	*34.09*	*21.39*	*40.00*
Northern harrier	45.82	34.09	21.39	40.00
Accipiters	*0.33*	*0.57*	*0.00*	*3.43*
Sharp-shinned hawk	0.33	0.57	0.00	1.71
Cooper's hawk	0.00	0.00	0.00	0.57
Unidentified accipiter	0.00	0.00	0.00	1.14
Buteos	*67.56*	*69.89*	*61.27*	*55.43*
Swainson's hawk	0.00	28.41	42.77	14.86
Red-tailed hawk	21.07	10.80	23.70	37.14
Ferruginous hawk	1.00	6.25	5.20	2.86
Rough-legged hawk	61.54	36.93	0.00	12.57
Unidentified buteo	3.34	1.70	4.05	7.43
Owls	*0.67*	*0.00*	*2.31*	*1.71*
Burrowing owl	0.00	0.00	0.00	0.57
Short-eared owl	0.67	0.00	2.31	1.14
Falcons	*9.03*	*2.27*	*8.09*	*13.71*
American kestrel	5.02	2.27	6.94	11.43
Merlin	0.33	0.00	0.00	0.00
Prairie falcon	4.35	0.00	0.58	1.71
Unidentified falcon	0.00	0.00	0.58	0.57
Other raptors	*0.00*	*0.00*	*0.00*	*0.57*
Unidentified raptor	0.00	0.00	0.00	0.57
Crane	**0.33**	**2.27**	**0.00**	**0.57**
Greater Sandhill crane	0.33	2.27	0.00	0.57

Species	Winter 2011-12	Spring 2011	Summer 2011	Fall 2011
Shorebirds	**0.00**	**14.77**	**3.47**	**0.00**
Killdeer	0.00	0.00	0.58	0.00
Long-billed curlew	0.00	14.77	2.89	0.00
Gull	**0.00**	**1.70**	**0.58**	**0.00**
Unidentified gull	0.00	1.70	0.58	0.00
Doves	**3.01**	**3.41**	**5.20**	**2.86**
Eurasian-collared dove	0.33	0.00	0.58	0.57
Mourning dove	0.00	0.57	2.89	0.00
Rock pigeon	3.01	2.84	2.31	2.29
Goatsucker	**0.00**	**0.00**	**0.58**	**0.00**
Common nighthawk	0.00	0.00	0.58	0.00
Hummingbird	**0.00**	**0.57**	**0.00**	**0.00**
Unidentified hummingbird	0.00	0.57	0.00	0.00
Woodpecker	**0.00**	**0.00**	**0.00**	**1.14**
Northern flicker	0.00	0.00	0.00	1.14
Passerines	**89.30**	**97.73**	**85.55**	**87.43**
Songbirds	*82.94*	*97.16*	*84.39*	*83.43*
Western kingbird	0.00	1.14	4.62	0.57
Eastern kingbird	0.00	0.00	0.58	0.00
Horned lark	81.27	91.48	76.30	78.86
Loggerhead shrike	0.67	1.14	0.58	1.14
Northern shrike	0.33	0.00	0.00	0.00
Violet-green swallow	0.00	0.00	0.00	0.57
Northern rough-winged swallow	0.00	0.00	0.58	0.00
Barn swallow	0.00	2.27	4.62	2.86
Unidentified swallow	0.00	0.00	0.00	0.57
Rock wren	0.00	0.57	0.00	0.00
Mountain bluebird	0.00	1.14	0.00	0.00
American robin	1.00	0.00	0.00	0.00
European starling	2.01	5.11	2.31	2.29
American pipit	0.00	0.00	0.00	4.57
Lapland longspur	0.00	0.00	0.00	0.57
Chipping sparrow	0.00	1.14	0.00	0.00
Savannah sparrow	0.00	9.66	9.83	0.57
Grasshopper sparrow	0.00	5.68	8.67	0.00
White-crowned sparrow	0.00	2.27	0.00	0.00
Red-winged blackbird	0.00	0.00	0.00	0.57
Western meadowlark	14.72	72.16	42.20	28.00
Brewer's blackbird	0.00	1.70	1.16	0.00
Unidentified blackbird	0.00	0.00	0.58	0.00
Bullock's oriole	0.00	0.57	0.00	0.00
House finch	0.00	1.14	1.73	0.00
House sparrow	0.00	0.00	1.16	0.00
Unidentified passerine	0.67	0.00	1.73	1.14
Corvids	*31.77*	*35.80*	*21.97*	*33.71*
Black-billed magpie	1.00	0.57	0.00	0.57
Common raven	31.44	35.80	21.97	33.14
Totals	**97.66**	**100.00**	**97.69**	**95.43**

[1] Mean Use: mean number of individuals within 800m plot/20-minute point count for each species or group provides an index of the magnitude of avian use, but it does not describe density.

[2] Percent Composition: mean use for a species/total use across all species, multiplied by 100, providing an estimate of the relative use of any particular species, compared to the use by all other species combined.

[3] Frequency of Occurrence: percentage of surveys in which a species was observed with the survey plot providing an index of how often a species occurs in the project area.

Table 4b. Mean use, percent composition, and percent frequency of occurrence for avian groups observed during avian use surveys at Wheatridge East, February 2011 through February 2012.

Species	Winter 2011-12	Spring 2011	Summer 2011	Fall 2011
	Mean Use[1]			
Gamebirds	**0.000**	**0.023**	**0.284**	**0.023**
Chukar	0.000	0.000	0.023	0.000
Gray partridge	0.000	0.023	0.261	0.023
Raptors	**0.660**	**0.907**	**0.489**	**0.250**
Eagle	*0.118*	*0.012*	*0.000*	*0.000*
Golden eagle	0.118	0.012	0.000	0.000
Harrier	*0.215*	*0.233*	*0.068*	*0.136*
Northern harrier	0.215	0.233	0.068	0.136
Accipiter	*0.000*	*0.000*	*0.000*	*0.011*
Cooper's hawk	0.000	0.000	0.000	0.011
Buteos	*0.285*	*0.605*	*0.352*	*0.102*
Swainson's hawk	0.000	0.047	0.182	0.023
Red-tailed hawk	0.042	0.221	0.125	0.057
Ferruginous hawk	0.014	0.093	0.034	0.023
Rough-legged hawk	0.229	0.233	0.000	0.000
Unidentified buteo	0.000	0.012	0.011	0.000
Falcons	*0.042*	*0.058*	*0.068*	*0.000*
American kestrel	0.014	0.023	0.034	0.000
Peregrine falcon	0.014	0.000	0.011	0.000
Prairie falcon	0.014	0.035	0.023	0.000
Crane	**0.000**	**0.000**	**0.000**	**1.523**
Greater Sandhill crane	0.000	0.000	0.000	1.523
Shorebirds	**0.000**	**1.407**	**0.341**	**0.011**
Killdeer	0.000	0.000	0.000	0.011
Long-billed curlew	0.000	1.407	0.341	0.000
Dove	**0.000**	**0.000**	**0.114**	**0.000**
Mourning dove	0.000	0.000	0.114	0.000
Hummingbird	**0.000**	**0.012**	**0.000**	**0.000**
Unidentified hummingbird	0.000	0.012	0.000	0.000
Passerines	**14.063**	**28.070**	**12.580**	**7.364**
Songbirds	*13.528*	*27.372*	*12.295*	*7.170*
Say's phoebe	0.000	0.000	0.000	0.011
Western kingbird	0.000	0.000	0.011	0.000
Loggerhead shrike	0.000	0.012	0.000	0.000
Northern shrike	0.014	0.000	0.000	0.000
Horned lark	11.896	14.767	8.318	6.568
Cliff swallow	0.000	1.140	0.330	0.000
Barn swallow	0.000	0.012	0.011	0.000
Unidentified swallow	0.000	0.500	0.057	0.000
Rock wren	0.000	0.000	0.011	0.000
American robin	0.014	0.000	0.000	0.000
European starling	0.021	4.209	0.000	0.080
American pipit	0.000	0.012	0.000	0.000
Savannah sparrow	0.000	0.047	0.023	0.034
Grasshopper sparrow	0.000	0.384	0.477	0.000
White-crowned sparrow	0.000	0.047	0.000	0.000
Western meadowlark	0.861	5.988	3.023	0.466
Brewer's blackbird	0.000	0.000	0.000	0.011
Gray-crowned rosy-finch	0.007	0.000	0.000	0.000

Species	Winter 2011-12	Spring 2011	Summer 2011	Fall 2011
Cassin's finch	0.375	0.000	0.000	0.000
Unidentified finch	0.007	0.000	0.000	0.000
Unidentified passerine	0.333	0.256	0.034	0.000
Corvids	*0.535*	*0.698*	*0.284*	*0.193*
Black-billed magpie	0.007	0.000	0.000	0.000
American crow	0.000	0.012	0.000	0.000
Common raven	0.528	0.686	0.284	0.193
Totals	**14.722**	**30.419**	**13.807**	**9.170**
	% Composition[2]			
Gamebirds	**0.00**	**0.08**	**2.06**	**0.25**
Chukar	0.00	0.00	0.16	0.00
Gray partridge	0.00	0.08	1.89	0.25
Raptors	**4.48**	**2.98**	**3.54**	**2.73**
Eagle	*0.80*	*0.04*	*0.00*	*0.00*
Golden eagle	0.80	0.04	0.00	0.00
Harrier	*1.46*	*0.76*	*0.49*	*1.49*
Northern harrier	1.46	0.76	0.49	1.49
Accipiter	*0.00*	*0.00*	*0.00*	*0.12*
Cooper's hawk	0.00	0.00	0.00	0.12
Buteos	*1.93*	*1.99*	*2.55*	*1.12*
Swainson's hawk	0.00	0.15	1.32	0.25
Red-tailed hawk	0.28	0.73	0.91	0.62
Ferruginous hawk	0.09	0.31	0.25	0.25
Rough-legged hawk	1.56	0.76	0.00	0.00
Unidentified buteo	0.00	0.04	0.08	0.00
Falcons	*0.28*	*0.19*	*0.49*	*0.00*
American kestrel	0.09	0.08	0.25	0.00
Peregrine falcon	0.09	0.00	0.08	0.00
Prairie falcon	0.09	0.11	0.16	0.00
Crane	**0.00**	**0.00**	**0.00**	**16.60**
Greater Sandhill crane	0.00	0.00	0.00	16.60
Shorebirds	**0.00**	**4.63**	**2.47**	**0.12**
Killdeer	0.00	0.00	0.00	0.12
Long-billed curlew	0.00	4.63	2.47	0.00
Dove	**0.00**	**0.00**	**0.82**	**0.00**
Mourning dove	0.00	0.00	0.82	0.00
Hummingbird	**0.00**	**0.04**	**0.00**	**0.00**
Unidentified hummingbird	0.00	0.04	0.00	0.00
Passerines	**95.52**	**92.28**	**91.11**	**80.30**
Songbirds	*91.89*	*89.98*	*89.05*	*78.19*
Say's phoebe	0.00	0.00	0.00	0.12
Western kingbird	0.00	0.00	0.08	0.00
Loggerhead shrike	0.00	0.04	0.00	0.00
Northern shrike	0.09	0.00	0.00	0.00
Horned lark	80.80	48.55	60.25	71.62
Cliff swallow	0.00	3.75	2.39	0.00
Barn swallow	0.00	0.04	0.08	0.00
Unidentified swallow	0.00	1.64	0.41	0.00
Rock wren	0.00	0.00	0.08	0.00
American robin	0.09	0.00	0.00	0.00
European starling	0.14	13.84	0.00	0.87
American pipit	0.00	0.04	0.00	0.00
Savannah sparrow	0.00	0.15	0.16	0.37

Species	Winter 2011-12	Spring 2011	Summer 2011	Fall 2011
Grasshopper sparrow	0.00	1.26	3.46	0.00
White-crowned sparrow	0.00	0.15	0.00	0.00
Western meadowlark	5.85	19.69	21.89	5.08
Brewer's blackbird	0.00	0.00	0.00	0.12
Gray-crowned rosy-finch	0.05	0.00	0.00	0.00
Cassin's finch	2.55	0.00	0.00	0.00
Unidentified finch	0.05	0.00	0.00	0.00
Unidentified passerine	2.26	0.84	0.25	0.00
Corvids	*3.63*	*2.29*	*2.06*	*2.11*
Black-billed magpie	0.05	0.00	0.00	0.00
American crow	0.00	0.04	0.00	0.00
Common raven	3.58	2.26	2.06	2.11

% Frequency of Occurrence[3]

Gamebirds	**0.00**	**1.16**	**3.41**	**1.14**
Chukar	0.00	0.00	1.14	0.00
Gray partridge	0.00	1.16	2.27	1.14
Raptors	**43.75**	**50.00**	**37.50**	**20.45**
Eagle	*9.03*	*1.16*	*0.00*	*0.00*
Golden eagle	9.03	1.16	0.00	0.00
Harrier	*15.97*	*20.93*	*6.82*	*11.36*
Northern harrier	15.97	20.93	6.82	11.36
Accipiter	*0.00*	*0.00*	*0.00*	*1.14*
Cooper's hawk	0.00	0.00	0.00	1.14
Buteos	*20.14*	*36.05*	*25.00*	*9.09*
Swainson's hawk	0.00	4.65	13.64	2.27
Red-tailed hawk	4.17	13.95	11.36	5.68
Ferruginous hawk	1.39	5.81	3.41	2.27
Rough-legged hawk	15.28	12.79	0.00	0.00
Unidentified buteo	0.00	1.16	1.14	0.00
Falcons	*4.17*	*5.81*	*6.82*	*0.00*
American kestrel	1.39	2.33	3.41	0.00
Peregrine falcon	1.39	0.00	1.14	0.00
Prairie falcon	1.39	3.49	2.27	0.00
Crane	**0.00**	**0.00**	**0.00**	**2.27**
Greater Sandhill crane	0.00	0.00	0.00	2.27
Shorebirds	**0.00**	**36.05**	**14.77**	**1.14**
Killdeer	0.00	0.00	0.00	1.14
Long-billed curlew	0.00	36.05	14.77	0.00
Dove	**0.00**	**0.00**	**2.27**	**0.00**
Mourning dove	0.00	0.00	2.27	0.00
Hummingbird	**0.00**	**1.16**	**0.00**	**0.00**
Unidentified hummingbird	0.00	1.16	0.00	0.00
Passerines	**86.81**	**100.00**	**97.73**	**85.23**
Songbirds	*84.03*	*100.00*	*97.73*	*84.09*
Say's phoebe	0.00	0.00	0.00	1.14
Western kingbird	0.00	0.00	1.14	0.00
Loggerhead shrike	0.00	1.16	0.00	0.00
Northern shrike	1.39	0.00	0.00	0.00
Horned lark	81.94	96.51	88.64	75.00
Cliff swallow	0.00	12.79	9.09	0.00
Barn swallow	0.00	1.16	1.14	0.00
Unidentified swallow	0.00	2.33	2.27	0.00
Rock wren	0.00	0.00	1.14	0.00

Species	Winter 2011-12	Spring 2011	Summer 2011	Fall 2011
American robin	1.39	0.00	0.00	0.00
European starling	0.69	8.14	0.00	1.14
American pipit	0.00	1.16	0.00	0.00
Savannah sparrow	0.00	3.49	2.27	1.14
Grasshopper sparrow	0.00	27.91	28.41	0.00
White-crowned sparrow	0.00	1.16	0.00	0.00
Western meadowlark	22.22	94.19	68.18	26.14
Brewer's blackbird	0.00	0.00	0.00	1.14
Gray-crowned rosy-finch	0.69	0.00	0.00	0.00
Cassin's finch	2.08	0.00	0.00	0.00
Unidentified finch	0.69	0.00	0.00	0.00
Unidentified passerine	3.47	5.81	3.41	0.00
Corvids	*21.53*	*25.58*	*15.91*	*7.95*
Black-billed magpie	0.69	0.00	0.00	0.00
American crow	0.00	1.16	0.00	0.00
Common raven	20.83	24.42	15.91	7.95
Totals	**93.75**	**100.00**	**97.73**	**87.50**

[1] Mean Use: mean number of individuals within 800m plot/20-minute point count for each species or group provides an index of the magnitude of avian use, but it does not describe density.

[2] Percent Composition: mean use for a species/total use across all species, multiplied by 100, providing an estimate of the relative use of any particular species, compared to the use by all other species combined.

[3] Frequency of Occurrence: percentage of surveys in which a species was observed with the survey plot providing an index of how often a species occurs in the project area.

Table 5. Estimated raptor nest densities at Wheatridge Wind Energy Facility and other regional and proposed and existing wind projects located primarily in comparable Columbia Plateau environments.*

Project Site**	Raptor Nest Density (# / mi^2), rounded							
	All Raptor Species Combined	Buteos				Eagle	Falcon	Owl
		SWHA	RTHA	FEHA	UNBU	GOEA	PRFA	GHOW
Willow Creek Winds, OR	0.80	0.44	0.07	0.25	0.00	0.00	0.00	0.04
Rattlesnake Road, OR	0.45	0.19	0.13	0.05	0.00	0.00	0.08	0.00
Hopkins Ridge, WA	0.42	0.01	0.27	0.01	0.05	0.00	0.00	0.08
Leaning Juniper I, OR	0.41	0.18	0.16	0.03	0.00	0.00	0.02	0.02
Leaning Juniper IIB, OR	0.40	0.19	0.13	0.06	0.00	0.00	0.02	0.00
Baseline Wind, OR	0.35	0.14	0.11	0.04	0.01	0.01	0.01	0.03
Wheat Field, OR	0.26	0.06	0.12	0.03	0.00	0.00	0.06	0.00
Golden Hills, OR	0.25	0.04	0.16	0.00	0.00	0.00	0.00	0.05
Summit Ridge, OR	0.24	0.00	0.20	0.00	0.01	0.00	0.01	0.01
Pebble Springs, OR***	0.24	0.18	0.06	0.00	0.00	0.00	0.00	0.00
Klondike I and II	0.23	0.07	0.11	0.00	0.00	0.01	0.00	0.04
Wheatridge West, OR	**0.22**	**0.16**	**0.02**	**0.03**	**0.00**	**0.00**	**0.00**	**0.02**
Stateline OR/WA	0.21	0.03	0.08	0.03	0.00	0.00	0.00	0.07
Klondike III, OR	0.20	0.04	0.11	0.00	0.01	0.00	0.00	0.03
Hay Canyon, OR	0.18	0.02	0.16	0.00	0.00	0.00	0.00	0.00
Wild Horse, WA	0.16	0.00	0.12	0.00	0.00	0.00	0.02	0.02
Biglow Canyon, OR	0.15	0.04	0.08	0.00	0.00	0.00	0.00	0.02
Klickitat County, WA	0.12	0.00	0.09	0.00	0.00	0.00	0.01	0.03
Big Horn, WA	0.11	0.00	0.06	0.00	0.00	0.00	0.01	0.04
Echo Wind Farms, OR	0.10	0.06	0.04	0.00	0.00	0.00	0.00	0.00
Wheatridge East, OR	**0.07**	**0.03**	**0.03**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
AVERAGE (not including Wheatridge West or Wheatridge East)	0.28							

Note: American kestrel, northern harrier. short-eared owl, and burrowing owl are omitted due to difficulty in locating and confirming nesting of these species with the raptor nest survey method (helicopter survey) employed in this and other studies.

Codes:

SWHA = Swainson's hawk
RTHA = red-tailed hawk
FEHA = ferruginous hawk
GOEA = golden eagle
PRFA = prairie falcon
GHOW = great horned owl
UNBU = unknown species of the genus *Buteo*

* Studies with similar study methods. Arid grassland and shrub-steppe environments with extensive dryland wheat, non-native grassland (CRP), and narrow riparian corridors in some drainages.

** References for projects included (does not include all CPE wind projects): Baseline (Gerhardt et al., 2011), Big Horn (Johnson and Erickson, 2004), Biglow Canyon (WEST, 2005b), Echo (Gritski and Kronner, 2010a), Golden Hills (Jeffrey et al., 2008), Hay Canyon (formerly Grass Valley; Gritski et al., 2007), Hopkins Ridge (Young et al., 2003), Klickitat County (Johnson et al., 2003a), Klondike I and II (Johnson et al., 2002), Klondike III (Mabee et al., 2005), Leaning Juniper I (Kronner et al., 2005a), Leaning Juniper II (NWC 2009), Pebble Springs (Gritski and Kronner, 2010b), Rattlesnake Road (Kronner et al., 2007a), Stateline (Erickson et al., 2004; NWC and WEST, 2001), Summit Ridge (Gerhardt et al., 2010), Wheat Field (Kronner et al., 2008a), Wild Horse (Erickson et al., 2003a), Willow Creek Winds (Kronner et al., 2007b).

*** Post-construction study of operating project, Project area only.

Table 6a. Number of detections of select species observed within 800m by plot during four seasons of avian use study at Wheatridge West portion of the Wheatridge Wind Energy Facility, February 2011 through February 2012.

Species	Plots																Total
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	
Winter 2011-2012																	
Raptors	**22**	**35**	**31**	**23**	**24**	**30**	**22**	**58**	**69**	**52**	**59**	**82**	**79**	**77**	**68**	**84**	**815**
Harrier	*4*	*6*	*6*	*2*	*3*	*2*	*1*	*12*	*27*	*21*	*21*	*37*	*39*	*34*	*17*	*34*	*266*
Northern harrier	4	6	6	2	3	2	1	12	27	21	21	37	39	34	17	34	266
Eagles	*0*	*1*	*0*	*1*	*0*	*0*	*1*	*1*	*1*	*2*	*0*	*2*	*1*	*4*	*0*	*1*	*15*
Bald eagle	0	0	0	1	0	0	1	1	0	0	0	0	0	1	0	0	4
Golden eagle	0	1	0	0	0	0	0	0	1	2	0	2	1	3	0	1	11
Accipiter	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1*
Sharp-shinned hawk	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Buteos	*17*	*24*	*22*	*17*	*20*	*27*	*17*	*43*	*36*	*28*	*38*	*41*	*36*	*39*	*49*	*46*	*500*
Red-tailed hawk	1	4	0	1	1	5	2	9	6	4	6	6	11	12	5	5	78
Ferruginous hawk	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2	0	3
Rough-legged hawk	15	19	20	16	19	17	14	33	26	24	31	35	25	24	42	41	401
Unidentified buteo	1	1	2	0	0	5	1	0	4	0	1	0	0	3	0	0	18
Owl	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*0*	*2*	*0*	*0*	*0*	*4*
Short-eared owl	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	4
Falcons	*1*	*3*	*3*	*3*	*1*	*1*	*3*	*2*	*3*	*1*	*0*	*2*	*1*	*0*	*2*	*3*	*29*
American kestrel	0	2	0	1	0	0	3	0	3	0	0	0	1	0	2	3	15
Merlin	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Prairie falcon	1	1	3	1	1	1	0	2	0	1	0	2	0	0	0	0	13
Passerines *(Songbirds)*	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**
Loggerhead shrike	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total by Plot	**22**	**35**	**33**	**23**	**24**	**30**	**22**	**58**	**69**	**52**	**59**	**82**	**79**	**77**	**68**	**84**	**817**
Spring 2011																	
Raptors	**19**	**35**	**19**	**17**	**19**	**17**	**21**	**20**	**13**	**18**	**20**	**27**	**17**	**16**	**38**	**23**	**339**
Eagle	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*0*	*0*	*0*	*0*	*2*
Golden eagle	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
Harrier	*3*	*1*	*6*	*0*	*4*	*4*	*4*	*3*	*3*	*5*	*5*	*11*	*11*	*7*	*6*	*7*	*80*
Northern harrier	3	1	6	0	4	4	4	3	3	5	5	11	11	7	6	7	80
Accipiter	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*1*
Sharp-shinned hawk	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1

Species	Plots																Total
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	
Buteos	*16*	*34*	*13*	*16*	*15*	*12*	*17*	*17*	*10*	*10*	*14*	*15*	*6*	*9*	*32*	*16*	*252*
Swainson's hawk	9	14	3	2	5	6	5	9	2	1	1	0	0	1	13	6	77
Red-tailed hawk	1	2	1	1	0	1	1	0	1	1	2	5	1	1	1	1	20
Ferruginous hawk	0	3	1	0	0	0	2	0	0	0	0	4	0	1	2	0	13
Rough-legged hawk	6	14	8	13	10	5	9	8	7	8	9	6	5	6	16	9	139
Unidentified buteo	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0	0	3
Falcon	*0*	*0*	*0*	*1*	*0*	*1*	*0*	*0*	*0*	*0*	*1*	*1*	*0*	*0*	*0*	*0*	*4*
American kestrel	0	0	0	1	0	1	0	0	0	0	1	1	0	0	0	0	4
Shorebird	**20**	**4**	**4**	**1**	**9**	**0**	**2**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**45**
Long-billed curlew	20	4	4	1	9	0	2	2	0	0	0	0	0	0	3	0	45
Passerines *(Songbirds)*	**0**	**1**	**3**	**0**	**0**	**0**	**0**	**3**	**5**	**0**	**5**	**0**	**0**	**2**	**1**	**0**	**20**
Loggerhead shrike	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Grasshopper sparrow	0	0	1	0	0	0	0	3	5	0	5	0	0	2	1	0	17
Total by Plot	**39**	**40**	**26**	**18**	**28**	**17**	**23**	**25**	**18**	**18**	**25**	**27**	**17**	**18**	**42**	**23**	**404**

	Summer 2011																
Raptors	**16**	**20**	**11**	**9**	**6**	**11**	**5**	**17**	**22**	**22**	**18**	**19**	**24**	**24**	**21**	**26**	**271**
Vultures	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1*
Turkey vulture	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Eagle	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*1*	*0*	*0*	*3*
Golden eagle	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0	0	3
Harrier	*0*	*1*	*2*	*1*	*0*	*1*	*0*	*2*	*6*	*5*	*4*	*1*	*13*	*7*	*0*	*6*	*49*
Northern harrier	0	1	2	1	0	1	0	2	6	5	4	1	13	7	0	6	49
Buteos	*14*	*18*	*7*	*7*	*6*	*7*	*5*	*13*	*14*	*15*	*10*	*18*	*7*	*13*	*20*	*19*	*193*
Swainson's hawk	12	11	6	5	5	6	3	2	5	10	1	7	6	0	19	16	114
Red-tailed hawk	1	2	0	2	1	1	2	10	7	3	7	8	1	13	1	2	61
Ferruginous hawk	0	0	0	0	0	0	0	1	2	2	2	3	0	0	0	0	10
Unidentified buteo	1	5	1	0	0	0	0	0	0	0	0	0	0	0	0	1	8
Owl	*0*	*0*	*2*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*3*	*3*	*0*	*1*	*9*
Short-eared owl	0	0	2	0	0	0	0	0	0	0	0	0	3	3	0	1	9
Falcons	*2*	*0*	*0*	*1*	*0*	*3*	*0*	*1*	*2*	*2*	*3*	*0*	*1*	*0*	*1*	*0*	*16*
American kestrel	2	0	0	0	0	3	0	1	1	2	3	0	1	0	1	0	14
Prairie falcon	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Unidentified falcon	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Shorebird	**6**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**9**
Long-billed curlew	6	1	0	0	0	0	1	0	0	0	0	0	0	0	1	0	9

Species	Plots																Total
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	
Passerines *(Songbirds)*	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**8**	**2**	**5**	**0**	**0**	**0**	**1**	**0**	**19**
Grasshopper sparrow	1	0	0	0	0	0	0	1	8	2	5	0	0	0	1	0	18
Loggerhead shrike	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total by Plot	**23**	**21**	**12**	**9**	**6**	**11**	**6**	**18**	**30**	**24**	**23**	**19**	**24**	**24**	**23**	**26**	**299**

Fall 2011

Raptors	**6**	**15**	**3**	**6**	**7**	**9**	**9**	**32**	**63**	**37**	**45**	**51**	**54**	**37**	**19**	**29**	**422**
Eagle	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*2*	*5*	*5*	*0*	*0*	*0*	*0*	*13*
Golden eagle	0	0	0	0	0	0	0	1	0	2	5	5	0	0	0	0	13
Harrier	*1*	*5*	*0*	*2*	*0*	*0*	*2*	*13*	*23*	*8*	*15*	*12*	*17*	*12*	*6*	*16*	*132*
Northern harrier	1	5	0	2	0	0	2	13	23	8	15	12	17	12	6	16	132
Accipiters	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*2*	*1*	*0*	*0*	*1*	*0*	*1*	*0*	*0*	*6*
Sharp-shinned hawk	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	0	3
Cooper's hawk	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Unidentified accipiter	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	2
Buteos	*4*	*10*	*2*	*4*	*7*	*7*	*5*	*13*	*38*	*23*	*20*	*32*	*34*	*22*	*9*	*9*	*239*
Swainson's hawk	1	4	0	0	3	2	0	3	7	6	3	5	0	1	4	4	43
Red-tailed hawk	1	4	0	2	1	2	3	7	25	11	13	17	30	14	1	2	133
Ferruginous hawk	0	0	0	0	0	0	0	0	0	1	1	3	0	0	0	0	5
Rough-legged hawk	1	0	2	2	3	2	2	3	3	4	3	4	4	3	3	3	42
Unidentified buteo	1	2	0	0	0	1	0	0	3	1	0	3	0	4	1	0	16
Owls	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*1*	*0*	*0*	*1*	*3*
Burrowing owl	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Short-eared owl	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	2
Falcons	*1*	*0*	*1*	*0*	*0*	*1*	*2*	*3*	*1*	*3*	*5*	*1*	*2*	*1*	*4*	*3*	*28*
American kestrel	1	0	1	0	0	1	2	3	0	1	5	0	2	0	4	3	23
Prairie falcon	0	0	0	0	0	0	0	0	0	2	0	1	0	1	0	0	4
Unidentified falcon	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Other Raptors	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*1*
Unidentified raptor	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Passerines *(Songbirds)*	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**
Loggerhead shrike	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total by Plot	**6**	**17**	**3**	**6**	**7**	**9**	**9**	**32**	**63**	**37**	**45**	**51**	**54**	**37**	**19**	**29**	**424**

Table 6b. Number of individuals of select species observed within 800m by plot during four seasons of avian use study at Wheatridge East portion of the Wheatridge Wind Energy Facility, February 2011 through February 2012.

Species	Plots								Total	Plots								Total
	A	B	C	D	E	F	G	H		A	B	C	D	E	F	G	H	
	Winter 2011-2012									Spring 2011								
Raptor	**10**	**17**	**15**	**12**	**20**	**12**	**7**	**2**	**95**	**16**	**15**	**5**	**6**	**8**	**4**	**10**	**14**	**78**
Eagle	*2*	*0*	*2*	*2*	*3*	*5*	*2*	*1*	*17*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1*
Golden eagle	2	0	2	2	3	5	2	1	17	1	0	0	0	0	0	0	0	1
Harrier	*5*	*4*	*3*	*2*	*9*	*6*	*1*	*1*	*31*	*7*	*3*	*1*	*3*	*0*	*1*	*2*	*3*	*20*
Northern harrier	5	4	3	2	9	6	1	1	31	7	3	1	3	0	1	2	3	20
Buteos	*2*	*12*	*8*	*8*	*7*	*0*	*4*	*0*	*41*	*7*	*11*	*4*	*3*	*8*	*2*	*7*	*10*	*52*
Swainson's hawk	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1	4
Red-tailed hawk	2	2	1	1	0	0	0	0	6	0	1	2	0	1	2	5	8	19
Ferruginous hawk	0	1	1	0	0	0	0	0	2	0	7	0	0	0	0	1	0	8
Rough-legged hawk	0	9	6	7	7	0	4	0	33	6	2	2	3	7	0	0	0	20
Unidentified buteo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Falcons	*1*	*1*	*2*	*0*	*1*	*1*	*0*	*0*	*6*	*1*	*1*	*0*	*0*	*0*	*1*	*1*	*1*	*5*
American kestrel	0	1	1	0	0	0	0	0	2	0	1	0	0	0	0	1	0	2
Peregrine falcon	0	0	1	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0
Prairie falcon	1	0	0	0	0	1	0	0	2	1	0	0	0	0	1	0	1	3
Shorebird	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**54**	**5**	**45**	**10**	**1**	**4**	**121**
Long-billed curlew	0	0	0	0	0	0	0	0	0	1	1	54	5	45	10	1	4	121
Passerines *(Songbirds)*	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**2**	**1**	**5**	**0**	**9**	**8**	**7**	**34**
Loggerhead shrike	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Grasshopper sparrow	0	0	0	0	0	0	0	0	0	2	2	1	4	0	9	8	7	33
Total by Plot	**10**	**17**	**15**	**12**	**20**	**12**	**7**	**2**	**95**	**19**	**18**	**60**	**16**	**53**	**23**	**19**	**25**	**233**
	Summer 2011									Fall 2011								
Raptor	**5**	**3**	**6**	**6**	**7**	**6**	**3**	**7**	**43**	**2**	**4**	**5**	**1**	**5**	**5**	**0**	**0**	**22**
Harrier	*0*	*0*	*1*	*3*	*0*	*2*	*0*	*0*	*6*	*1*	*2*	*1*	*0*	*4*	*4*	*0*	*0*	*12*
Northern harrier	0	0	1	3	0	2	0	0	6	1	2	1	0	4	4	0	0	12
Accipiter	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*1*
Cooper's hawk	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Buteos	*5*	*1*	*4*	*3*	*7*	*3*	*3*	*5*	*31*	*1*	*1*	*4*	*1*	*1*	*1*	*0*	*0*	*9*
Swainson's hawk	1	1	3	1	6	1	1	2	16	0	0	2	0	0	0	0	0	2
Red-tailed hawk	2	0	0	2	1	1	2	3	11	1	1	1	0	1	1	0	0	5

Species	Plots								Total	Plots								Total
	A	B	C	D	E	F	G	H		A	B	C	D	E	F	G	H	
Ferruginous hawk	2	0	1	0	0	0	0	0	3	0	0	1	1	0	0	0	0	2
Unidentified buteo	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0
Falcons	*0*	*2*	*1*	*0*	*0*	*1*	*0*	*2*	*6*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
American kestrel	0	1	0	0	0	0	0	2	3	0	0	0	0	0	0	0	0	0
Peregrine falcon	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Prairie falcon	0	1	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0
Shorebird	**1**	**0**	**12**	**0**	**7**	**5**	**0**	**5**	**30**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Long-billed curlew	1	0	12	0	7	5	0	5	30	0	0	0	0	0	0	0	0	0
Passerines *(Songbirds)*	**6**	**9**	**1**	**6**	**0**	**7**	**11**	**2**	**42**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Grasshopper sparrow	6	9	1	6	0	7	11	2	42	0	0	0	0	0	0	0	0	0
Total by Plot	**12**	**12**	**19**	**12**	**14**	**18**	**14**	**14**	**115**	**2**	**4**	**5**	**1**	**5**	**5**	**0**	**0**	**22**

Table 7. Bat monitoring station habitat descriptions at Wheatridge Wind Energy Facility, July through October 2011.

Station	Project Portion	Situation and Habitat
1A	Wheatridge West	On rimrock; in Sagebrush Shrub-steppe
1B	Wheatridge West	Facing water trough in stockade; in Exotic Annual Grassland
2A	Wheatridge West	On dead tree over creek; in Sagebrush Shrub-steppe
2B	Wheatridge West	On fence post next to old barn; in Developed-Other habitat
3A	Wheatridge West	On fence post next to grove of trees; in Revegetated Grassland
3B	Wheatridge West	On fence post near trees, trough; in Native Perennial Grassland
4A	Wheatridge East	On old windmill; in Native Perennial Grassland
4B	Wheatridge East	On fence post; in Exotic Annual Grassland
5A	Wheatridge East	On met tower; in Exotic Annual Grassland
5B	Wheatridge East	On old windmill leg; in Native Perennial Grassland
7A	Intraconnection Corridor	On willow near creek; in Riparian habitat
7B	Intraconnection Corridor	On fencepost next to tree; in Riparian habitat

Table 8. Bat species detected by survey station at Wheatridge Wind Energy Facility, July through October 2011.

Common Name	Species	Acoustic Monitoring Site											
		1A	1B	2A	2B	3A	3B	4A	4B	5A	5B	7A	7B
Hoary bat	*Lasiurus cinereus*	X			X	X	X			X			X
Silver-haired bat	*Lasionycteris noctivagans*	X	X	X	X	X	X	X	X	X		X	X
California myotis	*Myotis californicus*												X
Small-footed myotis	*Myotis ciliolabrum*	X	X		X	X	X			X	X	X	X
Long-eared myotis	*Myotis evotis*												X
Little brown bat	*Myotis lucifugus*					X				X		X	X
Long-legged myotis	*Myotis volans*												X
Canyon bat	*Parastrellus hesperus*						X			X		X	X

Table 9. Project and turbine characteristics of regional wind energy facilities where wildlife fatality monitoring studies have been completed.

Columbia Plateau Ecoregion Wind Project*	Project Size		Turbine Characteristics		
	# Turbines	MW	RD** (meters)	Tip Height (max. meters)	MW
Big Horn, WA	133	199.5	77	118.5	1.5
Biglow Canyon I, OR	76	125.4	90	121	1.65
Biglow Canyon II, OR	65	150	93	126.5	2.3
Biglow Canyon III, OR	76	174.8	93	126.5	2.3
Combine Hills I/II, OR	104	104	61.4	84	1.0
Echo Wind, OR (2 types of turbines)	37	20/44.6	92/82	126/121	2.0/1.65
Goodnoe Hills, WA	47	94	92.5	135	2.0
Harvest Wind, WA	43	98.9	93	126.5	2.3
Hay Canyon, OR	48	100.8	97	124	2.1
Hopkins Ridge I, WA	83	150	80	107	1.8
Juniper Canyon, WA	63	151.2	80	127.5	2.4
Kittitas Valley, WA	48	100.8	97	124	2.1
Klondike I, OR	16	24	65	100	1.5
Klondike II, OR	50	75	77	118.5	1.5
Klondike III, OR (Phase 1) (3 types of turbines)	80/44/1	120/101.2/2.4	77/93/100	118.5/126.5/127.5	1.5/2.3/2.4
Klondike IIIa, OR (Phase 2)	51	77	77	118.5	1.5
Leaning Juniper I, OR	67	100.5	77	118.5	1.5
Leaning Juniper II, OR	43/74	90.3/111	88/77	123/118.5	2.1/1.5
Lower Snake River, WA	149	342.7	93	126.5	2.3
Marengo I, WA	78	140.4	80	110	1.8
Marengo II, WA	39	70.2	80	110	1.8
Nine Canyon I, WA	37	48	62	91	1.3
Pebble Springs, OR	47	98.7	97	124	2.1
Rattlesnake Road, OR	49	102.9	88	123	2.1
Star Point, OR	47	98.7	97	124	2.1
Stateline I and 2, OR/WA	454	300	47	74/89 (20	0.66
Stateline 3, OR	43	98.9	93	126.5	2.3
Tuolumne, WA (2 types of turbines)	42/20	136.6	93/92.5	126.5/135	2.3/2.0
Vansycle, OR	38	25	47	74	0.66
Vantage, OR	60	90	77	118.5	1.5
Wheat Field, OR	46	96.6	88	123	2.1
White Creek Wind I, WA	89	204.7	93	126.5	2.3
Windy Flats, WA	114	262.2	93	126.5	2.3
Windy Pt II, WA	29	62.1	93	126.5	2.3
Wild Horse, WA	127	229	80	107	1.8
Willow Creek Winds, OR	48	72	77	118.5	1.5

Table 10. Reported mean annual fatality estimates on a per MW and per turbine basis for all birds and raptors in the Columbia Plateau Ecoregion where wildlife fatality monitoring studies have been completed and reports are public.

Columbia Plateau Ecoregion Wind Project[1]	All Bird Fatality Rates		Raptor Fatality Rates	
Listed in order of highest to lowest. All Bird Fatality Rate per MW/Year	# / MW	# / Turbine	# / MW	# / Turbine
Windy Flats, WA (Year 1)	8.45	19.43	0.04	0.09
Leaning Juniper I, OR[2]	6.66	9.99	0.21	0.32
Biglow Canyon, OR (Phase II, Year 1)	5.53	12.73	0.14	0.33
Biglow Canyon, OR (Phase III, Year 2)	4.41	10.14	0.06	0.14
White Creek Wind I, WA[2]	4.05	9.31	0.47	1.09
Willow Creek Wind, OR[2]	3.22	4.82	0.38	0.57
Tuolumne, WA	3.20	7.06	0.29	0.63
Klondike III, OR (Phase 1)[2]	3.19	5.65	0.15	0.27
Klondike II, OR	3.14	4.71	0.11	0.17
Hopkins Ridge I, WA (Phase 1, Year 2)	2.99	5.38	0.07	0.12
Harvest Wind, WA[2]	2.94	6.76	0.23	0.52
Stateline 1 and 2, OR/WA (2001–2003)	2.92	1.93	0.09	0.06
Juniper Canyon, WA[2]	2.80	6.87	0.18	0.44
Klondike IIIa, OR (Phase 2)[2]	2.80	4.20	0.06	0.09
Nine Canyon I, WA	2.76	3.59	0.05	0.07
Biglow Canyon, OR (Phase II, Year 2)	2.60	5.98	0.03	0.06
Combine Hills I, OR (2004/2005)	2.56	2.56	0.00	0.00
Big Horn, WA[2]	2.54	3.81	0.15	0.23
Leaning Juniper II, OR[2]	2.50	4.31	0.07	0.12
Biglow Canyon, OR (Phase I, Year 2)	2.47	4.07	0.04	0.06
Juniper Canyon, WA	2.24	3.85	0.05	0.08
Combine Hills I/II, OR (2011)	2.33	2.33	0.08	0.08
Biglow Canyon, OR (Phase III, Year 1)	2.28	5.25	0.05	0.11
Leaning Juniper II, OR	2.24	3.85	0.05	0.08
Hay Canyon, OR[2]	2.21	4.65	0.00	0.00
Rattlesnake Road, OR[2]	2.16	4.54	0.06	0.13
Pebble Springs, OR[2]	1.93	4.06	0.04	0.08
Biglow Canyon, OR (Phase I, Year 1)	1.76	2.90	0.03	0.06
Vantage, WA[2]	1.60	2.40	0.35	0.53
Wild Horse, WA	1.55	2.79	0.09	0.17
Kittitas Valley, WA (Year 2)[2]	1.54	3.23	0.03	0.06
Wheat Field, OR[2]	1.42	2.99	0.28	0.60
Goodnoe Hills, WA	1.40	2.80	0.17	0.34
Vantage, WA	1.30	1.90	0.29	0.44
Hopkins Ridge I, WA (Phase 1, Year 1)	1.23	2.21	0.14	0.25
Stateline 1 and 2, OR/WA (2006)	1.23	0.81	0.11	0.07
Lower Snake River, WA	1.15	2.64	0.35	0.81
Kittitas Valley, WA (Year 1)[2]	1.06	2.23	0.09	0.19
Klondike I, OR	0.95	1.43	0.00	0.00
Vansycle, OR	0.95	0.63	0.00	0.00
Star Point, OR[2]	0.80	1.70	0.00	0.00

Columbia Plateau Ecoregion Wind Project[1]	All Bird Fatality Rates		Raptor Fatality Rates	
Listed in order of highest to lowest. All Bird Fatality Rate per MW/Year	# / MW	# / Turbine	# / MW	# / Turbine
Echo Wind, OR[2]	0.66	1.15	0.04	0.07
Stateline 3, OR[2]	0.43	1.01	0.07	0.16
Stateline 3, OR	0.36	0.84	0.05	0.12
Marengo I, WA (Year 1)	0.27	0.49	0.00	0.00
Marengo I, WA (Year 2)	0.22	0.40	0.03	0.05
Marengo II, WA (Year 2)	0.17	0.31	0.00	0.00
Marengo II, WA (Year 1)	0.16	0.29	0.05	0.09
Mean[3]	**2.32**	**4.32**	**0.11**	**0.21**

[1] References for wind project studies: Big Horn (Kronner et al., 2008), Biglow Canyon Phase I (Jeffrey et al., 2009; Enk et al., 2010), Biglow Canyon Phase II (Enk et al., 2011; Enk et al., 2012), Biglow Canyon Phase III (Enk et al., 2012; Enz et al., 2013), Combine Hills I (Young et al., 2006), Combine Hills I/II (Enz et al., 2012a), Echo Wind (Gritski and Downes, 2012), Goodnoe Hills (URS, 2010a), Harvest Wind (Downes and Gritski 2012a), Hay Canyon (Gritski and Kronner, 2010b); Hopkins Ridge I (Young et al., 2007, 2009), Juniper Canyon (Enz and Bay, 2012), Kittitas Valley (Stantec, 2012, Stantec 2013), Klondike I (Johnson et al., 2003), Klondike II (NWC and West, 2007), Klondike III (Gritski et al., 2010a), Klondike IIIa (Gritski et al., 2010b), Leaning Juniper I (Gritski et al., 2008), Leaning Juniper II (Downes et al., 2013), Lower Snake River (Thompson et al., 2013), Marengo I and II year 1 (URS, 2010a and b), Marengo I and II year 2 (URS, 2011a and b), Nine Canyon (Erickson et al., 2003), Pebble Springs (Gritski and Kronner, 2010a), Rattlesnake Road (Gritski et al., 2011), Star Point (Gritski and Downes, 2011b), Stateline I and 2 (Erickson et al., 2004; Erickson et al., 2007), Stateline 3 (Kronner et al., 2012), Tuolumne (Enz and Bay, 2010), Vansycle (Erickson et al., 2000), Vantage (Ventus, 2012), Wheat Field (Gritski and Downes, 2011a), White Creek Wind I (Downes and Gritski 2012b), Wild Horse (Erickson et al., 2008), Willow Creek (NWC, 2011), Windy Flats (Enz et al., 2011), Windy Pt II (Enz et al., 2012b).

[2] Huso estimator was used to determine estimated fatality rates for these projects. Schoenfeld estimator was used to determine fatality rates for other projects.

[3] For the four projects that show both the Huso and the Schoenfeld estimates, the Mean was calculated using the Huso estimate. These projects are Juniper Canyon, Leaning Juniper II, Vantage and Stateline 3.

Table 11. Observed species composition and number of avian fatalities found at Columbia Plateau Ecoregion wind projects where fatality monitoring has been completed.

Species	% Composition (Includes Scheduled Searches Only)	Number of Fatalities Found on Scheduled Searches	Number of Fatalities Found as Incidentals
Horned Lark	31.5	584	62
Golden-crowned Kinglet	5.0	93	3
Gray Partridge (*n*)	4.9	90	11
Ring-necked Pheasant (*n*)	4.2	77	16
Unidentified Bird	3.3	61	8
Western Meadowlark	3.3	61	4
Mourning Dove	3.0	55	12
European Starling (*n*)	2.8	51	11
Unidentified Passerine	2.6	49	4
Red-tailed Hawk	2.4	44	29
American Kestrel	2.3	42	16
Chukar (*n*)	2.3	42	4
Dark-eyed Junco	1.9	36	6
White-crowned Sparrow	1.6	29	3
Yellow-rumped Warbler	1.6	29	3
Townsend's Warbler	1.5	28	0
Rock Pigeon (*n*)	1.4	26	1
Ruby-crowned Kinglet	1.4	26	2
Northern Flicker	0.9	17	1
Red-breasted Nuthatch	0.8	15	0
American Robin	0.8	14	1
Pacific Wren	0.8	14	1
Barn Owl	0.7	13	2
Short-eared Owl	0.7	13	1
Swainson's Hawk	0.7	13	13
Unidentified Kinglet	0.7	13	0
Savannah Sparrow	0.6	12	0
Common Nighthawk	0.6	11	6
Common Raven	0.6	11	7
Vaux's Swift	0.6	11	2
Black-billed Magpie	0.4	8	0
House Sparrow (*n*)	0.4	8	2
House Wren	0.4	8	1
Warbling Vireo	0.4	8	0
Great Horned Owl	0.4	7	2
Rough-legged Hawk	0.4	7	5
Unidentified Sparrow	0.4	7	1
Unidentified Warbler	0.4	7	0
California Quail	0.3	6	0
Cliff Swallow	0.3	6	2
Spotted Towhee	0.3	6	3
Wilson's Warbler	0.3	6	0
Brewer's Sparrow	0.3	5	4
Chipping Sparrow	0.3	5	0
Golden-crowned Sparrow	0.3	5	0
House Finch	0.3	5	1
Northern Harrier	0.3	5	2
Orange-crowned Warbler	0.3	5	1
Vesper Sparrow	0.3	5	2
Western Tanager	0.3	5	0
American Goldfinch	0.2	4	0
Cassin's Vireo	0.2	4	0
Ferruginous Hawk	0.2	4	4
Lincoln's Sparrow	0.2	4	1
Varied Thrush	0.2	4	0

Species	% Composition (Includes Scheduled Searches Only)	Number of Fatalities Found on Scheduled Searches	Number of Fatalities Found as Incidentals
White-throated Swift	0.2	4	3
American Coot	0.2	3	0
Canada Goose	0.2	3	4
Common Poorwill	0.2	3	0
Empidonax spp.	0.2	3	0
Great Blue Heron	0.2	3	0
Long-eared Owl	0.2	3	0
MacGillivray's Warbler	0.2	3	1
Mallard	0.2	3	1
Mountain Bluebird	0.2	3	1
Red-winged Blackbird	0.2	3	0
Song Sparrow	0.2	3	1
Unidentified *Buteo*	0.2	3	0
Unidentified Duck	0.2	3	0
Unidentified *Vireo*	0.2	3	0
Western Grebe	0.2	3	2
American Pipit	0.1	2	0
Brown Creeper	0.1	2	1
Common Yellowthroat	0.1	2	0
Downy Woodpecker	0.1	2	0
Gray Flycatcher	0.1	2	0
Hammond's Flycatcher	0.1	2	1
Hermit Thrush	0.1	2	0
Lewis' Woodpecker	0.1	2	0
Northern Rough-winged Swallow	0.1	2	0
Pacific-slope Flycatcher	0.1	2	0
Pine Siskin	0.1	2	0
Purple Finch	0.1	2	0
Ring-billed Gull	0.1	2	1
Rock Wren	0.1	2	0
Sage Thrasher	0.1	2	0
Sharp-shinned Hawk	0.1	2	0
Tree Swallow	0.1	2	0
Turkey Vulture	0.1	2	2
Virginia Rail	0.1	2	0
White-breasted Nuthatch	0.1	2	0
Yellow Warbler	0.1	2	0
Accipiter spp.	0.1	1	1
American Crow	0.1	1	0
Ash-throated Flycatcher	0.1	1	0
Back-throated gray warbler	0.1	1	0
Barn Swallow	0.1	1	0
Black-throated Sparrow	0.1	1	0
Brewer's Blackbird	0.1	1	1
Brown-headed Cowbird	0.1	1	0
Bullock's Oriole	0.1	1	0
Burrowing Owl	0.1	1	0
Cooper's Hawk	0.1	1	0
Eastern Kingbird	0.1	1	0
Fox Sparrow	0.1	1	0
Golden Eagle	0.1	1	3
Grasshopper Sparrow	0.1	1	0
Hairy Woodpecker	0.1	1	0
Horned Grebe	0.1	1	0
Killdeer	0.1	1	0
Long-billed Curlew	0.1	1	1
Merlin	0.1	1	0
Northern Bobwhite	0.1	1	0
Northern Pintail	0.1	1	0

Species	% Composition (Includes Scheduled Searches Only)	Number of Fatalities Found on Scheduled Searches	Number of Fatalities Found as Incidentals
Northern Shrike	0.1	1	0
Olive-sided flycatcher	0.1	1	0
Peregrine Falcon	0.1	1	0
Prairie Falcon	0.1	1	3
Red-naped Sapsucker	0.1	1	0
Say's Phoebe	0.1	1	0
Swainson's Thrush	0.1	1	1
Townsend's Solitaire	0.1	1	0
Unidentified Gull	0.1	1	0
Unidentified Owl	0.1	1	0
Unidentified Swallow	0.1	1	0
Unidentified Thrush	0.1	1	0
Western Kingbird	0.1	1	0
Western Screech-owl	0.1	1	1
Western Wood-pewee	0.1	1	0
Bufflehead	0.0	0	1
Cackling Goose	0.0	0	1
Gray Catbird	0.0	0	1
Lark Sparrow	0.0	0	1
Sagebrush Sparrow	0.0	0	1
Williamson's Sapsucker	0.0	0	1
Total (122 species identified) (116 native identified, 6 non-native)	**100.0**	**1852**	**295**

n = non-native species

[1] References for wind project studies: Big Horn (Kronner et al., 2008), Biglow Canyon Phase I (Jeffrey et al., 2009; Enk et al., 2010), Biglow Canyon Phase II (Enk et al., 2011; Enk et al., 2012), Biglow Canyon Phase III (Enk et al., 2012' Enz et al., 2013), Combine Hills I (Young et al., 2006), Combine Hills I/II (Enz et al., 2012a), Echo Wind (Gritski and Downes, 2012), Goodnoe Hills (URS, 2010a), Harvest Wind (Downes and Gritski 2012a), Hay Canyon (Gritski and Kronner, 2010b); Hopkins Ridge I (Young et al., 2007, 2009), Juniper Canyon (Enz and Bay, 2012), Kittitas Valley (Stantec, 2012, Stantec 2013), Klondike I (Johnson et al., 2003), Klondike II (NWC and West, 2007), Klondike III (Gritski et al., 2010a), Klondike IIIa (Gritski et al., 2010b), Leaning Juniper I (Gritski et al., 2008), Leaning Juniper II (Downes et al., 2013), Lower Snake River (Thompson et al., 2013), Marengo I and II year 1 (URS, 2010a and b), Marengo I and II year 2 (URS, 2011a and b), Nine Canyon (Erickson et al., 2003), Pebble Springs (Gritski and Kronner, 2010a), Rattlesnake Road (Gritski et al., 2011), Star Point (Gritski and Downes, 2011b), Stateline I and 2 (Erickson et al., 2004; Erickson et al., 2007), Stateline 3 (Kronner et al., 2012), Tuolumne (Enz and Bay, 2010), Vansycle (Erickson et al., 2000), Vantage (Ventus, 2012), Wheat Field (Gritski and Downes, 2011a), White Creek Wind I (Downes and Gritski 2012b), Wild Horse (Erickson et al., 2008), Willow Creek (NWC, 2011), Windy Flats (Enz et al., 2011), Windy Pt II (Enz et al., 2012b).

Table 12. Reported mean annual fatality estimates on a per turbine and per MW nameplate basis for all bats in the Columbia Plateau Ecoregion where wildlife fatality monitoring studies have been completed and reports are public.

Wind Project[1] Listed in order of highest to lowest mean bat fatality rate per MW/year (first column)	Mean Number of Bat Fatalities per MW / Year	Mean Number of Bat Fatalities per Turbine / Year
Rattlesnake Road, OR[2]	2.87	6.03
Biglow Canyon, OR (Phase II, Year 1)	2.71	6.24
Nine Canyon I, WA	2.47	3.21
White Creek Wind I, WA[2]	2.04	4.70
Biglow Canyon, OR (Phase I, Year 1)	1.99	3.29
Leaning Juniper I, OR[2]	1.98	2.97
Big Horn, WA[2]	1.90	2.86
Combine Hills I, OR (2004/2005 study year)	1.88	1.88
Juniper Canyon, WA (Huso)[2]	1.82	4.38
Stateline I and 2, OR/WA (2001–2003 study)	1.70	1.12
Juniper Canyon, WA	1.60	3.85
Pebble Springs, OR[2]	1.55	3.25
Stateline 3, OR[2]	1.44	3.31
Hopkins Ridge I, WA (Phase 1, Year 2)	1.39	2.50
Harvest Wind, WA[2]	1.28	2.94
Stateline 3, OR	1.18	2.72
Klondike III, OR (Phase 1)[2]	1.17	2.07
Vansycle, OR	1.12	0.74
Echo Wind, OR[2]	0.99	1.72
Stateline 1 and 2, OR/WA (2006)	0.95	0.63
Tuolumne, WA	0.94	2.07
Willow Creek Wind, OR[2]	0.81	1.22
Klondike I, OR	0.77	1.16
Combine Hills I/II, OR (2011 study year)	0.73	0.73
Lower Snake River, WA	0.70	1.62
Wheat Field, OR[2]	0.69	1.46
Biglow Canyon, OR (Phase III, Year 2)	0.66	1.52
Vantage, WA[2]	0.65	0.98
Hopkins Ridge I, WA (Phase 1, Year 1)	0.63	1.13
Leaning Juniper II, OR[2]	0.63	1.08
Leaning Juniper II, OR	0.60	1.04
Biglow Canyon, OR (Phase I, Year 2)	0.58	0.96
Biglow Canyon, OR (Phase II, Year 2)	0.57	1.32
Hay Canyon, OR[2]	0.53	1.12
Star Point, OR[2]	0.48	1.00
Klondike II, OR	0.41	0.63
Windy Flats, WA (Year 1)	0.41	0.95
Vantage, WA	0.40	0.60
Wild Horse, WA	0.39	0.70

Wind Project[1] Listed in order of highest to lowest mean bat fatality rate per MW/year (first column)	**Mean Number of Bat Fatalities per MW / Year**	**Mean Number of Bat Fatalities per Turbine / Year**
Goodnoe Hills, WA	0.34	0.68
Kittitas Valley, WA (Year 2)[2]	0.31	0.66
Marengo II, WA (Year 1)	0.27	0.49
Biglow Canyon, OR (Phase III, Year 1)	0.22	0.51
Marengo I, WA (Year 1)	0.17	0.31
Klondike IIIa, OR (Phase 2)[2]	0.16	0.24
Marengo I, WA (Year 2)	0.15	0.27
Kittitas Valley, WA (Year 1)[2]	0.12	0.26
Marengo II, WA (Year 2)	0.00	0.00
Mean[3]	**0.99**	**1.74**

Footnotes from Table 12

[1] References for wind project studies: Big Horn (Kronner et al., 2008), Biglow Canyon Phase I (Jeffrey et al., 2009; Enk et al., 2010), Biglow Canyon Phase II (Enk et al., 2011; Enk et al., 2012), Biglow Canyon Phase III (Enk et al., 2012; Enz et al., 2013), Combine Hills I (Young et al., 2006), Combine Hills I/II (Enz et al., 2012a), Echo Wind (Gritski and Downes, 2012), Goodnoe Hills (URS, 2010a), Harvest Wind (Downes and Gritski 2012a), Hay Canyon (Gritski and Kronner, 2010b); Hopkins Ridge I (Young et al., 2007, 2009), Juniper Canyon (Enz and Bay, 2012), Kittitas Valley (Stantec, 2012, Stantec 2013), Klondike I (Johnson et al., 2003), Klondike II (NWC and West, 2007), Klondike III (Gritski et al., 2010a), Klondike IIIa (Gritski et al., 2010b), Leaning Juniper I (Gritski et al., 2008), Leaning Juniper II (Downes et al., 2013), Lower Snake River (Thompson et al., 2013), Marengo I and II year 1 (URS, 2010a and b), Marengo I and II year 2 (URS, 2011a and b), Nine Canyon (Erickson et al., 2003), Pebble Springs (Gritski and Kronner, 2010a), Rattlesnake Road (Gritski et al., 2011), Star Point (Gritski and Downes, 2011b), Stateline I and 2 (Erickson et al., 2004; Erickson et al., 2007), Stateline 3 (Kronner et al., 2012), Tuolumne (Enz and Bay, 2010), Vansycle (Erickson et al., 2000), Vantage (Ventus, 2012), Wheat Field (Gritski and Downes, 2011a), White Creek Wind I (Downes and Gritski 2012b), Wild Horse (Erickson et al., 2008), Willow Creek (NWC, 2011), Windy Flats (Enz et al., 2011), Windy Pt II (Enz et al., 2012b).

[2] Huso estimator was used to determine estimated fatality rates for these projects. Schoenfeld estimator was used to determine fatality rates for other projects.

[3] For the four projects that show both the Huso and the Schoenfeld estimates, the Mean was calculated using the Huso estimate. These projects are Juniper Canyon, Leaning Juniper II, Vantage and Stateline 3.

Table 13. Observed species composition and number of bat fatalities found at Columbia Plateau Ecoregion wind projects where fatality monitoring has been completed and reports are public.*

Species (in descending order of Composition)	%	% Composition Found (Includes Standardized Searches Only)	Number of Fatalities Found on Standardized Searches	Number of Fatalities Found Incidentally
Hoary Bat		50.2	371	63
Silver-haired Bat		44.9	332	60
Unidentified Bat		2.4	18	11
Big Brown Bat		1.0	7	0
Little Brown Bat		1.0	7	0
Myotis spp.		0.4	3	0
Totals		**100.0**	**738**	**134**

* Projects included are those for which fatality monitoring used similar methods, has been completed, and had been made publically available (by May 2014).

[1] References for wind project studies: Big Horn (Kronner et al., 2008), Biglow Canyon Phase I (Jeffrey et al., 2009; Enk et al., 2010), Biglow Canyon Phase II (Enk et al., 2011; Enk et al., 2012), Biglow Canyon Phase III (Enk et al., 2012; Enz et al., 2013), Combine Hills I (Young et al., 2006), Combine Hills I/II (Enz et al., 2012a), Echo Wind (Gritski and Downes, 2012), Goodnoe Hills (URS, 2010a), Harvest Wind (Downes and Gritski 2012a), Hay Canyon (Gritski and Kronner, 2010b); Hopkins Ridge I (Young et al., 2007, 2009), Juniper Canyon (Enz and Bay, 2012), Kittitas Valley (Stantec, 2012, Stantec 2013), Klondike I (Johnson et al., 2003), Klondike II (NWC and West, 2007), Klondike III (Gritski et al., 2010a), Klondike IIIa (Gritski et al., 2010b), Leaning Juniper I (Gritski et al., 2008), Leaning Juniper II (Downes et al., 2013), Lower Snake River (Thompson et al., 2013), Marengo I and II year 1 (URS, 2010a and b), Marengo I and II year 2 (URS, 2011a and b), Nine Canyon (Erickson et al., 2003), Pebble Springs (Gritski and Kronner, 2010a), Rattlesnake Road (Gritski et al., 2011), Star Point (Gritski and Downes, 2011b), Stateline I and 2 (Erickson et al., 2004; Erickson et al., 2007), Stateline 3 (Kronner et al., 2012), Tuolumne (Enz and Bay, 2010), Vansycle (Erickson et al., 2000), Vantage (Ventus, 2012), Wheat Field (Gritski and Downes, 2011a), White Creek Wind I (Downes and Gritski 2012b), Wild Horse (Erickson et al., 2008), Willow Creek (NWC, 2011), Windy Flats (Enz et al., 2011), Windy Pt II (Enz et al., 2012b).

9.0 FIGURES

Figure 1. Wheatridge Wind Energy Facility and Vicinity.

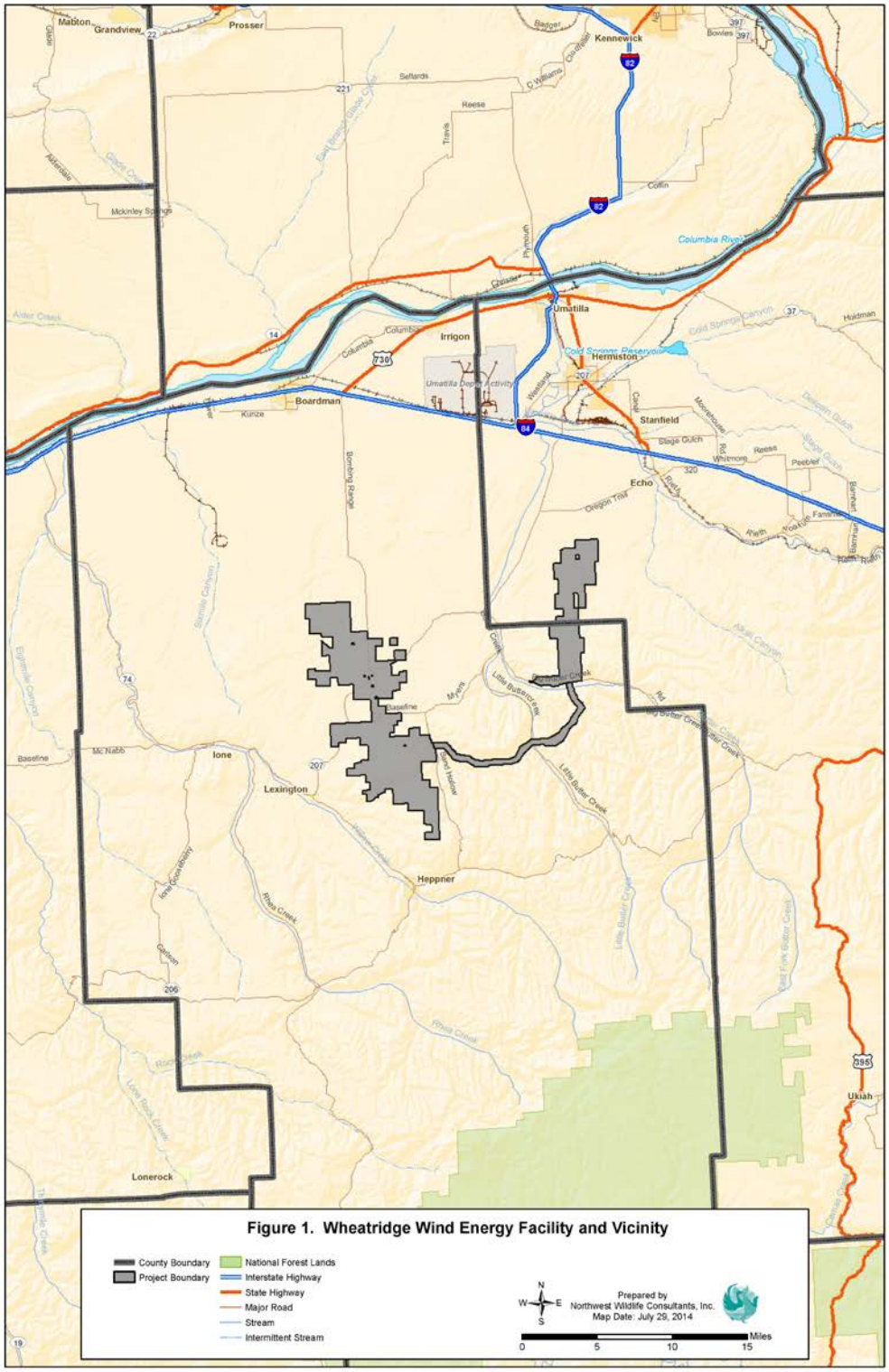


Figure 2. Wheatridge Wind Energy Facility Threatened and Endangered Species analysis area and ODFW deer and elk winter range.

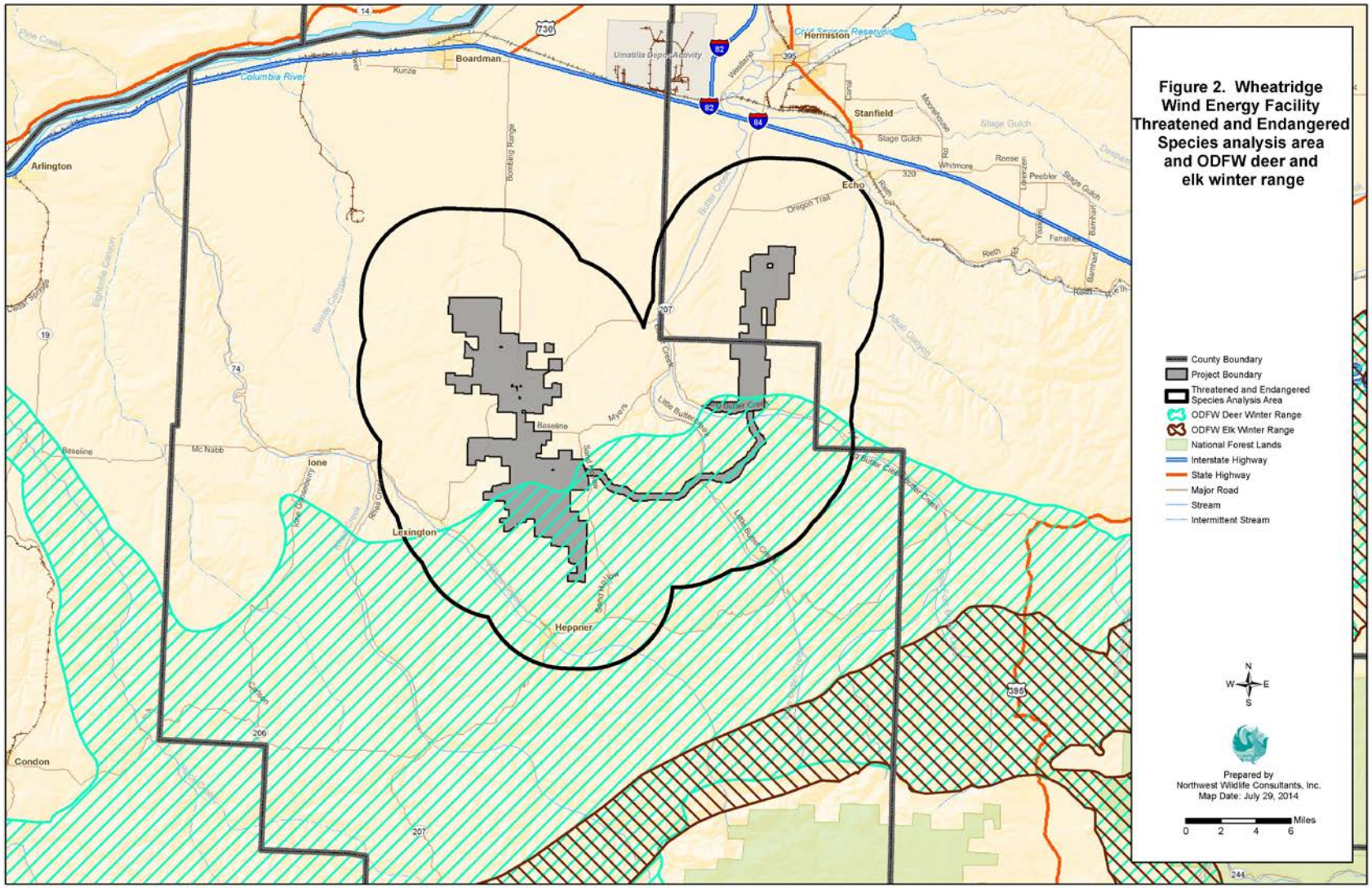


Figure 3a. Habitat types and subtypes at the Wheatridge West portion of the Wheatridge Wind Energy Facility.

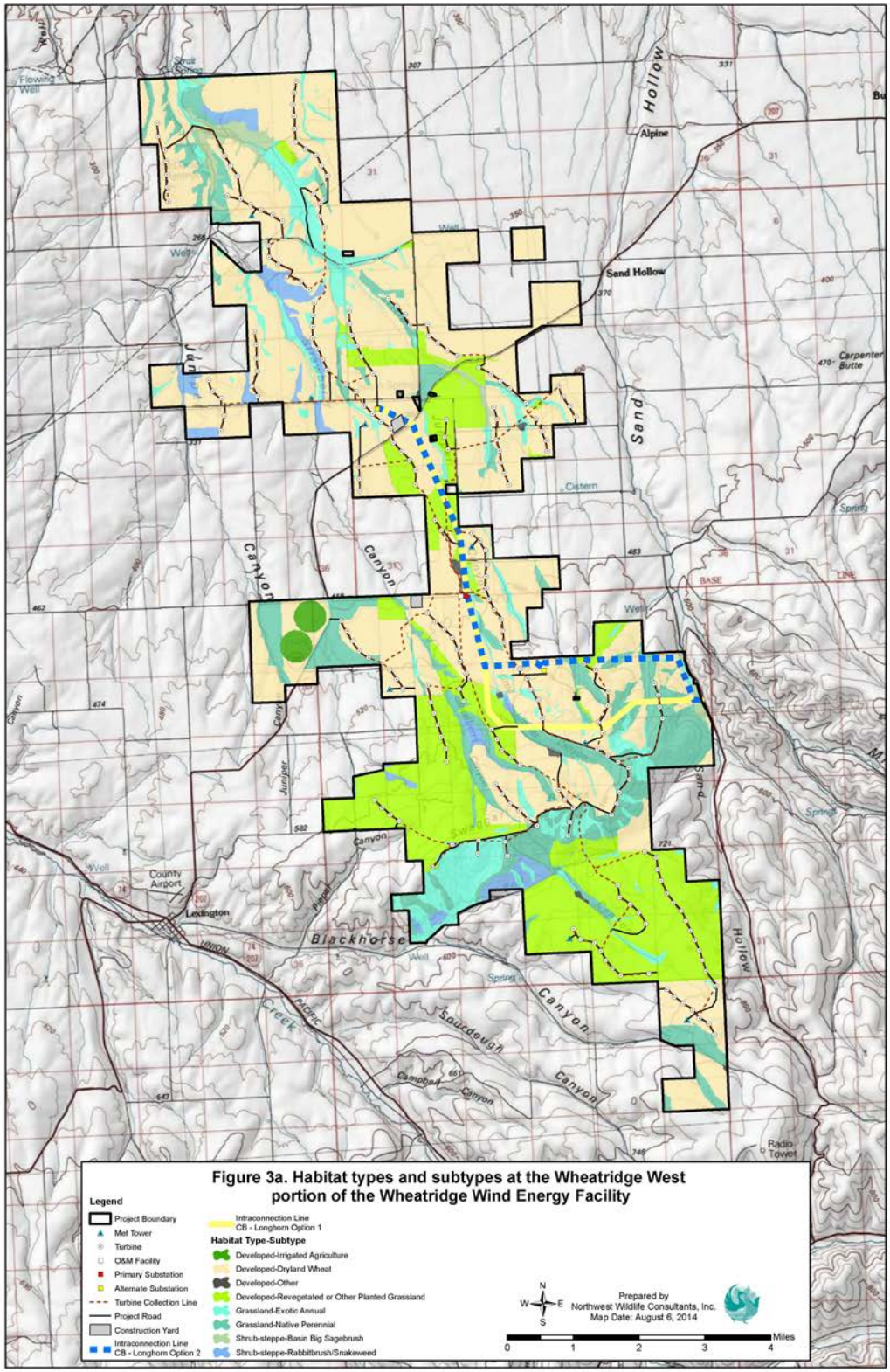


Figure 3b. Habitat types and subtypes at the Wheatridge East portion of the Wheatridge Wind Energy Facility.

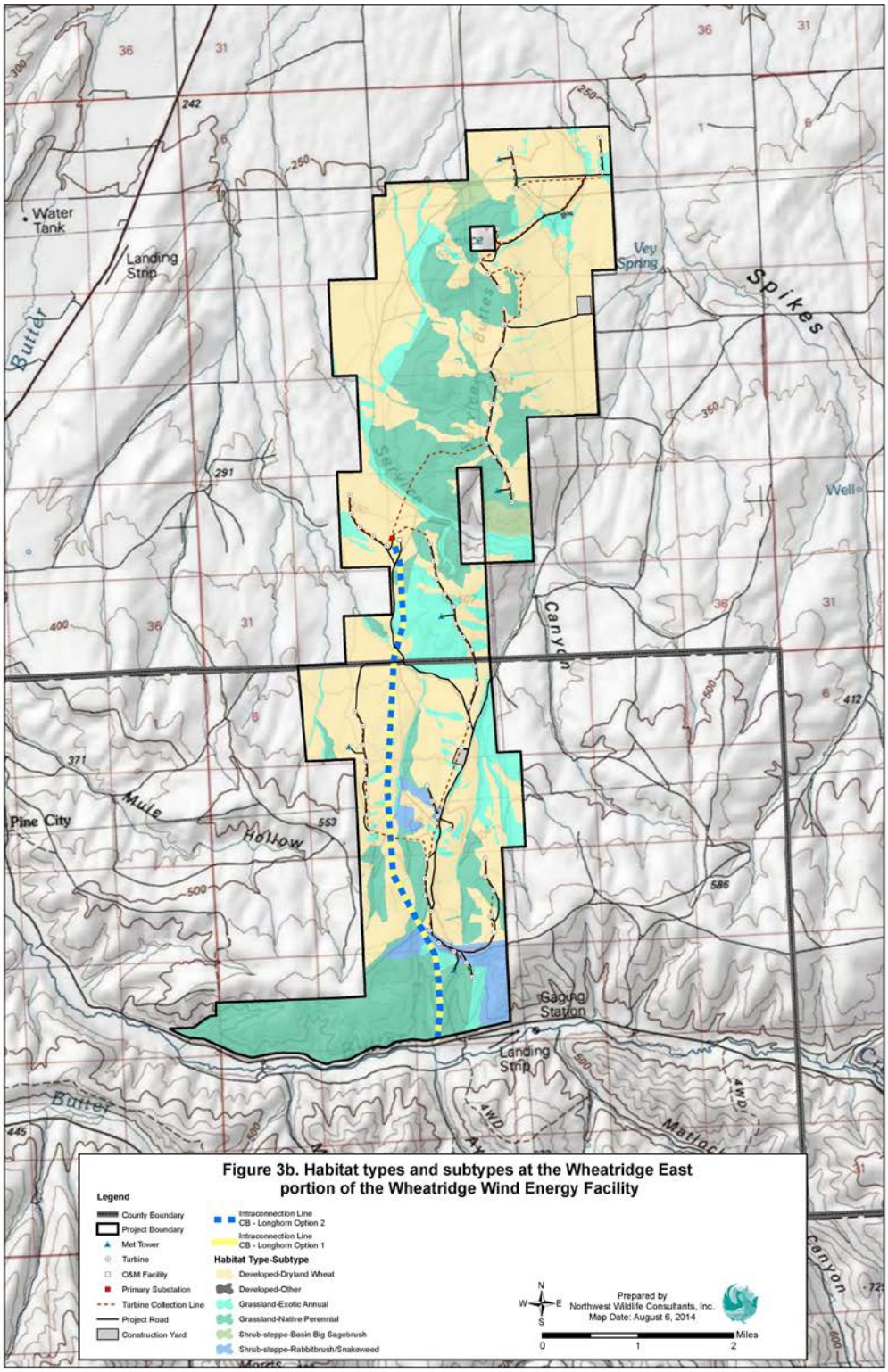


Figure 3c. Habitat types and subtypes at the Wheatridge Wind Energy Project transmission Intraconnection Corridor.

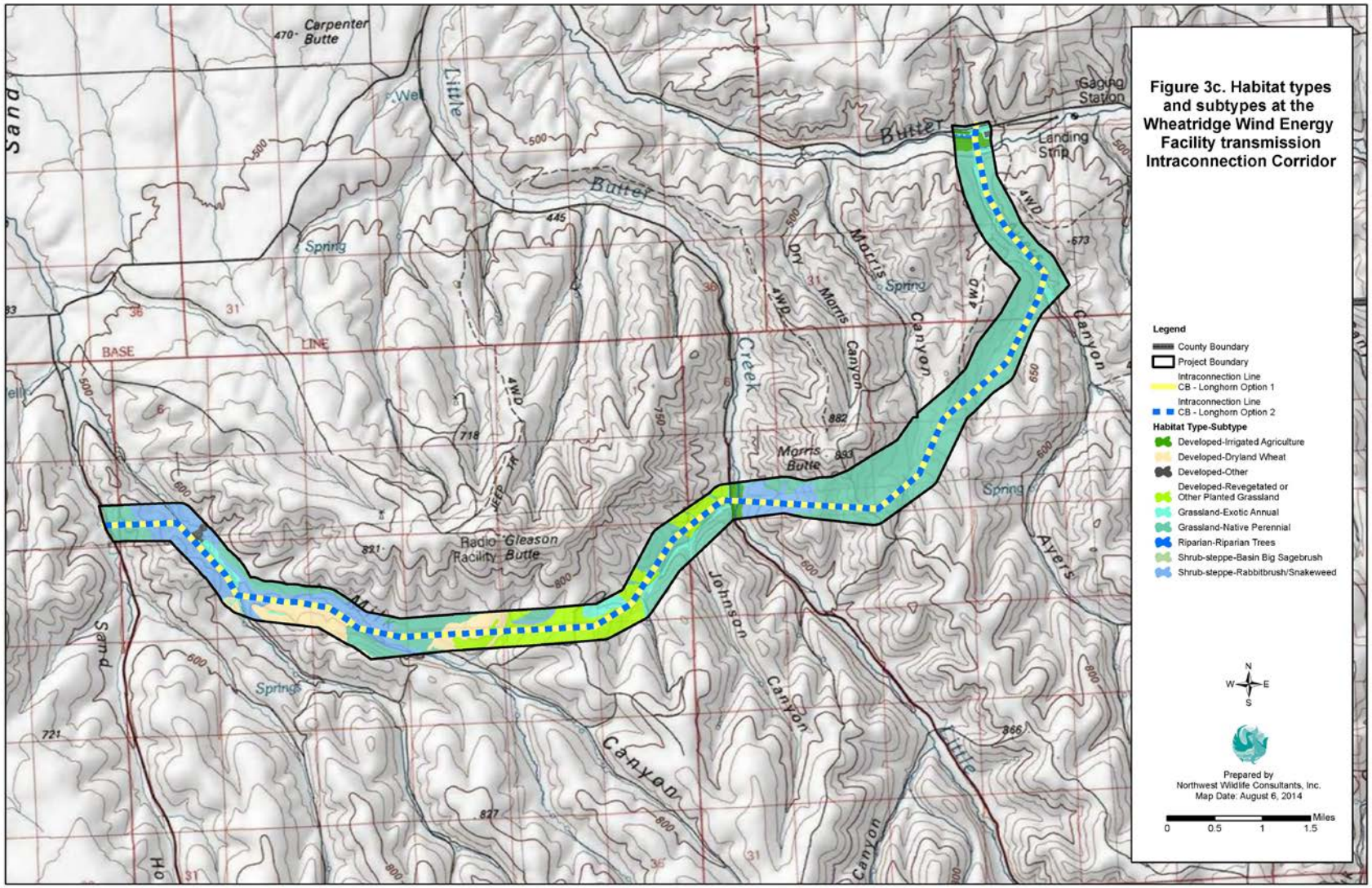


Figure 4a. Habitat categories within survey corridors at the Wheatridge West portion of the Wheatridge Wind Energy Facility. ***(Note: For calculating mitigation acres, all habitat south of (green) mule deer winter range boundary is considered Category 2.)***

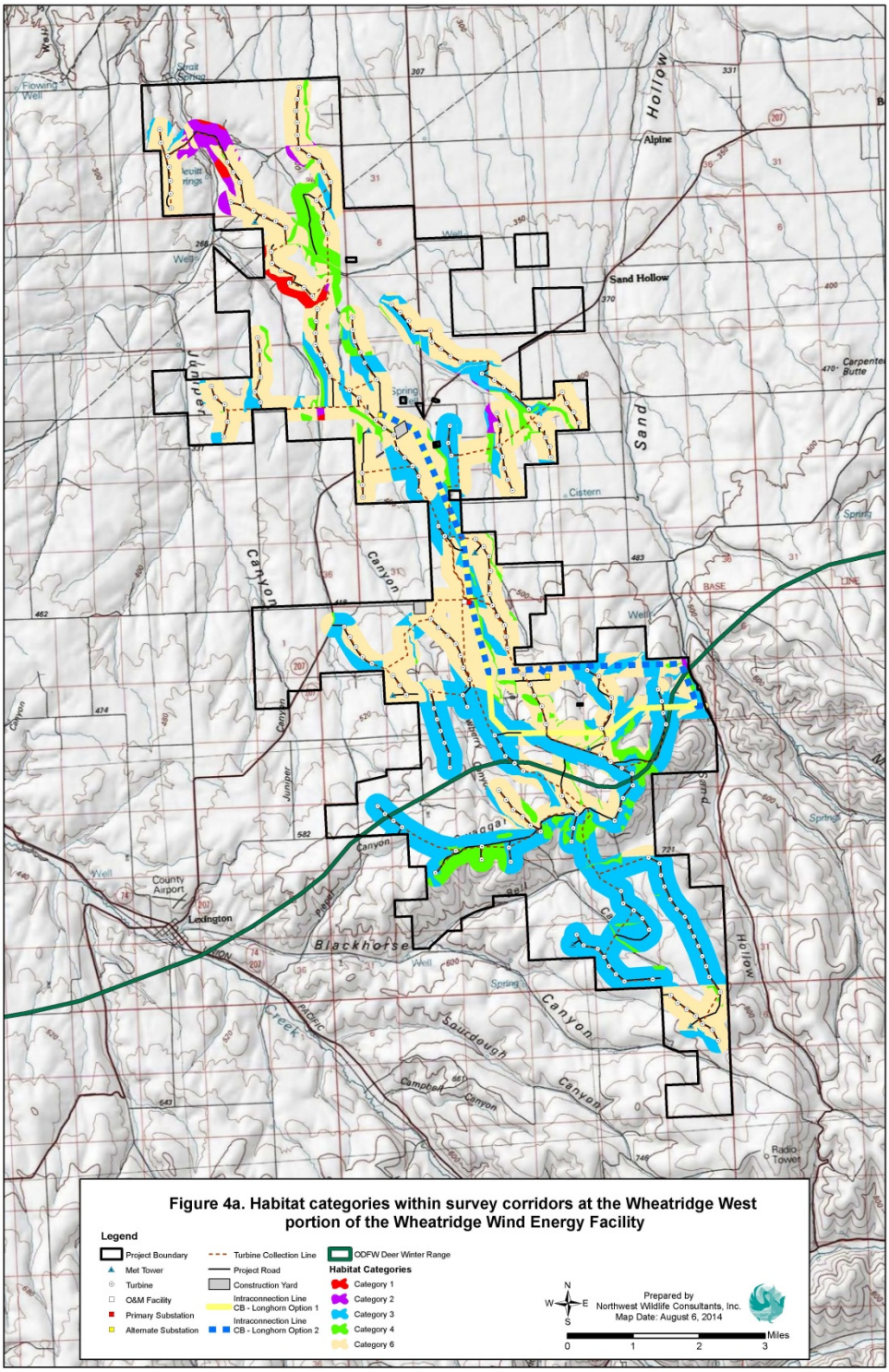


Figure 4b. Habitat categories within survey corridors at the Wheatridge East portion of the Wheatridge Wind Energy Facility. ***(Note: For calculating mitigation acres, all habitat south of (green) mule deer winter range boundary is considered Category 2.)***

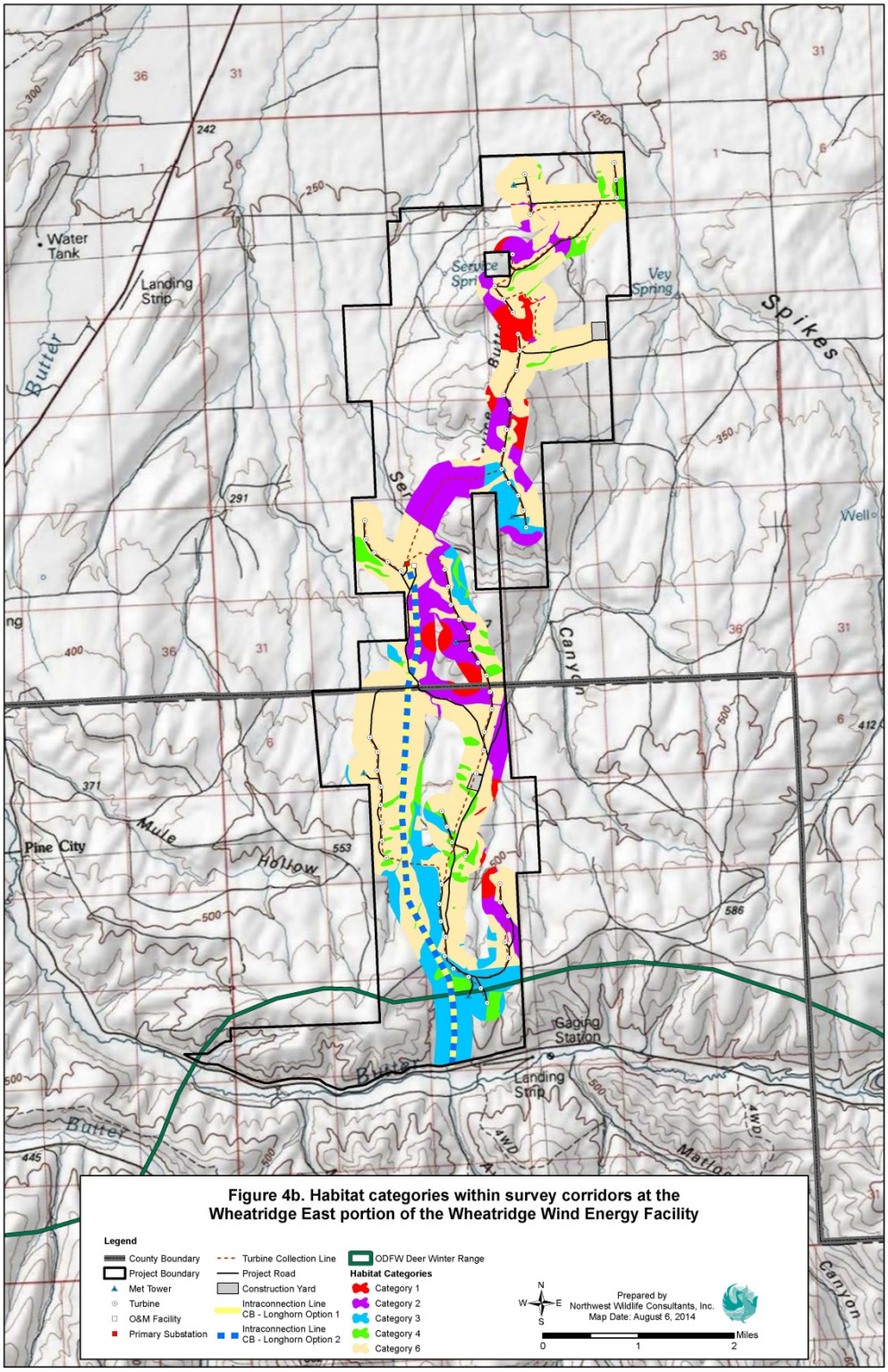


Figure 4c. Habitat categories within the Wheatridge Wind Energy Facility transmission Intraconnection Corridor. ***(Note: For calculating mitigation acres, all habitat shown here is in mule deer winter range and considered Category 2.)***

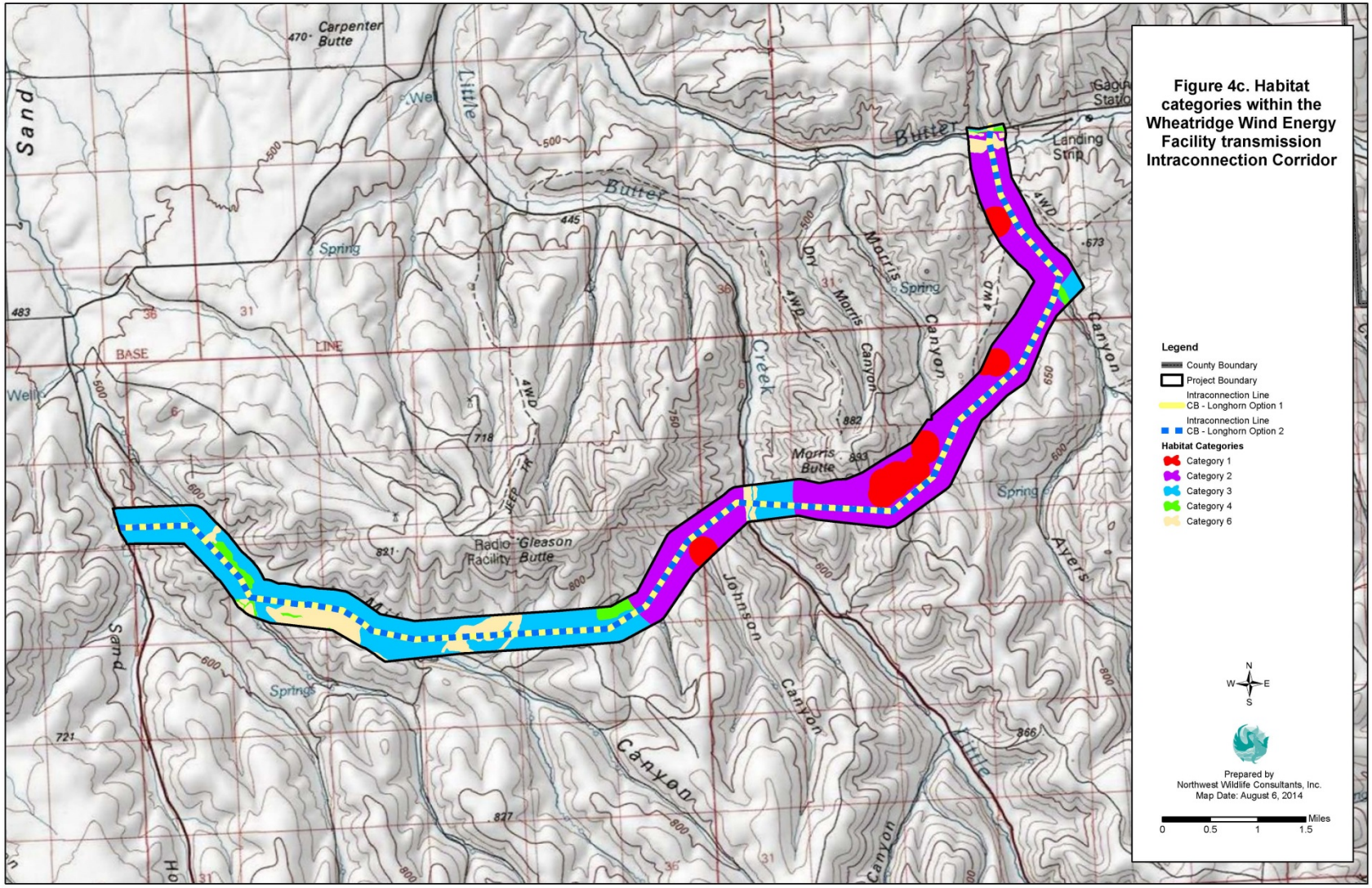


Figure 5a. Rare plants found during surveys at the Wheatridge West portion of the Wheatridge Wind Energy Facility, May through July, 2011 and 2013.

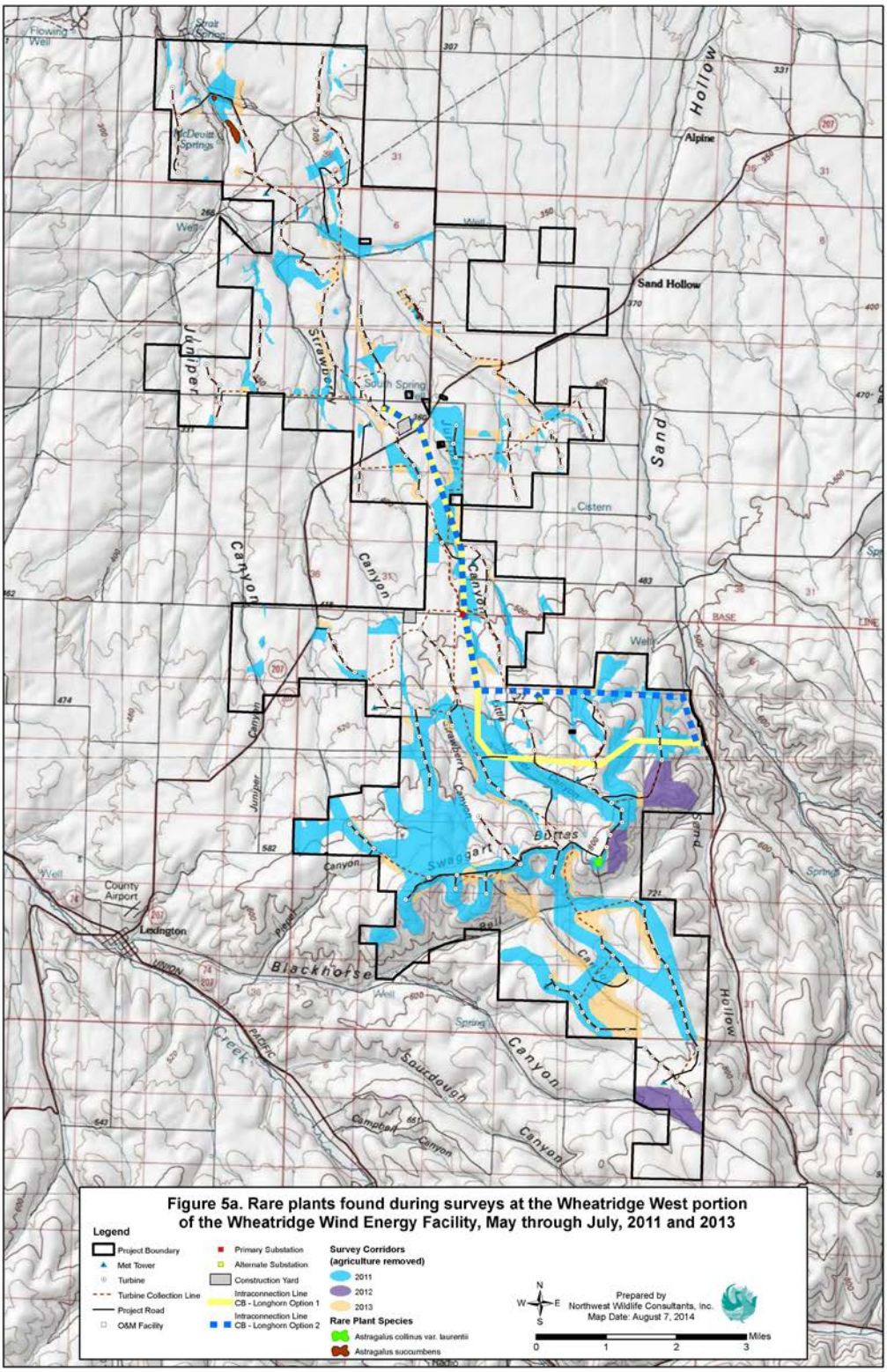


Figure 5b. Rare plants found during surveys at the Wheatridge East portion of the Wheatridge Wind Energy Facility, May through July, 2011 and 2013.

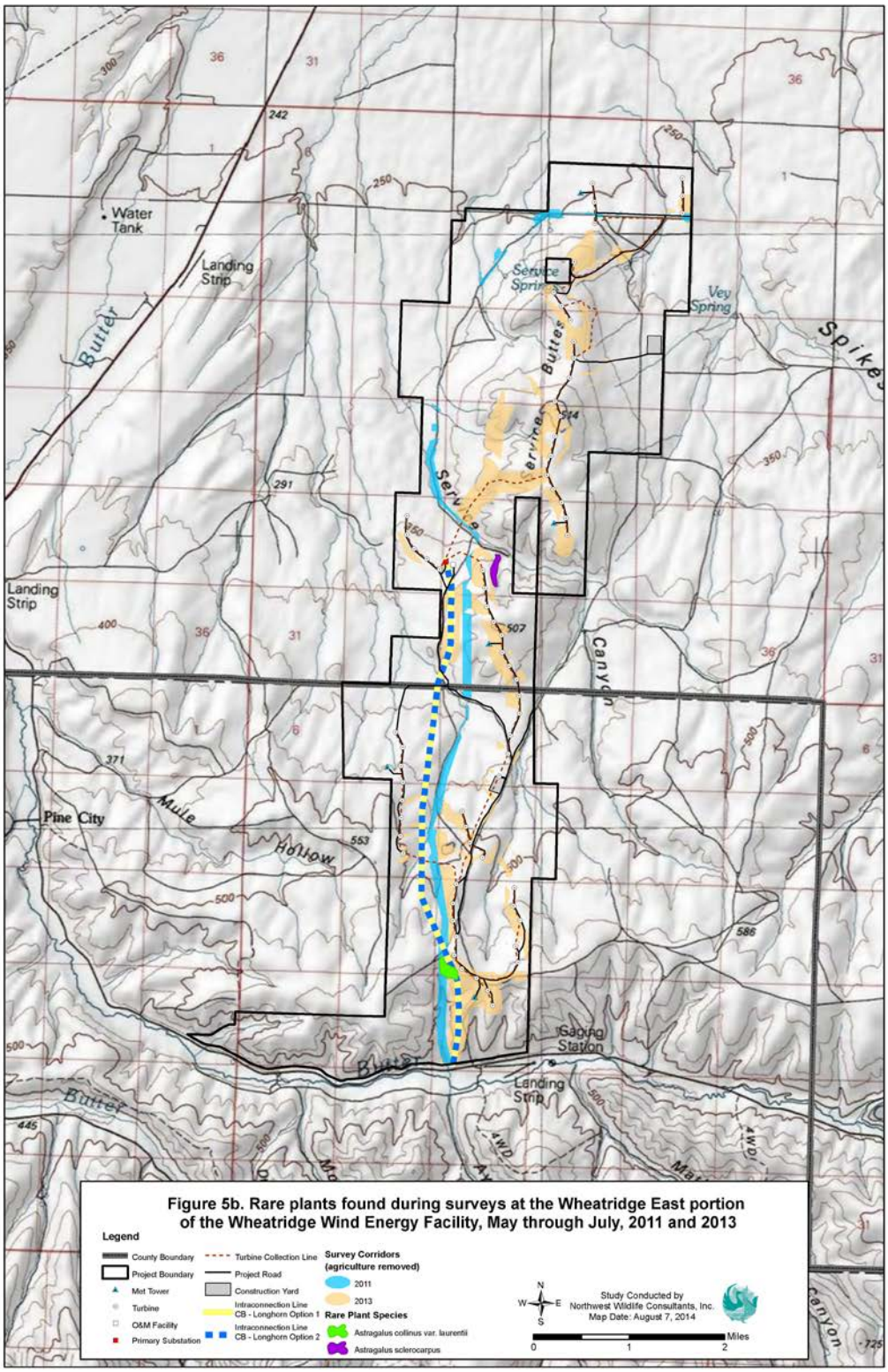


Figure 5c. Rare plants found during surveys at the Wheatridge Wind Energy Facility transmission Intraconnection Corridor, May through July, 2011 and 2013.

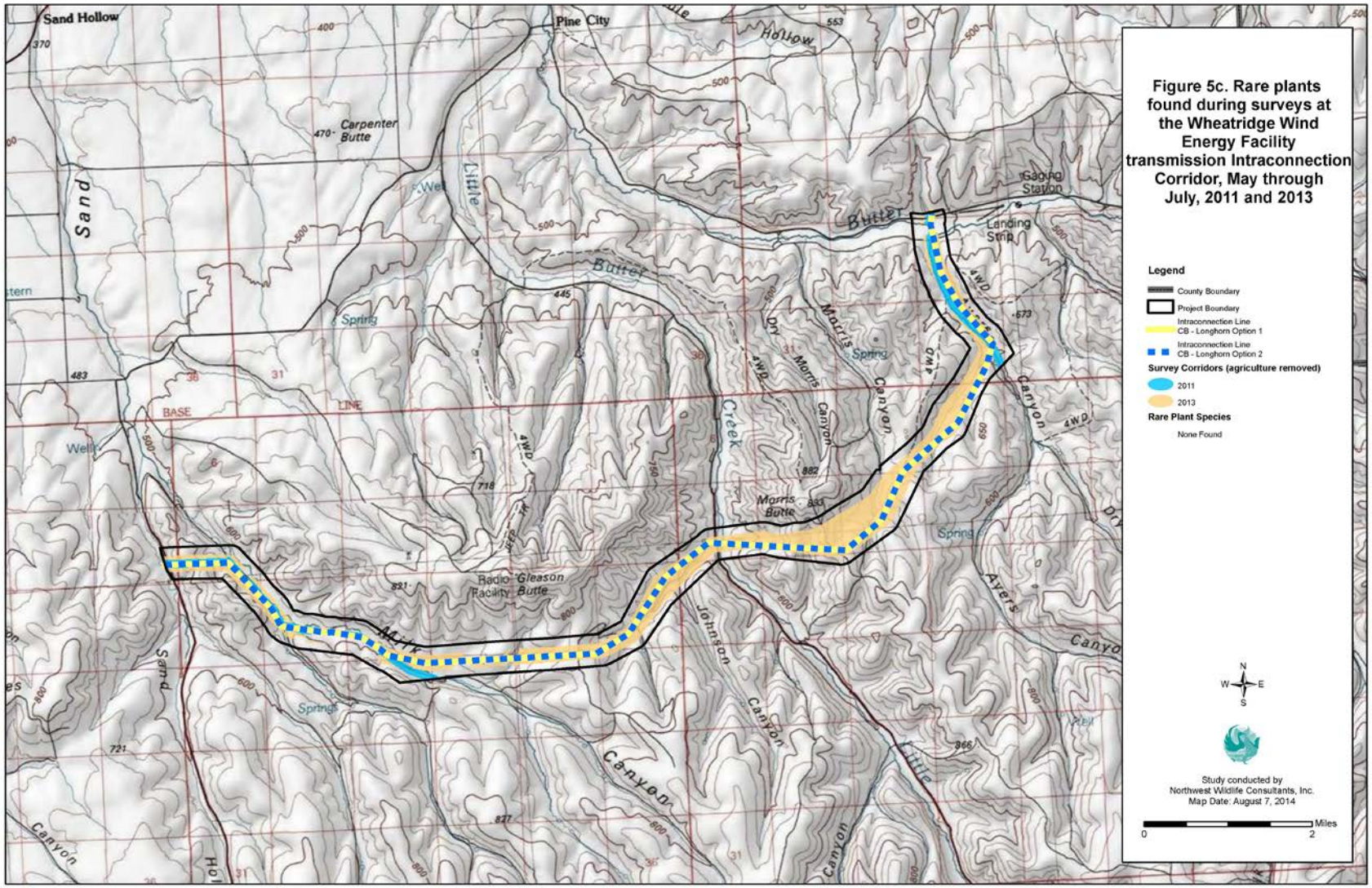


Figure 6a. Avian use study plots at Wheatridge West portion of the Wheatridge Wind Energy Facility, February 2011 through February 2012.

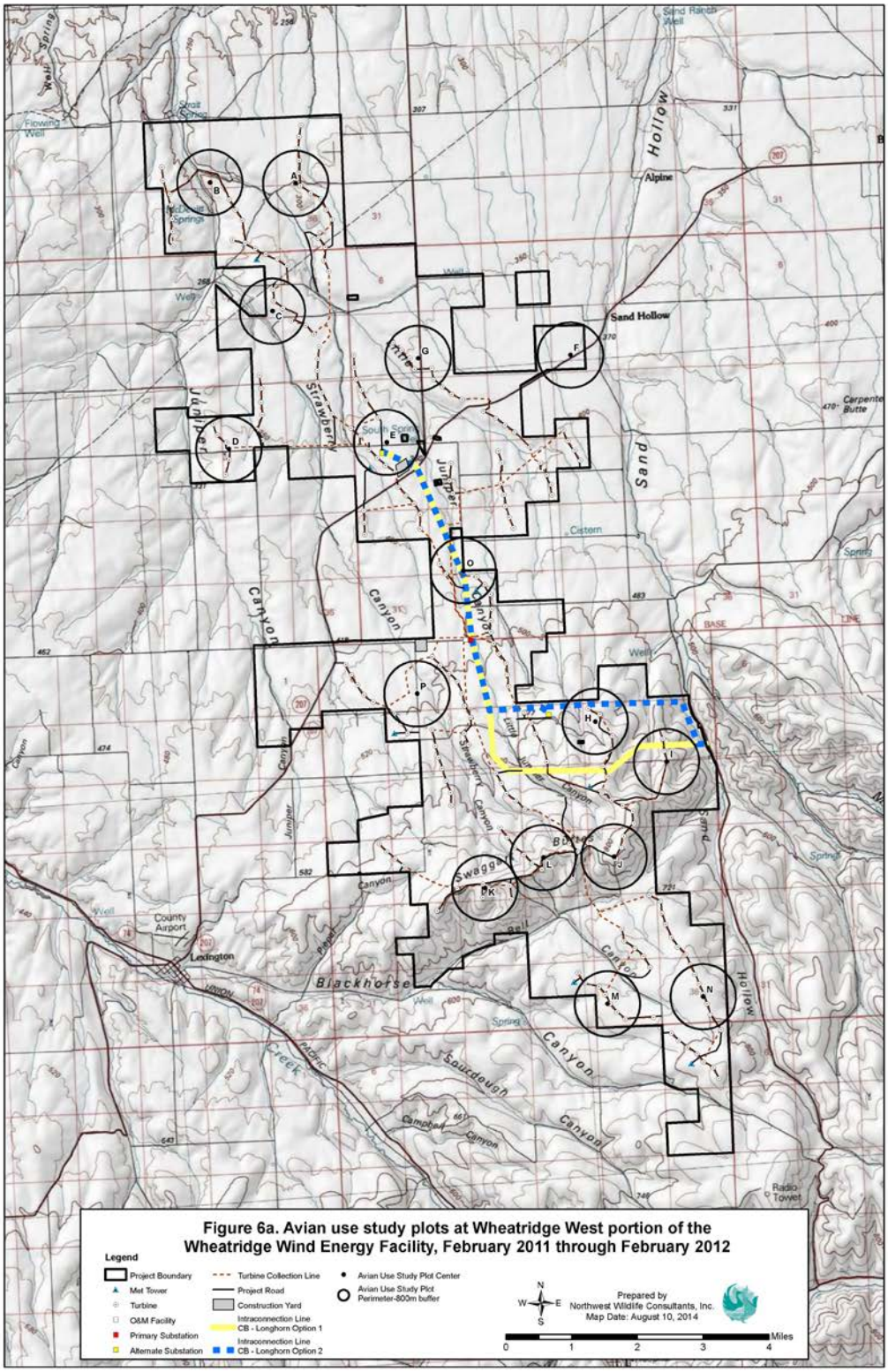


Figure 6b. Avian use study plots at Wheatridge East portion of the Wheatridge Wind Energy Facility, February 2011 through February 2012.

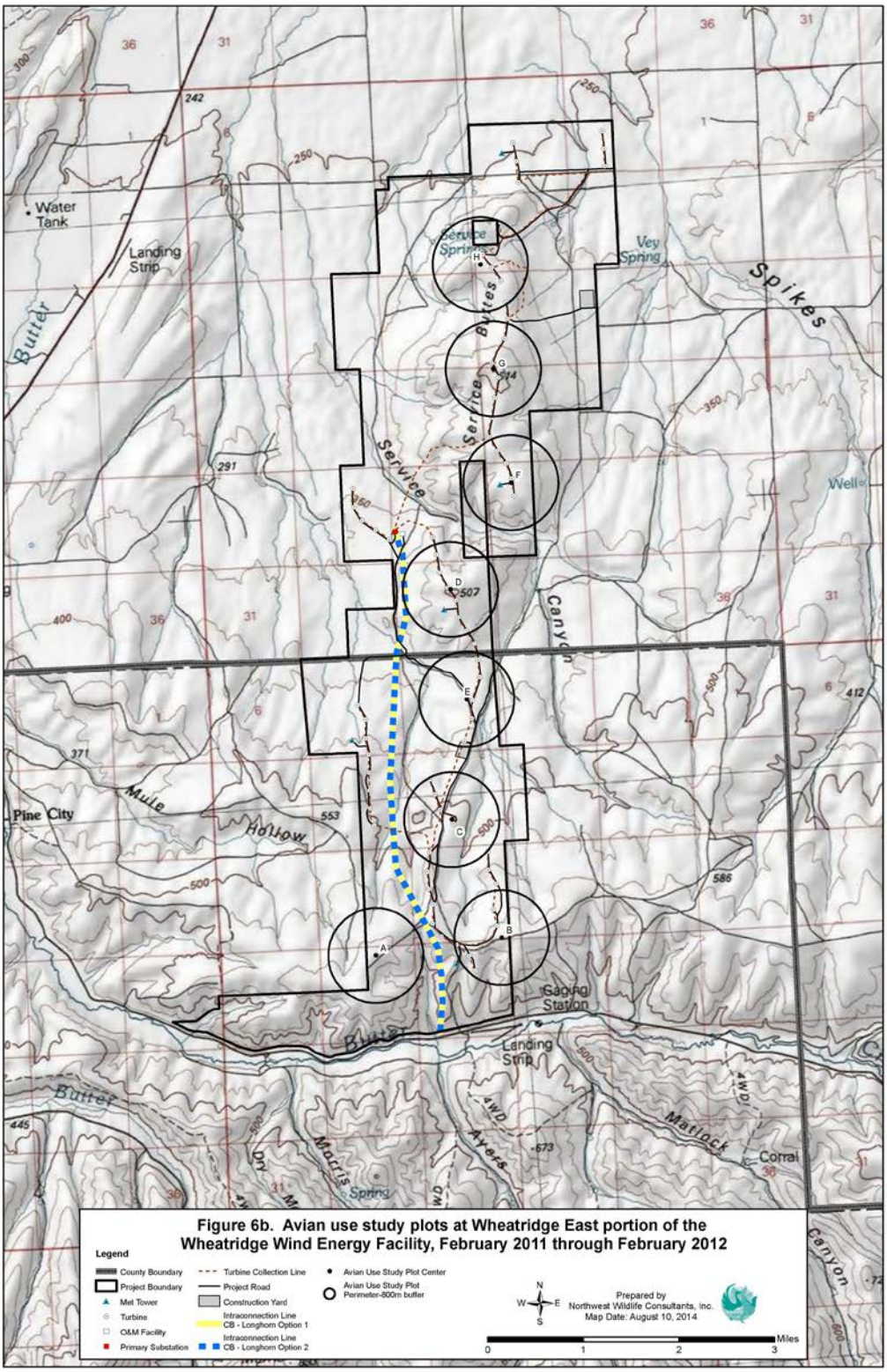


Figure 7a. Raptor and other large bird nests within two miles of Wheatridge West portion of the Wheatridge Wind Energy Facility. (Confidential—submitted separately to USFWS and ODFW)

Figure 7b. Raptor and other large bird nests within two miles of Wheatridge East portion of the Wheatridge Wind Energy Facility. (Confidential—submitted separately to USFWS and ODFW)

Figure 7c. Raptor and other large bird nests within two miles of the Wheatridge Wind Energy Facility transmission Intraconnection Corridor. (Confidential—submitted separately to USFWS and ODFW)

Figure 8. Eagle nests within ten miles of the Wheatridge Wind Energy Facility. (Confidential—submitted separately to USFWS and ODFW)

Figure 9a. Category 1 habitat associated with detections of Washington ground squirrels at Wheatridge West portion of the Wheatridge Wind Energy Facility. (Confidential—submitted separately to USFWS and ODFW)

Figure 9b. Category 1 habitat associated with detections of Washington ground squirrels at Wheatridge East portion of the Wheatridge Wind Energy Facility. (Confidential—submitted separately to USFWS and ODFW)

Figure 9c. Category 1 habitat associated with detections of Washington ground squirrels at Wheatridge Wind Energy Facility transmission Intraconnection Corridor. (Confidential—submitted separately to USFWS and ODFW)

Figure 10a. Soil types and subtypes associated with detections of Washington ground squirrels at Wheatridge West portion of the Wheatridge Wind Energy Facility. (Confidential—submitted separately to USFWS and ODFW)

Figure 10b. Soil types and subtypes associated with detections of Washington ground squirrels at Wheatridge East portion of the Wheatridge Wind Energy Facility. (Confidential—submitted separately to USFWS and ODFW)

Figure 10c. Soil types and subtypes associated with detections of Washington ground squirrels at Wheatridge Wind Energy Facility transmission Intraconnection Corridor. (Confidential—submitted separately to USFWS and ODFW)

Figure 11a. Special status vertebrate wildlife species (excluding Washington ground squirrel) detections at Wheatridge West portion of the Wheatridge Wind Energy Facility.

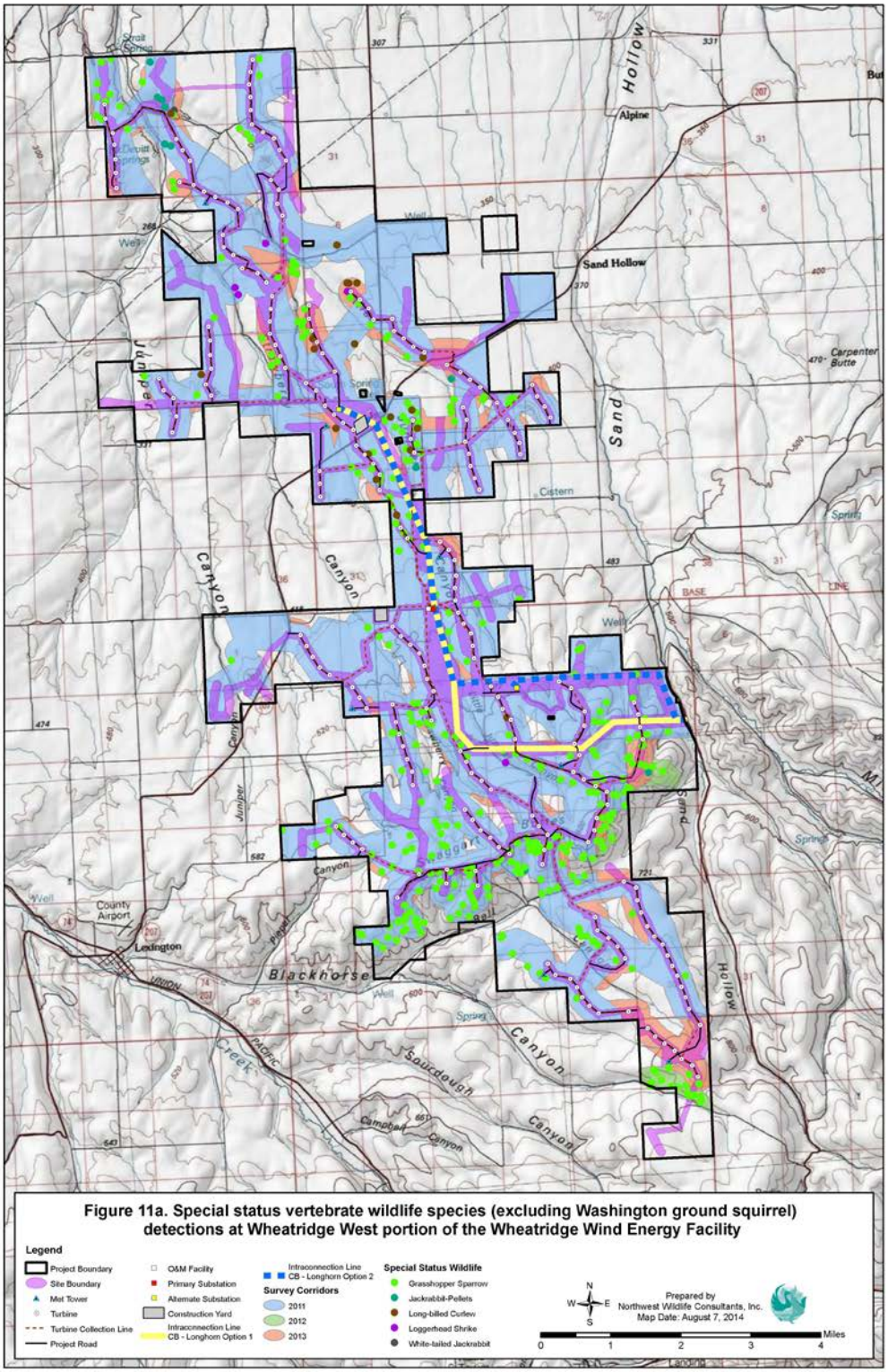


Figure 11b. Special status vertebrate wildlife species (excluding Washington ground squirrel) detections at Wheatridge East portion of the Wheatridge Wind Energy Facility.

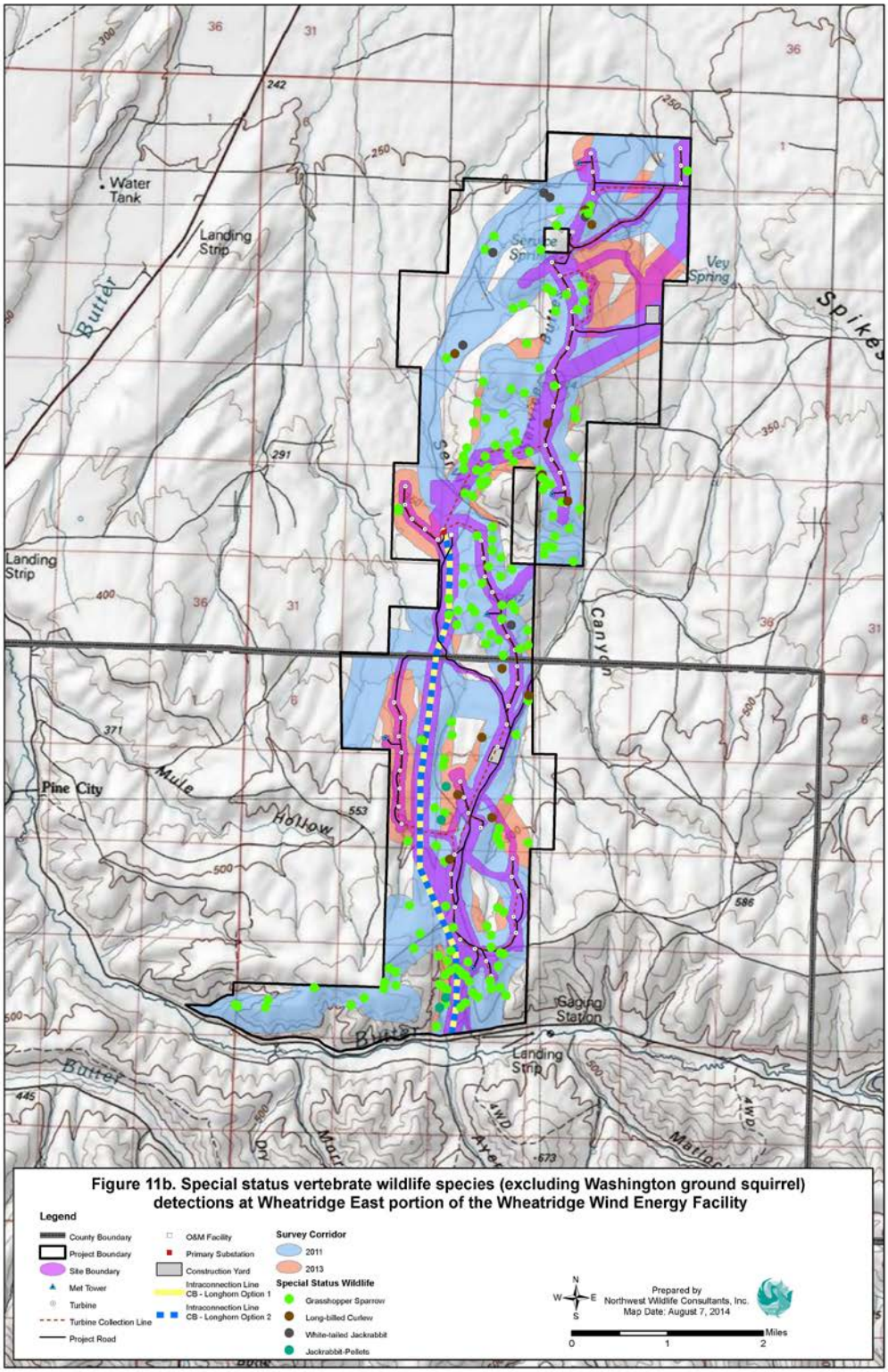


Figure 11c. Special status vertebrate wildlife species (excluding Washington ground squirrel) detections at Wheatridge Wind Energy Facility transmission Intraconnection Corridor.

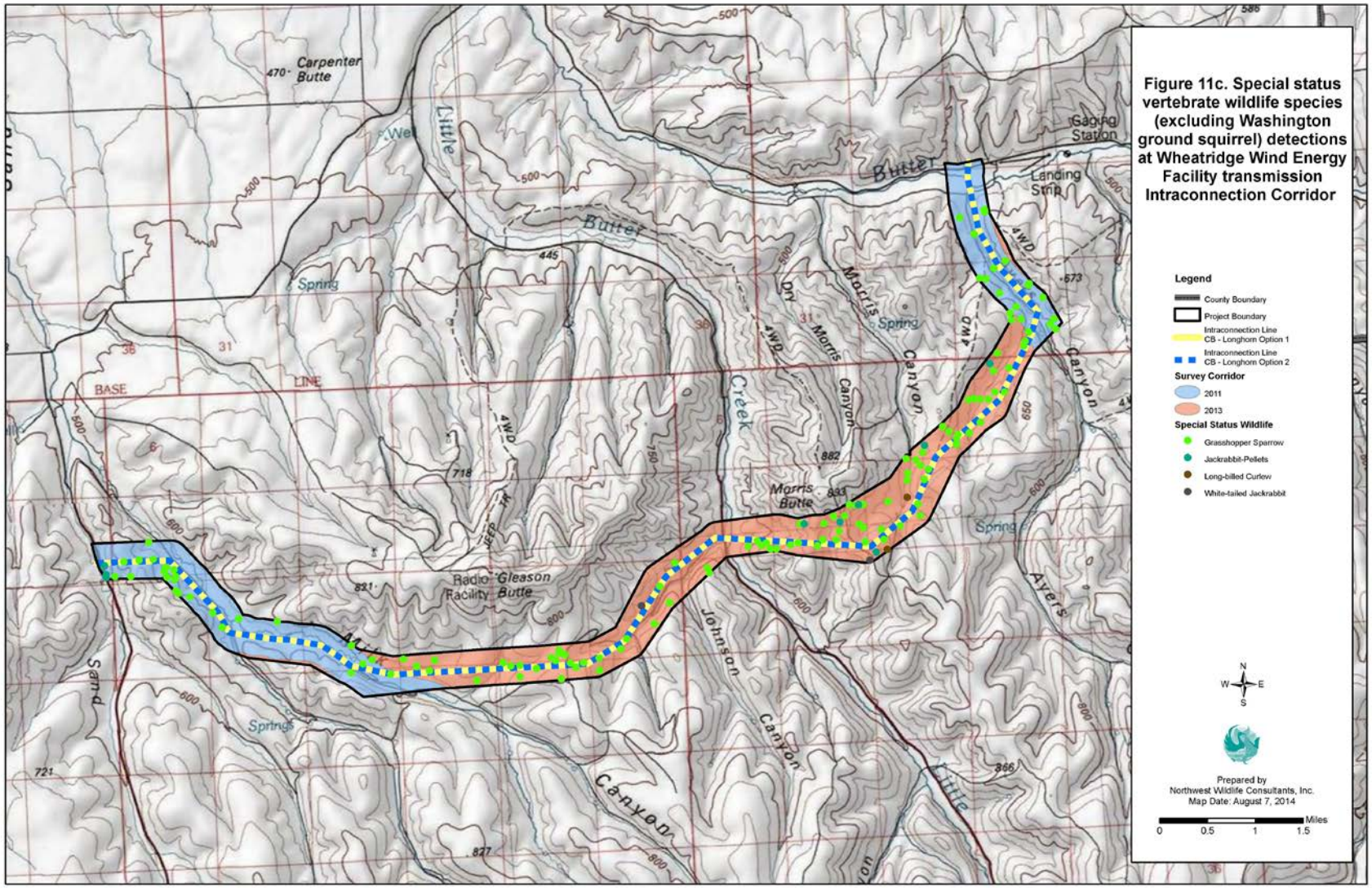


Figure 12a. Bat monitoring locations at Wheatridge West portion of the Wheatridge Wind Energy Facility during bat species investigation, July through October 2011.

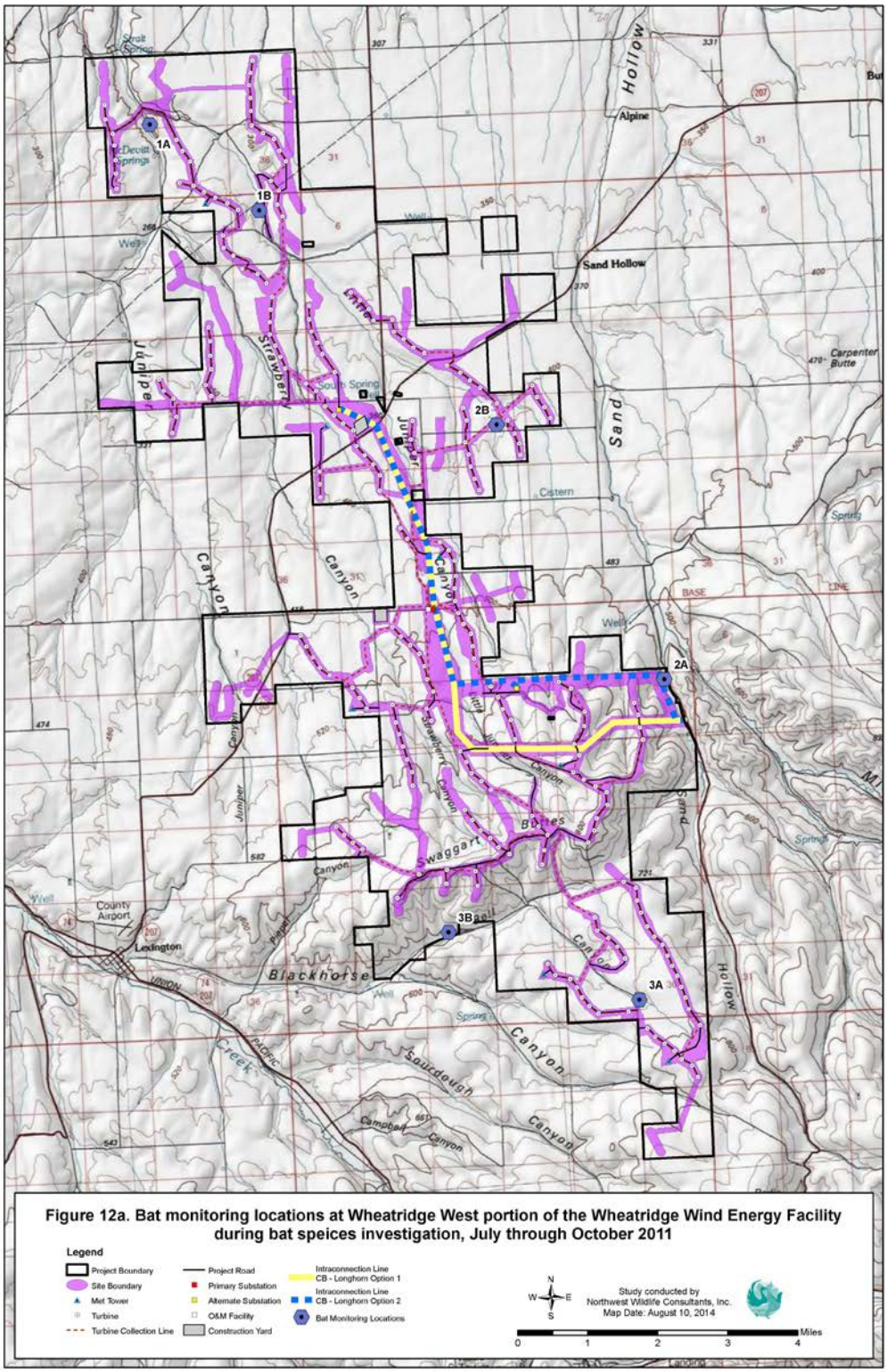


Figure 12b. Bat monitoring locations at Wheatridge East portion of the Wheatridge Wind Energy Facility during bat species investigation, July through October 2011.

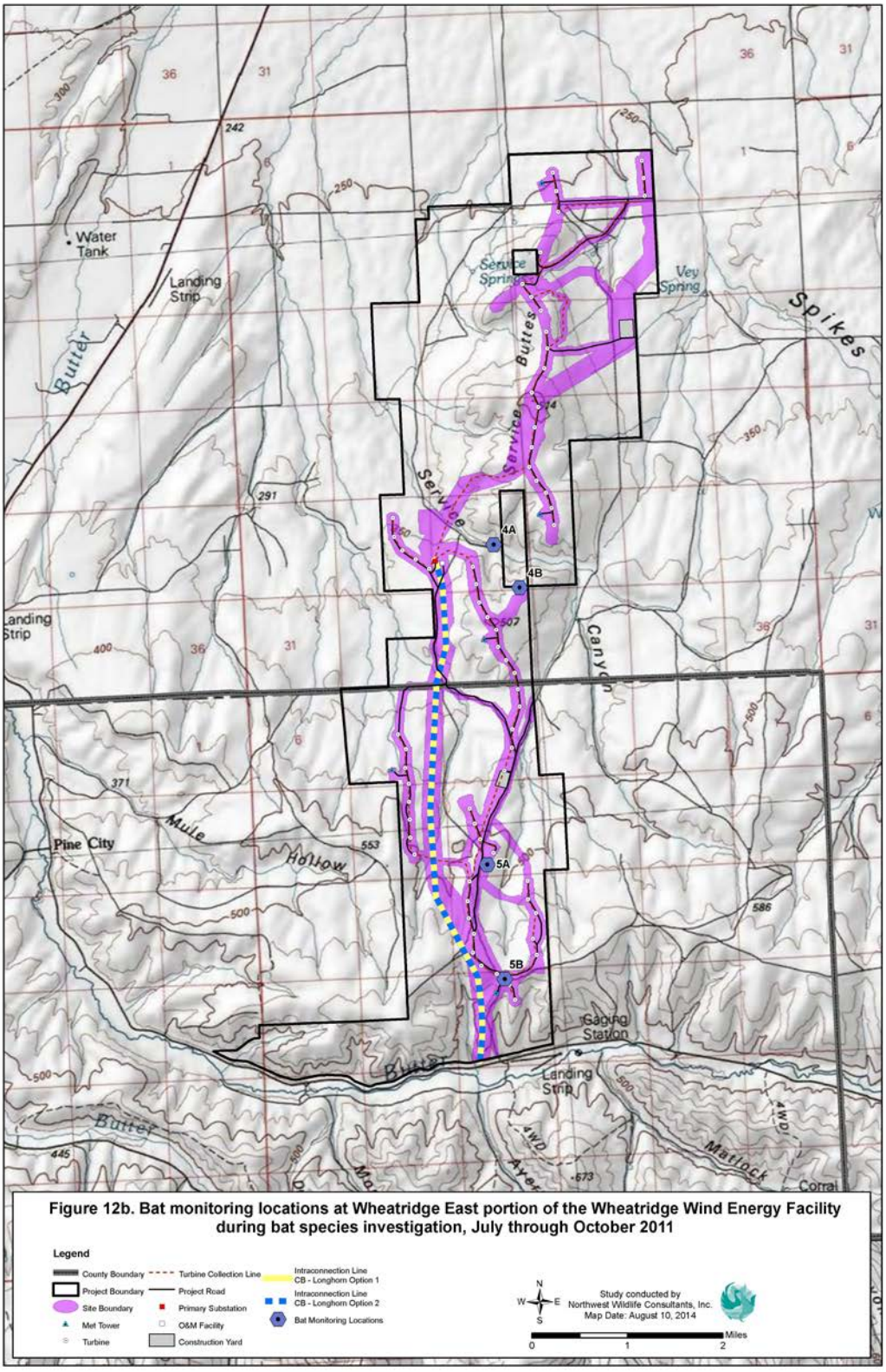


Figure 12c. Bat monitoring locations at Wheatridge Wind Energy Facility transmission Intraconnection Corridor during bat species investigation, July through October 2011.

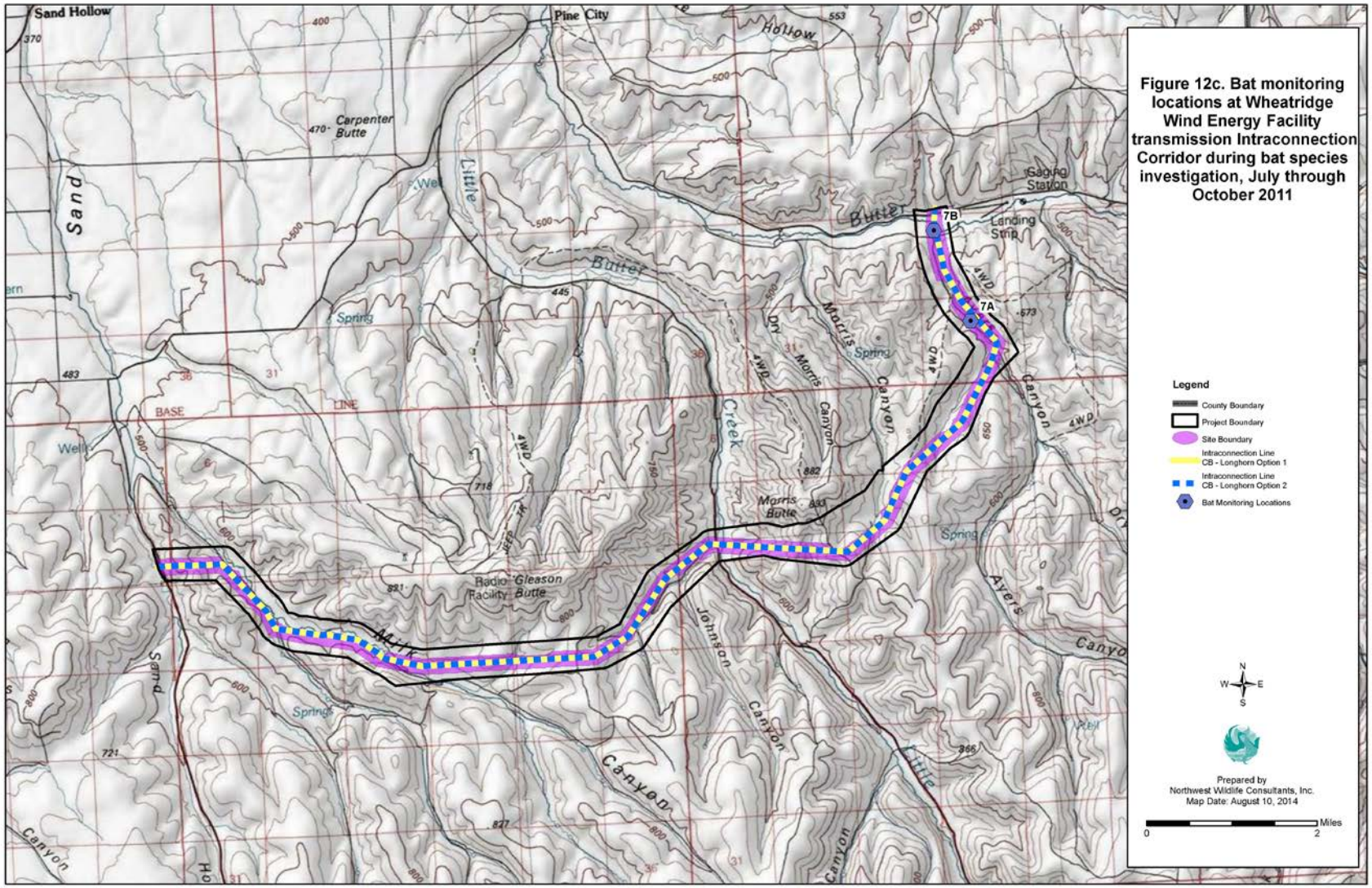
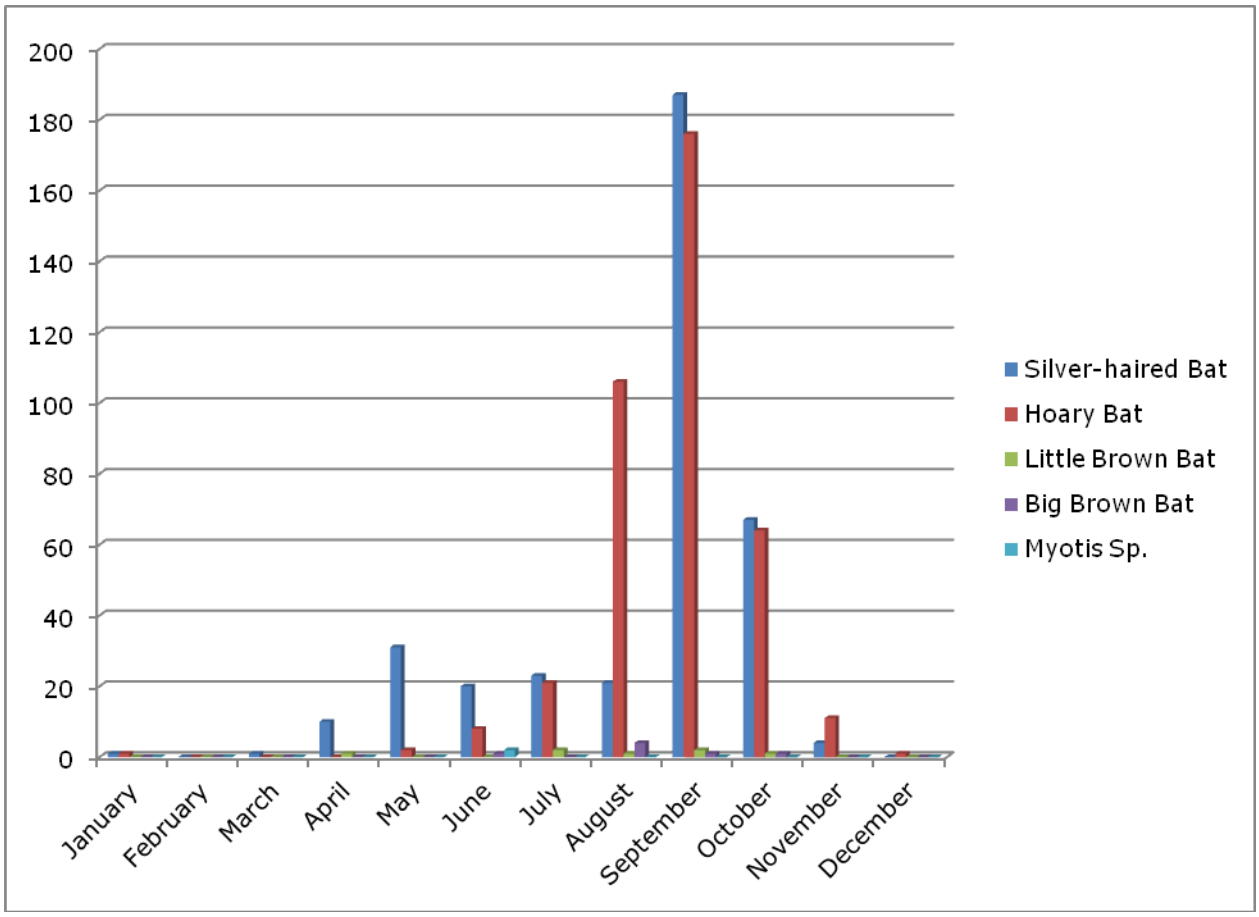


Figure 13. Observed bat fatalities by month at Columbia Plateau Ecoregion wind projects where fatality monitoring has been completed.



Data used are dates when bat fatality was discovered with no adjustment for age of carcass when found. Includes incidentals. References for projects included: Big Horn (Kronner et al., 2008), Biglow Canyon Phase I (Jeffrey et al., 2009), Biglow Canyon Phase III (Enk et al., 2012), Combine Hills I (Young et al., 2006), Combine Hills I/II (Enz et al., 2012a), Echo Wind (Gritski and Downes, 2012), Goodnoe Hills (URS, 2010a), Harvest Wind (Downes and Gritski 2012a), Hay Canyon (Gritski and Kronner, 2010b); Hopkins Ridge I (Young et al., 2007, 2009), Juniper Canyon (Enz and Bay, 2012), Kittitas Valley (Stantec, 2012, Stantec 2013), Klondike I (Johnson et al., 2003), Klondike II (NWC and West, 2007), Klondike III (Gritski et al., 2010a), Klondike IIIa (Gritski et al., 2010b), Leaning Juniper I (Gritski et al., 2008), Leaning Juniper II (Downes et al., 2013), Lower Snake River (Thompson et al., 2013), Marengo I and II year 1 (URS, 2010a and b), Marengo I and II year 2 (URS, 2011a and b), Nine Canyon (Erickson et al., 2003), Pebble Springs (Gritski and Kronner, 2010a), Rattlesnake Road (Gritski et al., 2011), Star Point (Gritski and Downes, 2011b), Stateline I and 2 (Erickson et al., 2004; Erickson et al., 2007), Stateline 3 (Kronner et al., 2012), Vansycle (Erickson et al., 2000), Vantage (Ventus, 2012), Wheat Field (Gritski and Downes, 2011a), White Creek Wind I (Downes and Gritski 2012b), Wild Horse (Erickson et al., 2008), Willow Creek (NWC, 2011), Windy Flats (Enz et al., 2011), Windy Pt II (Enz et al., 2012b).

10.0 APPENDICES

Appendix A. Oregon Biodiversity Information Center response letter, March 18, 2011.

OREGON BIODIVERSITY INFORMATION CENTER

Institute for Natural Resources
Portland State UNIVERSITY
Mail Stop: INR
Post Office Box 751
Portland, Oregon 97207
503.725.9950
http://orbic.pdx.edu

March 18, 2011

Tamiko Ruhlen
Northwest Wildlife Consultants, Inc.
815 NW 4th Street
Pendleton, OR 97801

Dear Ms. Ruhlen:

Thank you for requesting information from the Oregon Biodiversity Information Center (ORBIC). We have conducted a data system search for rare, threatened and endangered plant and animal records for your Wheatridge Wind Project in portions of Morrow and Umatilla Counties.

Ninety-four (94) element occurrence records were noted within the provided project buffer and are included on the enclosed computer printout and GIS shapefile.

Please remember that a lack of rare element information from a given area does not necessarily indicate there are no significant elements present, only that there is no information known to us from the site. To ensure there are no significant elements present that may be affected by your project, you should inventory the site during the appropriate season.

This data is confidential and for the specific purposes of your project and is **not to be distributed**. Please also note that as our database is continually updated, the data in this report should be considered current for a maximum of one year from the date it was generated and should not be cited thereafter.

Please forward the included invoice to the appropriate party in your organization for payment.

If you need additional information or have any further questions, please do not hesitate to contact me.

Sincerely,

Cliff Alton
Conservation Information Assistant
cliff.alton@pdx.edu
503.725.9952

encl.: **invoice (H-031811-CWA01)**
computer printout and data key
GIS shapefile

Appendix B1. United State Fish and Wildlife Service Morrow County species list (USFWS, 2012b).

FEDERALLY LISTED, PROPOSED, CANDIDATE SPECIES
AND SPECIES OF CONCERN
UNDER THE JURISDICTION OF THE FISH AND WILDLIFE SERVICE
WHICH MAY OCCUR WITHIN MORROW COUNTY, OREGON

PROPOSED SPECIES

None

No Proposed Endangered Species	PE
No Proposed Threatened Species	PT

CANDIDATE SPECIES

Mammals

Terrestrial:

Washington ground squirrel	*Urocitellus washingtoni*

SPECIES OF CONCERN

Mammals

Silver-haired bat	*Lasionycteris noctivagans*
Small-footed myotis bat	*Myotis ciliolabrum*
Long-eared myotis bat	*Myotis evotis*
Yuma myotis bat	*Myotis yumanensis*

Birds

Northern goshawk	*Accipiter gentilis*
Western burrowing owl	*Athene cunicularia hypugaea*
Ferruginous hawk	*Buteo regalis*
Olive-sided flycatcher	*Contopus cooperi*
Willow flycatcher	*Empidonax traillii adastus*
Yellow-breasted chat	*Icteria virens*
Lewis' woodpecker	*Melanerpes lewis*
Mountain quail	*Oreortyx pictus*
White-headed woodpecker	*Picoides albolarvatus*

Reptiles and Amphibians

Northern sagebrush lizard	*Sceloporus graciosus graciosus*

Fish

Margined sculpin	*Cottus marginatus*
Pacific lamprey	*Lampetra tridentata*

Plants

Robinson's onion	*Allium robinsonii*
Laurence's milk-vetch	*Astragalus collinus var. laurentii*

DELISTED SPECIES

Birds

FEDERALLY LISTED, PROPOSED, CANDIDATE SPECIES
AND SPECIES OF CONCERN
UNDER THE JURISDICTION OF THE FISH AND WILDLIFE SERVICE
WHICH MAY OCCUR WITHIN MORROW COUNTY, OREGON

American Peregrine falcon	*Falco peregrinus anatum*
Bald eagle	*Haliaeetus leucocephalus*

Definitions:

Listed Species: An endangered species is one that is in danger of extinction throughout all or a significant portion of its range. A threatened species is one that is likely to become endangered in the foreseeable future.

Proposed Species: Taxa for which the Fish and Wildlife Service or National Marine Fisheries Service has published a proposal to list as endangered or threatened in the Federal Register.

Candidate Species: Taxa for which the Fish and Wildlife Service has sufficient biological information to support a proposal to list as endangered or threatened.

Species of Concern: Taxa whose conservation status is of concern to the U.S. Fish and Wildlife Service (many previously known as Category 2 candidates), but for which further information is still needed. Such species receive no legal protection and use of the term does not necessarily imply that a species will eventually be proposed for listing.

Delisted Species: A species that has been removed from the Federal list of endangered and threatened wildlife and plants.

Key:

E	Endangered
T	Threatened
CH	Critical Habitat has been designated for this species
PE	Proposed Endangered
PT	Proposed Threatened
PCH	Critical Habitat has been proposed for this species

Notes:

Marine & Anadromous Species: Please consult the National Marine Fisheries Service (NMFS) (http://www.nmfs.noaa.gov/pr/species/) for marine and anadromous species. The National Marine Fisheries Service (NMFS) manages mostly marine and anadromous species, while the U.S. Fish and Wildlife Service manages the remainder of the listed species, mostly terrestrial and freshwater species.

Marine Turtle Conservation and Management: All six species of sea turtles occurring in the U.S. are protected under the Endangered Species Act of 1973. In 1977, NOAA Fisheries and the U.S. Fish and Wildlife Service signed a Memorandum of Understanding to jointly administer the Endangered Species Act with respect to marine turtles. NOAA Fisheries has the lead responsibility for the conservation and recovery of sea turtles in the marine environment and the U.S. Fish and Wildlife Service has the lead for the conservation and recovery of sea turtles on nesting beaches. For more information, see the NOAA Fisheries webpage on sea turtles http://www.nmfs.noaa.gov/pr/species/turtles/.

Gray Wolf: In 2008, the Service published a final rule that established a distinct population segment of the gray wolf (*Canis lupis*) in the northern Rocky Mountains (which includes a portion of Eastern Oregon, east of the centerline of Highway 395 and Highway 78 north of Burns Junction and that portion of Oregon east of the centerline of Highway 95 south of Burns Junction). Any wolves found west of this line in Oregon belong to the

conterminous USA population [see 73 FR 10514]. On May 5, 2011, the Fish and Wildlife Service published a final rule – as directed by legislative language in the Fiscal Year 2011 appropriations bill – reinstating the Service's 2009 decision to delist biologically recovered gray wolf populations in the Northern Rocky Mountains. Gray wolves in Oregon are State-listed as endangered, regardless of location.

Appendix B2. United State Fish and Wildlife Service Umatilla County species list (USFWS, 2012c).

FEDERALLY LISTED, PROPOSED, CANDIDATE SPECIES
AND SPECIES OF CONCERN
UNDER THE JURISDICTION OF THE FISH AND WILDLIFE SERVICE
WHICH MAY OCCUR WITHIN UMATILLA COUNTY, OREGON

LISTED SPECIES

Fish

Inland:

Bull trout	*Salvelinus confluentus*	CH T

PROPOSED SPECIES

None

No Proposed Endangered Species	PE
No Proposed Threatened Species	PT

CANDIDATE SPECIES

Mammals

Terrestrial:

Washington ground squirrel	*Urocitellus washingtoni*
North American wolverine	*Gulo gulo luscus*

SPECIES OF CONCERN

Mammals

Pallid bat	*Antrozous pallidus pacificus*
Townsend's western big-eared bat	*Corynorhinus townsendii townsendii*
Silver-haired bat	*Lasionycteris noctivagans*
Small-footed myotis bat	*Myotis ciliolabrum*
Long-eared myotis bat	*Myotis evotis*
Long-legged myotis bat	*Myotis volans*
Yuma myotis bat	*Myotis yumanensis*
Preble's shrew	*Sorex preblei*

Birds

Northern goshawk	*Accipiter gentilis*
Tricolored blackbird	*Agelaius tricolor*
Western burrowing owl	*Athene cunicularia hypugaea*
Upland sandpiper	*Bartramia longicauda*
Ferruginous hawk	*Buteo regalis*
Olive-sided flycatcher	*Contopus cooperi*
Willow flycatcher	*Empidonax traillii adastus*
Yellow-breasted chat	*Icteria virens*
Lewis' woodpecker	*Melanerpes lewis*
Mountain quail	*Oreortyx pictus*
White-headed woodpecker	*Picoides albolarvatus*

Reptiles and Amphibians

Northern sagebrush lizard	*Sceloporus graciosus graciosus*

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FEDERALLY LISTED, PROPOSED, CANDIDATE SPECIES
AND SPECIES OF CONCERN
UNDER THE JURISDICTION OF THE FISH AND WILDLIFE SERVICE
WHICH MAY OCCUR WITHIN UMATILLA COUNTY, OREGON

Fish

Margined sculpin	*Cottus marginatus*
Pacific lamprey	*Lampetra tridentata*

Plants

Robinson's onion	*Allium robinsonii*
Laurence's milk-vetch	*Astragalus collinus var. laurentii*
Dwarf evening-primrose	*Camissonia pygmaea*
Sessile mousetail	*Myosurus sessilis*
Douglas' clover	*Trifolium douglasii*

DELISTED SPECIES

Birds

American Peregrine falcon	*Falco peregrinus anatum*
Bald eagle	*Haliaeetus leucocephalus*

Definitions:

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Key:

E	Endangered
T	Threatened
CH	Critical Habitat has been designated for this species
PE	Proposed Endangered
PT	Proposed Threatened
PCH	Critical Habitat has been proposed for this species

Notes:

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U.S. Fish and Wildlife Service, Oregon Fish and Wildlife Office
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FEDERALLY LISTED, PROPOSED, CANDIDATE SPECIES AND SPECIES OF CONCERN UNDER THE JURISDICTION OF THE FISH AND WILDLIFE SERVICE WHICH MAY OCCUR WITHIN UMATILLA COUNTY, OREGON

Marine & Anadromous Species: Please consult the National Marine Fisheries Service (NMFS) (http://www.nmfs.noaa.gov/pr/species/) for marine and anadromous species. The National Marine Fisheries Service (NMFS) manages mostly marine and anadromous species, while the U.S. Fish and Wildlife Service manages the remainder of the listed species, mostly terrestrial and freshwater species.

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Gray Wolf: In 2008, the Service published a final rule that established a distinct population segment of the gray wolf (*Canis lupis*) in the northern Rocky Mountains (which includes a portion of Eastern Oregon, east of the centerline of Highway 395 and Highway 78 north of Burns Junction and that portion of Oregon east of the centerline of Highway 95 south of Burns Junction). Any wolves found west of this line in Oregon belong to the conterminous USA population [see 73 FR 10514]. On May 5, 2011, the Fish and Wildlife Service published a final rule – as directed by legislative language in the Fiscal Year 2011 appropriations bill – reinstating the Service's 2009 decision to delist biologically recovered gray wolf populations in the Northern Rocky Mountains. Gray wolves in Oregon are State-listed as endangered, regardless of location.

Appendix C. Special status vertebrate wildlife species of documented or potential occurrence in the Wheatridge Wind Energy Facility area (bats addressed in Appendix D).

Common Name and Scientific Name	Federal Status	ODFW Status	Occurrence in or within Five Miles of Wheatridge Project Boundary D=Documented N=Not Documented
Mammals			
White-tailed jackrabbit *Lepus townsendii*	–	SV	**D**– One ORBIC record within five miles of the Project. Documented on Project during special status wildlife species surveys. Prefers open, bunchgrass steppe and frequents revegetated grasslands like those in the Conservation Reserve Program (CRP).
Washington ground squirrel *Urocitellus washingtoni*	C Priority List 2	E	**D**– ORBIC WGS records (28) within the five-mile database search area. Documented within Project area during special status wildlife species surveys.
Birds			
Northern goshawk *Accipiter gentilis*	SoC	SV	**N**–Hunts in open woodlands and forest edges. Prefers to nest in dense mature forests. Suitable winter foraging habitat but no nesting habitat exists within Project boundary. This species has low potential to occur within Project boundary.
Swainson's hawk *Buteo swainsoni*	–	SV	**D**– Documented nesting within five miles of Project by ORBIC (two records). Documented on Project during avian use surveys, raptor nest survey, and special status wildlife species survey. Nests in open grassland steppe areas and agricultural settings. Prefers isolated scattered trees for nesting, but also known to nest in shrubs or on small rock outcrops.
Ferruginous hawk *Buteo regalis*	SoC BoCC	SC	**D**–Records of nesting (two) documented in ORBIC database within five miles of Project. Documented on Project during avian use surveys, raptor nest survey, and special status wildlife species surveys.
Golden eagle *Aquila chrysaetos*	EPA BoCC	–	**D**–Documented on Project during avian use surveys and eagle nest surveys. Needs large rocky cliffs or large trees for nesting.
Bald eagle *Haliaeetus leucocephalus*	NW EPA BoCC	–	**D**– One historical record of nesting within five miles in ORBIC records (that nest no longer present). Documented during avian use surveys in winter months. Known to hunt uplands for carrion and small mammals.
Peregrine falcon *Falco peregrinus*	**NW** BoCC	SV	**D**–Documented on Project during avian use surveys. Nests in basalt cliffs along Columbia River.
Mountain quail *Oreortyx pictus*	SoC	–	**N**–Utilizes shrubby ravines, draws, and ditches, forest edges, and slopes. Descends to lower elevations in the winter. Suitable habitat exists within five miles of Project boundary. Little or no suitable habitat within Project boundary.
Greater Sandhill crane *Grus canadensis tabida*	–	SV	**D**– Documented during avian use surveys. Occurs during seasonal migrations, when it usually flies much higher than rotor swept area.
Long-billed curlew *Numenius americanus*	BoCC	SV	**D**– ORBIC records (two) within five miles of Project, including one nesting location. Documented on Project in spring and summer during avian use surveys and special status wildlife species surveys. Nests in grassland flats and plateaus. Considered "Highly Imperiled" (U.S. and Canadian shorebird conservation plans) due to declines throughout its geographic range.

Common Name and Scientific Name	Federal Status	ODFW Status	Occurrence in or within Five Miles of Wheatridge Project Boundary D=Documented N=Not Documented
Western burrowing owl *Athene cunicularia hypugaea*	SoC	SC	**D**– Documented breeding in ORBIC database (one record). Documented breeding on Project during special status wildlife surveys. In shrub-steppe and grassland areas, uses existing burrows of coyotes, badgers, and small mammals for nesting.
Lewis' woodpecker *Melanerpes lewis*	SoC BoCC	SC	**N**–Utilizes riparian corridors, Douglas-fir, ponderosa pine, and oak habitats. May be suitable habitat in forest habitat to the south of Project. Likely passes through Project area infrequently during dispersal.
White-headed Woodpecker *Picoides albolarvatus*	SoC	–	**N**–Utilizes open coniferous forests in mountains; prefers ponderosa pine. No suitable habitat expected within five miles of Project; migrates to lower elevations in winter. Very low likelihood of occurrence on Project.
Olive-sided Flycatcher *Contopus cooperii*	SoC	SV	**N**–Utilizes montane coniferous forests, clearing edges, and wooded borders of bogs. Very low potential for occurrence within Project boundary.
Willow flycatcher *Empidonax trailii adastus*	SoC BoCC	SV	**N**–Prefers willow and other riparian shrub thickets along streams and brushy uplands. Suitable riparian habitat exists within five miles of Project boundary. This species has potential to occur within Project boundary.
Loggerhead shrike *Lanius ludovicianus*	BoCC	SV	**D**–Documented on Project during avian use surveys and special status wildlife species surveys. Suitable nesting habitat—sagebrush and junipers—is limited within the Project boundary.
Yellow-breasted chat *Icteria virens*	SoC	–	**N**–Utilizes dense undergrowth thickets, forest edges, low wet areas and stream and pond edges. Small amounts of suitable riparian habitat exist on and within five miles of Project boundary.
Sagebrush sparrow *Artemisiospiza nevadensis*	BoCC	SC	**N**–May occur during migration. Sagebrush habitat on Project is limited, likely not extensive enough to support breeding. Observed rarely in nearby portions of the Columbia Plateau.
Grasshopper sparrow *Ammodramus savannarum*	–	SV	**D**–Documented by ORBIC within five miles (one record). Documented in a variety of grassland habitats on Project during avian use surveys and special status wildlife species surveys.
Tricolored blackbird *Agelaius tricolor*	SoC	–	**N**–Breeds in marshy areas and pond edges, but may forage and disperse into grassland and shrub-steppe habitats. This species has potential to occur within Project boundary.
Amphibians, Reptiles, and Turtles			
Northern sagebrush lizard *Sceloparus graciosus graciosus*	SoC	SV	**N**–Prefers shrub-steppe habitats and open forests of juniper, ponderosa and lodgepole pine that have open, brushy understories. This species has potential to occur within Project boundary.
Western painted turtle *Chrysemys picta*	–	SC	**D**–Documented by ORBIC within five miles (one record). No suitable habitat within Project boundary.
Fish			
Margined sculpin *Cottus marginatus*	SoC	–	**D**–One ORBIC record for this species within five miles of Wheatridge East. This species may have potential to occur within Project boundary.
Steelhead (middle Columbia River ESU, summer run) *Oncorhynchus mykiss*	T	SC	**D**–Two ORBIC records within five miles of Wheatridge East boundary. This species has no potential for occurrence within the Project boundary.

Common Name and Scientific Name	Federal Status	ODFW Status	Occurrence in or within Five Miles of Wheatridge Project Boundary D=Documented N=Not Documented
Inland Columbia Basin redband trout *Oncorhynchus mykiss gairdneri*	–	SC	**D**–Not documented within Project boundary. One ORBIC record within five miles of Wheatridge East Project boundary. This species may have potential to occur within Project boundary.
Bull trout *Salvelinus confluentus*	T	SC	**D**–Documented within five miles of Wheatridge East by ORBIC. There is no potential for occurrence of this species within Project boundary.
Pacific lamprey *Lampetra tridentata*	SoC	SV	**N**–Not documented within Project boundary or within five miles of Project boundary. The potential for occurrence of this species within Project boundary is unknown.

Status Key
Federal:

T	Threatened	SoC	Species of Concern
E	Endangered	NW	Not Warranted**;** delisted
C	Candidate	EPA	Bald and Golden Eagle Protection Act
BoCC	USFWS Birds of Conservation Concern (BCR 9, Great Basin)		
–	No special status		

Note: All native migratory birds are protected by the federal Migratory Bird Treaty Act (MBTA).

Oregon (ORBIC, 2010):

T	Threatened
E	Endangered
SC	"Critical" sensitive species are those for which listing as Threatened or Endangered would be appropriate if immediate conservation actions were not taken. Some peripheral species which are at risk throughout their range and some disjunct populations (those that are geographically isolated from other populations) area also considered "Critical."
SV	"Vulnerable" sensitive species are not in imminent danger of being listed as Threatened or Endangered, but could become Sensitive-critical, Threatened, or Endangered with changes in populations, habitats or threats.

Sources for status = CBMRCD/NWPPC, 2004; ODFW, 2008; ORBIC, 2010; USFWS, 2008b; USFWS, 2012b and 2012c

Appendix D. Species of bats found in eastern Oregon and their occurrence or potential for occurrence in the Wheatridge Wind Energy Facility area.

Common Name and Scientific Name	Federal Status[1]	State of Oregon Status[2]	Documented during 2011 at Wheatridge?	Documented in Morrow County?[3]	Adjacent OR Counties Where Documented[3]	Primary Roost Sites[4]	Foraging Habitat[4]	Likelihood of Occurrence in Project Area[5]	Comments
Pallid bat *Antrozous pallidis*	SoC	SV	No	No	Gilliam (OR), Wheeler (OR), Umatilla (OR)	Rock crevices, tree hollows, mines, caves, buildings	Rocky deserts, grasslands; takes large insects, often from the ground	Low	Occurs along Rock Creek in Gilliam Co. (Gerhardt et al., 2011; Kronner and Gritski, personal field notes).
Townsend's big-eared bat *Corynorhinus townsendii*	SoC	SC	No	No	Gilliam (OR), Wheeler (OR), Umatilla (OR)	Mines, caves, buildings	Edges along streams, areas adjacent to and within pinyon-juniper and pine forests, desert scrub, agricultural areas; probably a moth specialist	Low	Appropriate roost sites are mostly lacking with the exception of farm buildings, suitability unknown. Occurs along Rock Creek in Gilliam Co. (Kronner and Gritski, personal field notes). Closest known breeding population in Klickitat Co., WA.
Big brown bat *Eptesicus fuscus*	None	None	No	Yes	Gilliam (OR), Wheeler (OR)	Rock crevices, tree hollows, mines, caves, buildings	Wide variety including desert scrub, grasslands, forests, urban areas; perhaps a beetle specialist	Low	Found at several CPE wind projects as a fatality. Occurs along Rock Creek in Gilliam Co. (Gerhardt et al., 2011; Kronner and Gritski, personal field notes).
Spotted bat *Euderma maculatum*	SoC	SV	No	No	Gilliam (OR), Wheeler (OR)	Rock crevices in cliff faces	Riparian areas, meadows, old agricultural fields, forest openings	Low	Has patchy distribution; individuals travel widely; echolocation signal audible to humans. Nearest record is from John Day River at Cottonwood Creek (Rodhouse et al., 2005). One found at Lake Billy Chinook in Jefferson Co. (Concannon and Fitzhenry, Pers. Comm., 2012).
Hoary bat *Lasiurus cinereus*	None	SV	Yes	Yes	Gilliam (OR), Wheeler (OR), Umatilla (OR)	Foliage of trees	Riparian areas, grasslands, shrub-steppe, forest edges and openings, urban areas	Low in summer; high in fall during migration	Found at most CPE wind projects as a fatality.

Common Name and Scientific Name	Federal Status[1]	State of Oregon Status[2]	Documented during 2011 at Wheatridge?	Documented in Morrow County?[3]	Adjacent OR Counties Where Documented[3]	Primary Roost Sites[4]	Foraging Habitat[4]	Likelihood of Occurrence in Project Area[5]	Comments
Silver-haired bat *Lasionycteris noctivagans*	SoC	SV	Yes	Yes	Gilliam (OR), Wheeler (OR) Umatilla (OR)	Tree cavities, under loose bark	Forested areas, riparian areas near forest	Low in summer; high in fall during migration	Found at most CPE wind projects as a fatality.
California myotis *Myotis californicus*	None	SV	Yes	No	Gilliam (OR), Wheeler (OR)	Rock crevices, under loose bark, tree cavities, buildings	Shrub-steppe, desert, arid grasslands, coniferous forest edges	High	Habitat probably available for both foraging and roosting.
Western small-footed myotis *Myotis ciliolabrum*	SoC	None	Yes	Yes	Gilliam (OR), Sherman (OR), Umatilla (OR), Wheeler (OR)	Rock crevices, caves, mines, talus slopes, buildings	Desert, semiarid shrubland, riparian areas, coniferous forest	High	Occurs along Willow Creek, Morrow Co. (Kronner and Gritski, personal field notes) and Rock Creek, Gilliam Co. (Gerhardt et al., 2011).
Long-eared myotis *Myotis evotis*	SoC	None	No	Yes	Gilliam (OR), Umatilla (OR), Wheeler (OR)	Rock crevices, tree cavities, under loose bark, tree stumps, caves, mines, buildings	Coniferous forest, semiarid shrubland, sage; often gleans insects from plant and rock surfaces	Low	More common in forests than arid scrubland. Occurs along Rock Creek in Gilliam Co. (Kronner and Gritski, personal field notes).
Little brown bat *Myotis lucifugus*	None	None	Yes	Yes	Gilliam (OR), Wheeler (OR)	Tree cavities, under loose bark, rock crevices, caves, buildings	Open forest, forest edges, over water in arid habitats	High	Common at Wheatridge; found at several CPE wind projects as a fatality.

Common Name and Scientific Name	Federal Status[1]	State of Oregon Status[2]	Documented during 2011 at Wheatridge?	Documented in Morrow County?[3]	Adjacent OR Counties Where Documented[3]	Primary Roost Sites[4]	Foraging Habitat[4]	Likelihood of Occurrence in Project Area[5]	Comments
Fringed myotis *Myotis thysanodes*	SoC	SV	No	No	Gilliam (OR)	Caves, mines, rock crevices, tree cavities, buildings	Dry woodlands, desert scrubland, grasslands, coniferous forest	Low	Most common roosts are in caves, mines, and snags. Occurs along Rock Creek in Gilliam Co. (Kronner and Gritski, personal field notes).
Long-legged myotis *Myotis volans*	SoC	SV	No	Yes	Gilliam (OR), Wheeler (OR), Umatilla (OR)	Tree cavities, under loose bark, rock crevices, buildings	Montane coniferous forest, desert, riparian areas	Low	Inhabits montane forests, but can be found in desert and riparian habitats. Uses buildings, hollow trees, and crevices in rock outcrops for maternity roost; hibernates in caves and mines.
Yuma myotis *Myotis yumanensis*	SoC	None	No	Yes	Gilliam (OR), Sherman (OR), Wheeler (OR), Umatilla (OR)	Caves, mines, rock crevices, buildings	Near or over water in desert, scrubland, and forest	Low	Might roost in rock crevices or old abandoned buildings. Occurs along Rock Creek in Gilliam Co. (Gerhardt et al., 2011; Kronner and Gritski, personal field notes).
Canyon bat *Parastrellus hesperus*	None	None	Yes	No	Gilliam (OR), Sherman (OR), Wheeler (OR)	Rock crevices, caves, mines	Desert, rocky canyons, shrub-steppe	High	Common; recorded at all locations and during all months of survey.

[1]SoC = Federal Species of Concern (USFWS, 2012b, 2012c).

[2]Current status according to Oregon Department of Fish and Wildlife; SC = Sensitive Critical, SV = Sensitive Vulnerable (ODFW, 2008; ORBIC, 2010).

[3]Sources of information: Oregon Biodiversity Database (ORBIC 2010), U.S. Fish and Wildlife lists (USFWS, 2012b, 2012c), Verts and Carraway (1998); Gerhardt et al. (2011); personal communication from Mark Perkins, Bats-R-Us Northwest, Portland, OR (Perkins, 1994a, 1994b, 1995); personal knowledge and inventories conducted by Karen Kronner and Bob Gritski, Northwest Wildlife Consultants, Inc.; Condon, Oregon Wind Project BPA EIS, and personal knowledge of Dr. Burr Betts, LaGrande, OR (under contract to Northwest Wildlife Consultants, Inc.; Betts, 1998, 2004), Kronner and Betts, 2004

[4]Based on Fleckenstein (2001).

[5]Based on: Nagorsen and Brigham (1993), Verts and Carraway (1998), Western States Bat Working Group (1998), various Mammalian Species accounts, and NWC staff knowledge. Does not include information obtained during Project-specific species inventory studies.

Appendix E. Rare vascular and non-vascular plant species with potential for occurrence within the Wheatridge Wind Energy Facility area.

Name	Status	Typical Habitat	Likelihood* of Occurrence	Identification Period
Bryoerythrophyllium columbianum **Columbian carpet moss**	OR Rank: G4G4S2 ORBIC List: 2	Soil on largely acid rock, sandy soil, grassland steppe or ledges and bluffs near rivers, often forming or part of crusts; moderate elevations	Moderate	Can be identified throughout the year
Astragalus collinus var. laurentii **Laurent's milkvetch**	USFWS: SC ODA: LT OR Rank: G5T1S1 ORBIC List: 1	Basaltic grassland and sagebrush desert.	Moderate to High	May–June
Astragalus sclerocarpus **Woodypod milkvetch**	OR Rank: G5SNR ORBIC List: 3	Open xeric locations with sandy soils	Moderate	April–June
Astragalus succumbens **Columbia milkvetch**	OR Rank: G4G5S4 ORBIC List: 4	Sandy places and rocky sagebrush desert, from the Columbia River to the lower foothills. Elevation: 300-700 ft.	Low	April–June
Camissonia pygmaea **Dwarf suncup**	USFWS: SC ODA: C OR Rank: G3S1 ORBIC List: 1	Rocky slopes, sandy banks, and dry gravelly washes	Low	Late April–June
Cyperus bipartitus **Slender flatsedge**	OR Rank: G5SNR ORBIC List: 3	Streambanks and other wet, low places	Moderate	May–July
Cryptantha leucophaea **Gray cryptantha**	OR Rank: G2G3H ORBIC List:2-EX	Sandy dunes and open xeric sandy areas.	Low	May–June
Carex retrorsa **Knotsheath sedge**	OR Rank: G5S1 ORBIC List: 2	Swamps, bogs, wet thickets, often along streams, marshes, sedge meadows, ponds and lake shores, in the foothills and lowlands.	Low	May–Sept
Hackelia diffusa var. cottonii **Cotton's stickseed**	OR Rank: G4T4S3 ORBIC List: 4	On steep talus slopes or on cliffs. Elevation: 100-3000 ft.	Low	May–June
Heliotropium curassavicum **Salt heliotrope**	OR Rank:G5S2 ORBIC List: 2	Saline places at low elevations; dried ponds	Moderate	June–Sept
Lesquerella douglasii **Douglas' bladderpod**	OR Rank: G4?SNR ORBIC List: 3	Open xeric locations – usually well-drained sandy/rocky soils Elevation: 200-800 ft.	Low	April–May
Lomatium watsonii **Watson's desertparsley**	OR Rank: G4S1 ORBIC List: 2	Open, rocky hillsides often within sagebrush.	Low	May
Lygodesmia juncea **Rush skeletonplant**	OR Rank: G5SNR ORBIC List: 3	Open xeric locations – sandy/rocky soils	Low	May–Sept
Mimulus evanescens **Disappearing monkeyflower**	USFWS: SC ODA: C OR Rank: G2S2 ORBIC List: 1	Moist, heavy gravel which has been inundated earlier in the spring	Low	Late April–Mid May
Mimulus jungermannioides **Liverwort monkeyflower**	ODA: C OR Rank:G3S3 ORBIC List: 4	Basalt crevices in seepage zones in vertical cliff faces and canyon walls. Elevation: 500-3300 ft.	Low - Mod	May–Late August

Name	Status	Typical Habitat	Likelihood* of Occurrence	Identification Period
Myosurus sessilis **Vernal pool mousetail**	USFWS: SC ODA: C OR Rank:G2S1 ORBIC List: 1	Moist areas and drying vernal pools and alkali flats. Elevation: 50-5200 ft.	High	May–July
Texosporium sancti-jacobi **St. Jacob texosporium lichen**	USFWS: SC OR Rank: G3S1 ORBIC List: 2	Deep soil, high ecological quality habitats on gentle aspects	Low	Can be identified throughout the year

* Potential for occurrence prior to the site-specific field surveys

USFWS (US Fish and Wildlife Service) Ranking Key:
LE = Listed Endangered. Taxa in danger of extinction throughout all or a significant portion of their range.
LT = Listed Threatened. Taxa likely to be classified as Endangered within the foreseeable future throughout all or a significant portion of their range.
PE = Proposed Endangered. Taxa proposed to be listed as Endangered (formal rulemaking in progress).
PT = Proposed Threatened. Taxa proposed to be listed as Threatened (formal rulemaking in progress).
C = Candidate Species. Taxa for which sufficient threats exist to warrant a proposal to list the species/subtaxon as Threatened or Endangered
SC = Species of Concern. Available information supports tracking the status and threats to species/subtaxon.

ODA (Oregon Department of Agriculture) Ranking Key:
LE = Listed Endangered.
LT = Listed Threatened.
C = Candidate for listing as Threatened or Endangered.

OR Rank (Oregon Natural Heritage Program) Categories Key:
G = Global rank indicator; denotes rank based on range wide status.
T = Trinomial rank indicator; denotes range wide status of intraspecific taxa.
S = State rank indicator; denotes rank based on status within Oregon.
1 = Critically imperiled because of extreme rarity or because some factor of its biology makes it especially vulnerable to extinction (typically 5 or fewer occurrences).
2 = Imperiled because of rarity or because other factors demonstrably make it very vulnerable to extinction (typically 6 to 20 occurrences).
3 = Rare or uncommon but not imperiled (typically 21 to100 occurrences).
4 = Not rare and apparently secure, but with cause for long-term concern (usually more than 100 occurrences).
5 = Demonstrably widespread, abundant, and secure.
E = Exotic or introduced.
U = Unknown.
H = Historical occurrence (i.e., formerly part of the native biota with the implied expectation that it might be rediscovered).
X = Presumed extinct or extirpated.
Q = Indicates uncertainty about taxonomic status.
? = Not yet ranked.

ORBIC (Oregon Biodiversity Information Center) Rare Plant Lists Key:
1 = List 1 taxa are Endangered or Threatened throughout their range or are presumed extinct.
2 = List 2 taxa are Threatened, Endangered, or possibly extirpated from Oregon, but are more stable elsewhere.
3 = List 3 contains taxa for which more information is needed before status can be determined, but which may be Threatened or Endangered in Oregon or throughout their range.
4 = List 4 contains taxa of concern which are not currently Threatened or Endangered
EX = Thought to be extirpated from Oregon

Appendix F. Comprehensive plant species list for the Wheatridge Wind Energy Facility, 2011 (listed alphabetically by family, then by scientific name).

Ab	Accepted Scientific Name	Common Name	Family	Nativity	Hitchcock & Cronquist Synonym	Notes
2	*Lomatium grayi*	Gray's biscuitroot	*Apiaceae*	N		
2	*Lomatium macrocarpum*	bigseed biscuitroot	*Apiaceae*	N		
3	*Lomatium nudicaule*	barestem biscuitroot	*Apiaceae*	N		
3	*Lomatium simplex var. simplex*	Great Basin desertparsley	*Apiaceae*	N	*Lomatium triternatum ssp. Platycarpum*	
2	*Achillea millefolium*	common yarrow	*Asteraceae*	N		
2	*Agoseris heterophylla*	annual agoseris	*Asteraceae*	N		
5	*Antennaria dimorpha*	low pussytoes	*Asteraceae*	N		
5	*Artemisia tridentata ssp. tridentata*	basin big sagebrush	*Asteraceae*	N		
2	*Balsamorhiza careyana*	Carey's balsamroot	*Asteraceae*	N		
5	*Balsamorhiza serrate*	serrate balsamroot	*Asteraceae*	N		
2	*Blepharipappus scaber*	rough eyelashweed	*Asteraceae*	N		
4	*Centaurea diffusa*	diffuse knapweed	*Asteraceae*	I		OR "B" noxious weed
3	*Centromadia pungens ssp. pungens*	common tarweed	*Asteraceae*	I		
2	*Chaenactis douglasii*	Douglas's dustymaiden	*Asteraceae*	N		
2	*Chrysothamnus viscidiflorus*	yellow rabbitbrush	*Asteraceae*	N		
3	*Cirsium arvense*	Canada thistle	*Asteraceae*	I		OR "B" noxious weed
3	*Cirsium vulgare*	bull thistle	*Asteraceae*	I		OR "B" noxious weed
2	*Conyza Canadensis*	Canadian horseweed	*Asteraceae*	I		
5	*Crepis atribarba*	slender hawksbeard	*Asteraceae*	N		
2	*Crocidium multicaule*	common spring-gold	*Asteraceae*	N		
2	*Ericameria nauseosa*	rubber rabbitbrush	*Asteraceae*	N	*Chrysothamnus nauseosus*	
2	*Erigeron linearis*	desert yellow fleabane	*Asteraceae*	N		
5	*Erigeron filifolius*	threadleaf fleabane	*Asteraceae*	N		
5	*Erigeron poliospermus*	purple cushion fleabane	*Asteraceae*	N		
5	*Erigeron pumilus*	shaggy fleabane	*Asteraceae*	N		
7	*Gaillardia aristata*	blanketflower	*Asteraceae*	N		
1	*Gutierrezia sarothrae*	broom snakeweed	*Asteraceae*	N		
2	*Lactuca serriola*	prickly lettuce	*Asteraceae*	I		Invasive
3	*Lagophylla ramosissima*	branched lagophylla	*Asteraceae*	N		
5	*Matricaria discoidea*	disc mayweed	*Asteraceae*	I	*Matricaria matricarioides*	Disturbed areas
3	*Nothocalais troximoides*	sagebrush false dandelion	*Asteraceae*	N	*Microseris troximoides*	
2	*Taraxacum officinale*	common dandelion	*Asteraceae*	I		

Ab	Accepted Scientific Name	Common Name	Family	Nativity	Hitchcock & Cronquist Synonym	Notes
2	*Tragopogon dubius*	yellow salsify	*Asteraceae*	I		
1	*Amsinckia lycopsoides*	tarweed fiddleneck	*Boraginaceae*	N		
1	*Amsinckia menziesii*	Menzie's fiddleneck	*Boraginaceae*	N	*Amsinckia retrorsa*	
3	*Buglossoides arvensis*	corn gromwell	*Boraginaceae*	I	*Lithospermum arvense*	
6	*Lithospermum ruderale*	western stoneseed	*Boraginaceae*	N		
2	*Plagiobothrys tenellus*	Pacific popcornflower	*Boraginaceae*	N		
1	*Chorispora tenella*	crossflower	*Brassicaceae*	I		Invasive
2	*Descurainia pinnata*	western tansymustard	*Brassicaceae*	N		
2	*Descurainia Sophia*	herb sophia	*Brassicaceae*	I		Disturbed localities around homesteads
1	*Draba verna*	spring draba	*Brassicaceae*	I		
6	*Erysimum asperum*	western wallflower	*Brassicaceae*	N		
2	*Idahoa scapigera*	oldstem idahoa	*Brassicaceae*	N		
1	*Lepidium perfoliatum*	clasping pepperweed	*Brassicaceae*	I		
1	*Sisymbrium altissimum*	tall tumblemustard	*Brassicaceae*	I		Invasive
2	*Thysanocarpus curvipes*	sand fringepod	*Brassicaceae*	N		
2	*Holosteum umbellatum*	jagged chickweed	*Caryophyllaceae*	I		
2	*Chenopodium album*	lambsquarters	*Chenopodiaceae*	I		
1	*Salsola kali*	Russian thistle	*Chenopodiaceae*	I		
2	*Convolvulus arvensis*	field bindweed	*Convolvulaceae*	I		OR “B” noxious weed
7	*Juniperus occidentalis*	western juniper	*Cupressaceae*	N		
7	*Dipsacus sylvestris*	teasel	*Dipsaceae*	I		
5	*Astragalus arthuri*	waha milkvetch	*Fabaceae*	N		
6	*Astragalus collinus var. laurentii*	Laurent’s milkvetch	*Fabaceae*	N		OR Threatened/USFWS SOC
5	*Astragalus filipes*	basalt milkvetch	*Fabaceae*	N		
2	*Astragalus lentiginosus var. lentiginosus*	freckled milkvetch	*Fabaceae*	N		
2	*Astragalus purshii*	woollypod milkvetch	*Fabaceae*	N		
7	*Astragalus sclerocarpus*	woodlypod milkvetch	*Fabaceae*	N		ORBIC list 3
6	*Astragalus succumbens*	Columbia milkvetch	*Fabaceae*	N		ORBIC list 4
2	*Lupinus leucophyllus*	velvet lupine	*Fabaceae*	N		
5	*Lupinus sulphureus*	sulphur lupine	*Fabaceae*	N		
5	*Medicago sativa*	alfalfa	*Fabaceae*	I		Mostly in revegetated fields
1	*Erodium cicutarium*	redstem stork’s bill	*Geraniaceae*	I		
2	*Phacelia hastate*	silverleaf phacelia	*Hydrophyllaceae*	N		
6	*Phacelia linearis*	threadleaf phacelia	*Hydrophyllaceae*	N		
4	*Salvia dorrii*	purple sage	*Lamiaceae*	N		
6	*Allium acuminatum*	tapertip onion	*Lilaceae*	N		

Ab	Accepted Scientific Name	Common Name	Family	Nativity	Hitchcock & Cronquist Synonym	Notes
5	*Calochortus macrocarpus*	sagebrush mariposa lily	*Lilaceae*	N		
5	*Fritillaria pudica*	yellow fritillary	*Lilaceae*	N		
5	*Triteleia grandiflora var. howellii*	Howell's triteleia	*Lilaceae*	N	*Brodiaea howellii*	
6	*Zigandenus paniculatus*	foothill deathcamas	*Lilaceae*	N		
5	*Linum perenne*	blue flax	*Linaceae*	N		
3	*Malva neglecta*	common mallow	*Malvaceae*	I		
5	*Sphaeralcea grossulariifolia*	gooseberryleaf globemallow	*Malvaceae*	N		
3	*Epilobium sp.*	willowherb	*Onagraceae*	N		
1	*Plantago patagonica*	woolly plantain	*Plantaginaceae*	N		
4	*Agropyron cristatum*	crested wheatgrass	*Poaceae*	I		Planted on revegetated sites
2	*Bromus arvensis*	field brome	*Poaceae*	I	*Bromus japonicus*	Invasive
6	*Bromus carinatus*	California brome	*Poaceae*	N		
1	*Bromus tectorum*	cheatgrass	*Poaceae*	I		Invasive
5	*Elymus elymoides*	squirreltail	*Poaceae*	N	*Sitanion hystrix*	
5	*Festuca idahoensis*	Idaho fescue	*Poaceae*	N		
5	*Hesperostipa comate*	needle and thread	*Poaceae*	N	*Stipa comate*	
5	*Leymus cinereus*	basin wildrye	*Poaceae*	N	*Elymus cinereus*	
1	*Poa bulbosa*	bulbous bluegrass	*Poaceae*	I		
2	*Poa secunda*	Sandberg bluegrass	*Poaceae*	N	*Poa sandbergii*	
4	*Poa secunda (ampla)*	Sandberg bluegrass	*Poaceae*	I	*Poa ampla*	Non-native variety of P. secunda (CRP only)
1	*Pseudoroegneria spicata*	bluebunch wheatgrass	*Poaceae*	N	*Agropyron spicatum*	Deep soils / revegetated fields
4	*Secale cerale*	cereal rye	*Poaceae*	I		
4	*Taeniatherum caput-medusae*	medusahead	*Poaceae*	I		OR "B" noxious weed
4	*Thinopyrum intermedium*	intermediate wheatgrass	*Poaceae*	N	*Agropyron intermedium*	Planted
4	*Triticum aestivum*	common wheat	*Poaceae*	I		
2	*Vulpia bromoides*	brome fescue	*Poaceae*	I	*Festuca bromoides*	
6	*Vulpia myuros*	rat-tail fescue	*Poaceae*	I	*Festuca myuros*	
5	*Collomia grandiflora*	grand colomia	*Polemoniaceae*	N		
6	*Collomia linearis*	tiny trumpet	*Polemoniaceae*	N		
6	*Leptodactylon pungens*	granite prickly phlox	*Polemoniaceae*	N		
2	*Microsteris gracilis var. humilior*	slender phlox	*Polemoniaceae*	N		
5	*Phlox hoodia*	spiny phlox	*Polemoniaceae*	N		
2	*Phlox longifolia*	longleaf phlox	*Polemoniaceae*	N		
5	*Eriogonum compositum*	arrowleaf buckwheat	*Polygonaceae*	N		
5	*Eriogonum douglasii var. douglasii*	Douglas' buckwheat	*Polygonaceae*	N		

Ab	Accepted Scientific Name	Common Name	Family	Nativity	Hitchcock & Cronquist Synonym	Notes
4	*Eriogonum heracleoides*	parsnipflower buckwheat	*Polygonaceae*	N		
4	*Eriogonum sphaerocephalum*	rock buckwheat	*Polygonaceae*	N		
4	*Eriogonum strictum ssp. proliferum var. proliferum*	Blue Mountain buckwheat	*Polygonaceae*	N		
6	*Polygonum aviculare*	prostate knotweed	*Polygonaceae*	I		
5	*Polygonum douglasii*	Douglas' knotweed	*Polygonaceae*	N		
2	*Claytonia perfoliata*	miner's lettuce	*Portulacaceae*	N	*Montia perfoliata*	
5	*Dodecatheon pulchellum*	darkthroat shooting star	*Primulaceae*	N		
2	*Ceratocephala testiculata*	curveseed butterwort	*Ranunculaceae*	I		
5	*Clematis ligusticifolia*	western white clematis	*Ranunculaceae*	N		
3	*Delphinium nuttallianum*	twolobe larkspur	*Ranunculaceae*	N		
6	*Purshia tridentata*	antelope bitterbrush	*Roseaceae*	N		
6	*Rosa woodsii*	Wood's rose	*Ranunculaceae*	N		
6	*Gallium aparine*	stickywilly	*Rubiaceae*	N		
3	*Lithophragma parviflorum*	smallflower woodland-star	*Saxifragaceae*	N		
5	*Castilleja hispida*	harsh Indian paintbrush	*Scrophulariaceae*	N		
2	*Collinsia parviflora*	maiden blue eyed Mary	*Scrophulariaceae*	N		
2	*Orthocarpus tenuis*	hairy Indian paintbrush	*Scrophulariaceae*	N	*Orthocarpus hispidus*	
3	*Verbascum Thapsus*	common mullein	*Scrophulariaceae*	I		
2	*Plectritis macrocera*	longhorn plectritis	*Valerianaceae*	N		

Ab = Abundance Codes:
1 = abundant in multiple plant communities
2 = common in multiple plant communities
3 = uncommon in multiple plant communities
4 = abundant in specific plant communities
5 = common in specific plant communities
6 = uncommon in specific plant communities
7 = rare, with three or fewer separate occurrences on the Project area surveyed

Appendix G. Comprehensive list of all vertebrate wildlife observed during avian use surveys, bat species investigation, special status wildlife species surveys, and raptor nest surveys, including incidental and in-transit sightings, Wheatridge Wind Energy Facility (listed taxonomically within classes).

Common Name	*Scientific Name*	Avian Use Surveys	Bat Species Investi-gation	Special Status Wildlife Surveys	Raptor Nest Survey	Incidental or In-transit
	Birds					
Tundra swan	*Cygnus columbianus*	X				
Canada goose	*Branta canadensis*	X				
California quail	*Callipepla californica*	X		X		X
Chukar	*Alectoris chukar*	X		X		X
Gray partridge	*Perdix perdix*	X		X		
Ring-necked pheasant	*Phasianus colchicus*	X		X		X
Great blue heron	*Ardea herodias*	X		X		
Turkey vulture	*Cathartes aura*	X		X	X	X
Osprey	*Pandion haliaetus*					X
Bald eagle	*Haliaeetus leucocepahlus*	X				
Northern harrier	*Circus cyaneus*	X		X	X	X
Sharp-shinned hawk	*Accipiter striatus*	X				X
Cooper's hawk	*Accipiter cooperii*	X				
Swainson's hawk*	*Buteo swainsoni*	X		X	X	X
Red-tailed hawk	*Buteo jamaicensis*	X		X	X	X
Ferruginous hawk*	*Buteo regalis*	X		X	X	X
Rough-legged hawk	*Buteo lagopus*	X				X
Golden eagle	*Aquila chrysaetos*	X		X	X	X
Greater Sandhill crane	*Grus canadensis tabida*	X				X
Killdeer	*Charadrius vociferous*	X		X		X
Long-billed curlew*	*Numenius americanus*	X		X	X	X
Ring-billed gull	*Larus delawarensis*					X
Rock pigeon	*Columba livia*	X		X		X
Eurasian collared dove	*Streptopelia decaocta*	X				
Mourning dove	*Zenaida macroura*	X		X		X
Barn owl	*Tyto alba*					X
Great horned owl	*Bubo virginianus*			X	X	X
Burrowing owl*	*Athene cunicularia hypugaea*			X		
Short-eared owl	*Asio flammeus*	X		X		X
Common nighthawk	*Chordeiles minor*	X				X
Northern flicker	*Colaptes auratus*	X		X		X
American kestrel	*Falco sparverius*	X		X		X
Merlin	*Falco columbarius*	X				
Peregrine falcon	*Falco peregrinus*	X				X
Prairie falcon	*Falco mexicanus*	X		X	X	X
Gray flycatcher	*Empidonax wrightii*			X		
Say's phoebe	*Sayornis saya*	X		X		X
Eastern kingbird	*Tyrannus tyrannus*	X				
Western kingbird	*Tyrannus verticalis*	X		X		X
Loggerhead shrike*	*Lanius ludovicianus*	X		X		X

Common Name	*Scientific Name*	Avian Use Surveys	Bat Species Investi-gation	Special Status Wildlife Surveys	Raptor Nest Survey	Incidental or In-transit
Northern shrike	*Lanius excubitor*	X				
Black-billed magpie	*Pica hudsonia*	X		X		X
American crow	*Corvus brachyrhynchos*	X				
Common raven	*Corvus corax*	X		X	X	X
Horned lark	*Eremophila alpestris*	X		X		X
Violet-green swallow	*Tachycineta thalassina*	X		X		X
Northern rough-winged swallow	*Stelgidopteryx serripennis*	X		X		
Bank swallow	*Riparia riparia*			X		X
Cliff swallow	*Hirundo pyrrhonota*	X		X		
Barn swallow	*Hirundo rustica*	X		X		X
Red-breasted nuthatch	*Sitta canadensis*			X		
Rock wren	*Salpinctes obsoletus*	X		X		
House wren	*Troglodytes aedon*			X		
Ruby-crowned kinglet	*Regulus calendula*			X		
Mountain bluebird	*Sialia currucoides*	X				
Swainson's thrush	*Catharus ustulatus*			X		
American robin	*Turdus migratorius*	X		X		X
European starling	*Sturnus vulgaris*	X		X		X
American pipit	*Anthus rubescens*	X				
Lapland longspur	*Calcarius lapponicus*	X				
Yellow warbler	*Setophaga petechia*			X		
Chipping sparrow	*Spizella passerina*	X		X		
Brewer's sparrow	*Spizella breweri*	X		X		X
Vesper sparrow	*Pooecetes gramineus*	X		X		X
Savannah sparrow	*Passerculus sandwichensis*	X		X		
Grasshopper sparrow*	*Ammodramus savannarum*	X		X		
Song sparrow	*Melospiza melodia*			X		
White-crowned sparrow	*Zonotrichia leucophrys*	X		X		X
Lazuli bunting	*Passerina cyanea*			X		X
Red-winged blackbird	*Agelaius phoeniceus*	X		X		
Western Meadowlark	*Sturnella neglecta*	X		X		X
Brewer's blackbird	*Euphagus cyanocephalus*	X		X		X
Brown-headed cowbird	*Molothrus ater*			X		X
Bullock's oriole	*Icterus bullockii*	X		X		
Gray-crowned rosy finch	*Leucosticte tephrocotis*	X				
House finch	*Carpodacus mexicanus*	X		X		X
Cassin's finch	*Carpodacus cassinii*	X				
American goldfinch	*Carduelis tristis*	X		X		
House sparrow	*Passer domesticus*	X		X		
	Mammals					
California myotis	*Myotis californicus*		X			
Western small-footed myotis*	*Myotis ciliolabrum*		X			
Long-eared myotis	*Myotis evotis*		X			
Little brown bat	*Myotis lucifugus*		X			
Long-legged myotis	*Myotis volans*		X			

Common Name	*Scientific Name*	Avian Use Surveys	Bat Species Investi-gation	Special Status Wildlife Surveys	Raptor Nest Survey	Incidental or In-transit
Hoary bat*	*Lasiurus cinereus*		X			
Silver-haired bat*	*Lasionycteris noctivagans*		X			
Canyon bat	*Parastrellus hesperus*		X			
White-tailed jackrabbit*	*Lepus townsendii*	X		X		X
Mountain cottontail	*Sylvilagus nuttallii*	X		X		X
Belding's ground squirrel	*Urocitellus beldingi*					X
Washington ground squirrel*	*Urocitellus washingtoni*	X		X		X
Northern pocket gopher	*Thomomys talpoides*	X		X		X
Ord's kangaroo rat	*Dipodomys ordii*	X		X		X
Deer mouse	*Peromyscus maniculatus*			X		X
Bushy-tailed woodrat	*Neotoma cinerea*			X		
Montane vole	*Microtus montanus*	X		X		X
Common porcupine	*Erethizon dorsatum*			X		X
Coyote	*Canis latrans*	X		X	X	X
Long-tailed weasel	*Mustela frenata*					X
American badger	*Taxidea taxus*					X
Elk	*Cervus elaphus*			X		
Mule deer	*Odocoileus hemionus*	X		X	X	X
White-tailed deer	*Odocoileus virginianus*	X		X		X
Pronghorn	*Antilocarpa americana*	X		X		X
Amphibians and Reptiles						
Great Basin spadefoot	*Spea intermontana*			X		X
Western toad	*Bufo boreas*			X		X
Pacific chorus frog	*Pseudacris regilla*	X		X		
Western fence lizard	*Sceloporus occidentalis*			X		
Pygmy short-horned lizard	*Phyrnosoma douglasi*	X				
Racer	*Coluber constrictor*			X		X
Gopher snake	*Pituophis catenifer*			X		X
Common garter snake	*Thamnophis sirtalis*					X
Western rattlesnake	*Crotalus viridis*			X		X

* denotes species of state or federal special status.

Appendix H. Discussion of potential adverse effects of construction and operation of the Wheatridge Wind Energy Facility to wildlife (other than species of concern).

Section 5 of the Ecological Investigations Report identifies and describes the potential adverse effects of the proposed Wheatridge Wind Energy Facility to all plant and vertebrate animal species of concern, including federally Listed, Proposed, or Candidate species, state Endangered or Threatened species, and federal or state Species of Concern. Section 5 also addresses potential adverse effects to mule deer, which, though not having special status, is nonetheless of management concern to ODFW. This appendix supplements those assessments by addressing potential adverse effects of the proposed Project to other species or species groups.

Effects Assessment for Avian Species

This section focuses primarily on potential adverse effects to birds from the operating turbines. The most likely direct effect to birds resulting from the proposed Project is mortality or injury due to collisions with Project turbines. Collisions may occur with resident birds foraging and flying within the area or with birds migrating through the area. Other potential, but infrequent, direct effects that could occur include strikes with Project maintenance vehicles traveling roads throughout the Project site; these are generally difficult to distinguish from collisions with turbines, and are assumed to be less frequent than the latter.

Raptors

Besides ferruginous hawk, Swainson's hawk, bald eagle, golden eagle, peregrine falcon, and burrowing owl (species of concern for which potential adverse effects are addressed in Sections 5a, 5b, and 5c) several other raptor species were present at Wheatridge. These were osprey, sharp-shinned hawk, Cooper's hawk, red-tailed hawk, rough-legged hawk, northern harrier, American kestrel, merlin, and prairie falcon. Owls present were barn owl, great horned owl and short-eared owl. Turkey vulture was also documented.

Raptors tend to exist at low densities, especially during the breeding season when territorial behavior results in intra- and inter-specific spacing of pairs and nests. In addition, for several of the species listed above (bald eagle, osprey, sharp-shinned hawk, Cooper's hawk, and peregrine falcon), little or no typical nesting, roosting, or foraging habitat exists on the Project area. For each of these species—and for merlin and turkey vulture as well—five or fewer detections were recorded during all surveys (Tables 3a and 3b). (Detections of barn owl and great horned owl numbered fewer than five, but survey methods were not designed to detect these nocturnal species.)

Those raptor species for which a much greater number of detections was recorded at Wheatridge were northern harrier, rough-legged hawk, red-tailed hawk, and American kestrel (Tables 3a and 3b). Prairie falcon was recorded on 18 occasions at Wheatridge West (Table 3b) and on seven occasions at Wheatridge East (Table 3b), but this species is largely territorial throughout the year and these detections likely represent a very small number of individuals using the landscape similarly across survey weeks.

For some raptor species, abundance (during pre-construction surveys) is correlated with frequency of collision (NAS, 2007; Kingsley and Whittam, 2007). There are, however, at least two reasons such correlation doesn't always apply. Some raptor species may be less susceptible to collision behaviorally—species that hunt from low perches are less likely to hit rotors than species that hunt from soaring or hovering flight, for example. Other species may successfully avoid turbines, as was documented in a population of bald eagles in Alaska (Sharp et al., 2010) and for migrating golden eagles in British Columbia (Johnston et al., 2014). The other significant factor is among-year variation in population numbers. Raptor numbers may vary

widely between the year of pre-construction survey and the year of fatality monitoring. Regional among-year variation in raptor numbers likewise makes detailed comparison among projects (for which fatality monitoring occurred in different years) problematic. This is especially true for nomadic species (like short-eared owls) and species that show little or no territorial behavior and that can be found in large numbers in years of prey abundance; prominent among these are rough-legged hawk and northern harrier.

Nonetheless, results from fatality studies at existing Columbia Plateau Ecoregion wind energy facilities (Tables 9 and 10) in habitats similar to those at Wheatridge offer insight at a coarse level into the likelihood of collision with turbines for the raptor species recorded there.

For large raptor species that breed locally, a comparison of nest densities—those at Wheatridge with those at other CPE wind farms for which pre-construction raptor nest surveys and fatality monitoring studies have been completed—can also be informative in assessing the potential for fatalities at Wheatridge. It is important, however, to acknowledge the potential for among-year variation in densities of breeding raptors, and not to draw too strong a conclusion from such comparisons. Overall raptor breeding densities at Wheatridge West were quite low compared to the average at other CPE wind farms, and those at Wheatridge East were the lowest among the 19 CPE projects compared (Table 5).

The raptor species most commonly found as fatalities at CPE wind projects are American kestrel and red-tailed hawk, which comprise 2.3% and 2.4%, respectively, of the fatalities found during standard searches at sites for which fatality monitoring has been completed (Table 11). Both of these are common year-round residents, and numbers of both are likely augmented in the winter by migrants from farther north. Both American kestrel and red-tailed hawk were common around the Wheatridge area (Tables 3a and 3b). Nests of red-tailed hawks were generally found in riparian areas at a considerable distance from proposed facilities, with three nests found within two miles of Wheatridge West (Section *4.5.1*; Figure 7a), three nests found within two miles of Wheatridge East (Section *4.5.2*; Figure 7b), and five nests found within two miles of the transmission Intraconnection Line (Section *4.5.3*; Figure 7c).

Based on the abundance of these two common species and on fatality information from other CPE wind energy developments in similar habitat, there is a low to moderate risk of occasional fatalities of American kestrel and red-tailed hawk at Wheatridge West and Wheatridge East. Minimization of this risk has been accomplished by siting turbines as much as possible within developed habitat (Dryland Wheat) and far from identified red-tailed hawk nests. Avoidance of potential disturbance to red-tailed hawk breeding attempts can be accomplished by limiting construction of facilities (within one-quarter mile of active breeding attempts) to outside the breeding season (February through July); it is anticipated that this restriction may be a condition of the Site Certificate.

Short-eared owl is a nomadic species whose seasonal distribution depends upon the abundance of its primary prey, voles (Holt and Leasure, 1993). In seasons of low vole densities, short-eared owl is absent from suitable habitat, whereas in seasons of vole abundance, this species can breed in high densities, defending only the immediate area of its ground nest from others of its kind. For breeding, it requires open grassland habitats, and Revegetated Grassland—including that found at Wheatridge—is suitable nesting habitat for this species. The year of survey at Wheatridge was a year of extremely high abundance of montane vole (*Microtus montanus*), and there were 14 short-eared owl nests detected (during special status vertebrate wildlife species surveys) at Wheatridge West (Section *4.5.1*; Figure 7a) and one nest detected near the transmission Intraconnection Corridor (Section *4.5.3*; Figure 7c).

In years of short-eared owl abundance, this species seems somewhat susceptible to collision with turbine rotors. It hunts on the wing (rather than from a perch) and entirely within open habitats. After American kestrel, red-tailed hawk, and Swainson's hawk (which is discussed in Section 5), it is the raptor species most frequently found as a fatality at Columbia Plateau wind projects, comprising 0.7% of the fatalities found during schedules searches (Table 11). (The transmission Intraconnection Line does not pose a direct risk to this species, but may provide perching opportunities for golden eagle, a potential predator of short-eared owls.)

There is a low to moderate risk of fatalities of short-eared owl at Wheatridge West and Wheatridge East, at least during years in which vole numbers are high. Minimization of this risk has been accomplished through siting turbines as much as possible within Dryland Wheat habitat.

Great horned owls comprise 0.4% of the fatalities found during scheduled searches at CPE wind energy facilities for which fatality monitoring studies have been completed (Table 11). This suggests a moderate level of susceptibility to collision. This species is likely present—at low densities—throughout the Columbia Plateau Ecoregion. Two great horned owl nests were identified within two miles of Wheatridge West (Section *4.5.1*; Figure 7a), and one was found within two miles of the transmission Intraconnection Line (Section *4.5.3*; Figure 7c); none were found within two miles of Wheatridge East (Section *4.5.2*; Figure 7b).

There is a low risk of occasional fatalities of great horned owl at Wheatridge West and Wheatridge East. Minimization of this risk has been accomplished by siting turbines as much as possible within developed habitat (Dryland Wheat) and far from identified great horned owl nests. Avoidance of potential disturbance to great horned owl breeding attempts can be accomplished by limiting construction of facilities (within one-quarter mile of active breeding attempts) to outside the breeding season (January through June).

Rough-legged hawks comprise 0.4% of the fatalities found during scheduled searches at CPE wind energy facilities for which fatality monitoring studies have been completed (Table 11). Rough-legged hawks are only present within the Columbia Plateau from mid-October to mid-April, spending the remainder of the year near breeding grounds in Alaska and northern Canada. Their presence and abundance in winter is dependent on population densities of small mammalian prey (Bechard and Swem, 2002), particularly (in the CPE) montane vole. And because such prey are themselves quite cyclical in their population numbers (Verts and Carraway, 1998), rough-legged hawk numbers vary widely among years (Bechard and Swem, 2002). It is expected that the incidence of collision with turbines by this species will likewise vary among years.

Rough-legged hawk was abundant and widely distributed during the year of avian use survey at Wheatridge. It was detected on numerous occasions at each of the sixteen avian use plots at Wheatridge West (Table 6a) during late fall, throughout winter, and during early spring. At Wheatridge East, it was detected at seven of eight avian use plots throughout winter and into early spring (Table 6b). The winter of survey was one of extremely high vole numbers, and the density of rough-legged hawks was much greater than that normally observed in the general area.

There is a low to moderate risk of fatalities of rough-legged hawk at Wheatridge West and Wheatridge East, at least in winters of peaks in vole numbers. Minimization of this risk has been attempted through siting turbines as much as possible within developed habitat (Dryland Wheat). However, this species tends to soar over and near such habitats more frequently than many other raptor species, likely finding stubble fields on ridges to offer greater thermal lift for initiating soaring than adjacent native habitats in draws.

Northern harrier was common throughout the year, especially during winter and spring, at Wheatridge West (Tables 3a and 4a) and Wheatridge East (Tables 3b and 4b). It was widespread, being observed at all avian use plots (Tables 6a and 6b), but was observed in higher densities at plots characterized by lower percentages of Dryland Wheat. Northern harrier densities vary in relation to the abundance of voles, their primary prey; in addition, they defend only the immediate nest site from conspecifics, roost communally, and sometimes hunt in close proximity to one another (Hamerstrom, 1986). This species is expected to be present year-round in suitable habitats on and near the proposed Wheatridge Wind Energy Facility throughout the Project's life, though not generally in abundances like those observed during the survey winter of 2011-2012.

Despite their presence—and abundance—throughout the Columbia Plateau Ecoregion, northern harriers are only rarely found as fatalities at CPE wind facilities, comprising 0.3% of fatalities during standard searches at sites for which fatality monitoring has been completed (Table 11). Although this species occasionally soars, it spends the vast majority of its time on or near the ground, hunting by coursing low above grasslands and shrub-steppe.

There is a low risk of occasional fatalities of northern harrier at Wheatridge West and Wheatridge East. Minimization of this risk has been accomplished by siting turbines as much as possible within Dryland Wheat.

Prairie falcon was detected at both Wheatridge West and Wheatridge East; though these detections numbered 18 and seven, respectively, they likely represented a small number of individuals. No nests of this species were detected within two miles of either Wheatridge West (Section *4.5.1*; Figure 7a) or Wheatridge East (Section *4.5.2*; Figure 7b), whereas a single nest was detected within two miles of the transmission Intraconnection Line (Section *4.5.3*; Figure 7c).

Despite their presence in low densities throughout most of the Columbia Plateau, prairie falcons are rarely detected as fatalities at CPE wind energy facilities. At projects for which fatality monitoring has been completed, four fatalities have been recorded, one during scheduled searches and three incidentally (i.e., not during scheduled searches; Table 11).

There is a low risk of occasional fatalities of prairie falcon at Wheatridge West and Wheatridge East. Minimization of this risk has been accomplished by siting turbines as much as possible within Dryland Wheat. Avoidance of potential disturbance to prairie falcon breeding attempts can be accomplished by limiting construction of facilities (within one-half mile of active breeding attempts) to outside the breeding season (March through July).

For all other raptor species detected at Wheatridge, risk of adverse effects from the proposed Project is deemed to be low. Sharp-shinned hawk, Cooper's hawk, and turkey vulture have all been found as fatalities in the CPE, but together they comprise just 0.3% of the fatalities found during scheduled searches (Table 11). Two owls species—long-eared owl and western screech-owl—comprise 0.2% and 0.1%, respectively, of the fatalities found during scheduled searches at CPE wind projects (Table 11); neither of these was detected during surveys at Wheatridge, but they may nonetheless use portions of the Project infrequently.

Passerines

For passerine species of concern found at Wheatridge—loggerhead shrike and grasshopper sparrow—potential adverse effects were addressed in Sections 5a, 5b, and 5c.

Passerines constituted the most abundant avian species group at Wheatridge West, where they comprised between73.78% (in spring) and 78.83% (summer) of avian species composition (Table 4a), and at Wheatridge East, where they comprised between 80.30% (in fall) and 95.52% (winter) of avian species composition (Table 4b). Passerines are also the group most frequently detected as fatalities at wind projects in the Columbia Plateau Ecoregion (Table 11).

Although passerines are a large and diverse group, a single species—horned lark—accounts for most of the passerine use of the area around the proposed Project. At Wheatridge West, horned lark comprised between 48.61% (in spring) and 66.29% (winter) of all avian detections (Table 4a). At Wheatridge East, it comprised between 48.55% (in spring) and 80.80% (winter) of all avian detections (Table 4b).

Horned lark has likewise been the species that has dominated the passerine fatality composition at wind projects throughout the region, as it comprises 31.5% of all observed CPE avian fatalities (Table 11). Horned lark has been the most numerous fatality found at every CPE site studied to date with the exception of Klondike II (NWC and WEST, 2007), where golden-crowned kinglet outnumbered horned lark in fatality composition (21.05% to 15.79%).

Horned lark is also the species most frequently encountered as a fatality at wind projects nationally. It is an abundant species with a very broad distribution; pairs can successfully raise three broods in a single year, and it can utilize a broad range of open habitats, including developed monocultures (like Dryland Wheat) that are of little use to most other avian species. Outside the breeding season—and particularly in winter—horned larks join together in large flocks. Although this species forages on the ground, daily movements include flights that may reach to heights that include the rotor sweep of most turbines; during courtship, it engages in a flight display that involves an upward spiral that likewise reaches rotor height, making it susceptible to collision.

As at all other wind projects in the Columbia Plateau Ecoregion, horned lark is at moderate to high risk of collision with turbine rotors and is the species most at risk. Siting of turbines within Dryland Wheat habitat—an effective method of risk minimization for most species—is unlikely to prevent fatalities of this species. Nonetheless, based on its local, regional, and overall abundance, the risk of collision at the proposed Project is not deemed to constitute a significant adverse effect to horned lark populations.

For some other passerines, the frequency of encountering a species as a fatality at other CPE wind projects (Table 11) is likely a better indicator of the potential risk associated with the operation of Wheatridge than is the documented use of Wheatridge by passerine species. The species that is second to horned lark in terms of observed fatalities in the CPE is golden-crowned kinglet; this forest species is not normally detected through avian use studies, and likely collides with turbines while migrating at night. On the other hand, common raven is commonly recorded during pre-construction surveys at nearly all regional wind projects, yet is rarely found as a fatality (Table 11); under most circumstances, ravens quickly learn skills of a spatial nature (Boarman and Heinrich, 1999) and are apparently adept at avoiding spinning turbine rotors. Thus, golden-crowned kinglet is likely at greater risk than common raven, despite the lack of detections of the former and the relative abundance of the latter.

In general, however, the mean use as recorded during diurnally-conducted point counts is a reliable predictor of avian fatalities (Downes et al., 2009), and the number of passerine fatalities at Wheatridge West and Wheatridge East are expected to be within the range of fatalities recorded at other Columbia Plateau Ecoregion wind projects (Table 10).

Waterfowl and Other Waterbirds

For greater Sandhill crane, the single waterbird species of concern found at Wheatridge, potential adverse effects of the proposed Project are addressed in Sections 5a and 5b.

The Project area does not contain habitat that attracts waterfowl and other waterbirds, and avian use surveys resulted in very few detections. Two geese were detected in spring, and two flocks of tundra swan (totaling 26 individuals) were detected in winter at Wheatridge West; a single great blue heron was observed flying across Wheatridge West in summer (Table 3a).

Nationally, waterfowl fatalities at land-based wind facilities have been low compared to overall use (Kingsley and Whittam, 2007; NWCC, 2010). Wind projects with year-round waterfowl use have shown the highest waterfowl fatalities, although levels of waterfowl/waterbird fatalities appear minor compared to use of the sites by these groups.

Based on the lack of observed use of the Project area and the low susceptibility of this group to collision with turbines, the risk of the Wheatridge Wind Energy Facility to waterfowl and other waterbirds is extremely low. The Applicant has further minimized potential risk by siting turbines as much as possible in developed (Dryland Wheat) habitat.

Shorebirds

Besides long-billed curlew (which breeds in grasslands of the intermountain West and for which potential adverse effects are addressed in Sections 5a, 5b, and 5c), killdeer was the only shorebird species detected at the proposed Project. During avian use surveys, a single individual was detected in summer at Wheatridge West (Table 3a) and a single individual was detected in fall at Wheatridge East (Table 3b).

Shorebirds are rarely found as fatalities at wind projects despite their documented presence at most wind projects during pre-construction surveys. In the Columbia Plateau Ecoregion, a single killdeer was found as a fatality during a scheduled search at Leaning Juniper I (Gritski et al., 2008).

Based on the low use of the Project area and the low susceptibility of this group to collision with turbines, the likelihood of significant adverse effects to shorebirds at the Wheatridge Wind Energy Facility is very low. The Applicant has further minimized potential risk by siting turbines as much as possible in developed (Dryland Wheat) habitat.

Upland Game Birds

Three species of non-native upland game birds—introduced to provide hunting opportunities—are found in habitats within and around the proposed Project area. During avian use surveys at Wheatridge West, ring-necked pheasant was recorded in spring, summer, and fall, and chukar was recorded during fall (Table 3a). During surveys at Wheatridge East, gray partridge was recorded during spring, summer, and fall, and chukar was recorded during summer (Table 3b).

Some upland game mortality has been documented at wind projects (Enk et al., 2010; Enk et al., 2011; Erickson et al., 2001; Erickson et al., 2004; Erickson et al., 2007; Gritski and Kronner, 2010; Gritski et al., 2010a; Jeffrey et al., 2009a; Kronner et al., 2008a), and these three species are the game bird species most frequently observed as fatalities at CPE wind projects (Table 11). It is likely that mortalities occur through striking turbine rotors, through colliding with turbine towers (as when startled at night by a predator), and through strikes with vehicles traveling through wind projects.

Based on habitat present, results from fatality monitoring at other regional wind projects, and the presence of a few chukar and ring-necked pheasant within the Wheatridge West area and chukar and gray partridge within the Wheatridge East area, there is potential for mortality of some upland game birds to occur during operation of the proposed Project. Minimization of potential risk has been accomplished by siting turbines as much as possible within Dryland Wheat habitat.

Effects Assessment for Bats

Besides hoary bat, silver-haired bat, California myotis, small-footed myotis, long-eared myotis, and long-legged myotis (species of concern for which potential adverse effects are addressed in Sections 5a, 5b, and 5c), two other bat species were documented at Wheatridge. These were little brown bat and canyon bat (Section 4.12). Other species—not recorded during the bat inventory study—could also occasionally utilize the Project.

The primary adverse effect of wind projects to bats is direct mortality through collision with turbines, although barotrauma (rapid pressure changes that cause severe internal organ damage) near fast-moving rotors has been raised as a possible cause of death as well (Baerwald et al., 2008). Estimates of annual bat fatalities at Columbia Plateau wind projects are listed in Table 12; although these estimates are far lower than those at many wind projects in the Midwest, East, and Southeastern United States, it is not clear whether this is just an artifact of smaller bat densities in the West. Concern about bat fatalities at wind projects is based in a lack of knowledge about population numbers and in their generally low reproductive rates (and thus likely population-level sensitivity to this relatively novel source of mortality).

The results from fatality monitoring at Columbia Plateau wind projects shows a pronounced seasonality to bat collisions, with 85% of fatalities occurring between August and October, with the peak in September (Figure 13). This period coincides with the late summer dispersal and fall migration of hoary bat and silver-haired bat, the two species that together comprise more than 95% of bat fatalities identified to species in the CPE (Table 13).

Canyon bat has not been found as a fatality at any of the CPE wind projects for which fatality monitoring studies have been completed (Table 13) despite its being relatively common throughout the region. During foraging and other flights, this species likely remains entirely at heights below the minimum height of rotor tips where it is not at any risk of collision. Construction and operation of the proposed Wheatridge Wind Energy Facility does not pose a significant risk to canyon bat.

Little brown bat is infrequently found as a fatality at other wind projects in the region; it comprises 1.0% of 738 fatalities found during standardized searches at CPE wind projects for which fatality monitoring studies have been completed (Table 13). This species tends to forage and fly below turbine rotor height. Little brown bat faces a low risk of collision with turbines at the Wheatridge Wind Energy Facility. The Applicant has further minimized this risk by siting turbines as much as possible within developed (Dryland Wheat) habitat.

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Attachment P-2:

Revegetation Plan (Draft Concepts)

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Wheatridge Wind Energy Facility

Revegetation Plan
(Draft Concepts)

Prepared for:

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Prepared by:

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April 2015

I. Introduction

This document has been prepared for the Wheatridge Wind Energy Facility (Wheatridge, WWEF, or Project) Site Certificate Application (SCA) submitted to the Oregon Department of Energy (ODOE). It provides primary concepts for meeting the needs for revegetation following Project construction and will be finalized (by ODOE) into a formal Revegetation Plan, authored by the ODOE before issuance of the Site Certificate. The concepts provided here are consistent with approved plans in place for other Oregon wind projects in similar habitats, in particular those that are permitted through the State process and the Oregon Energy Facility Siting Council (OEFSC or the Council). The Leaning Juniper II, Stateline, and Montague Revegetation Plans, and available revegetation monitoring reports for wind and natural gas energy projects served as models for the Wheatridge concepts.

The WWEF Revegetation Plan, which has been developed in consultation with personnel from the Oregon Department of Fish and Wildlife, delineates practices and standards for restoring to preconstruction conditions or better those areas temporarily disturbed during construction of the Project; it does not apply to areas permanently occupied by Project facilities. Such restoration is a requirement of the Site Certificate.

The amounts and types of habitats expected to be disturbed during Project construction are described in Exhibit P of the Site Certificate Application; they are also described in Attachment P-3, the Draft Habitat Mitigation Plan. These will include agricultural and other developed lands (collectively referred to as cropland) and grassland, shrub-steppe, and other habitats (collectively referred to as wildlife habitat). This plan addresses both restoration of croplands and restoration of wildlife habitat. For wildlife habitat in particular, it describes planting methods, monitoring requirements, success criteria, and remedial actions (in case success criteria are not met).

Throughout Project construction and revegetation activities, the Developer will take appropriate actions to prevent the spread of noxious weeds (as identified in Morrow County Ordinance No. MC-C-3-90 and No. MC-C-2-99 Appendices A and B). Where appropriate, and pursuant to consultation with the county weed control managers, monitoring of the establishment of noxious weeds and of the effectiveness of weed control or eradication may be performed in concert with the revegetation monitoring described in this document.

II. Project Site Description

The Project is located primarily in Morrow County, with a small portion in Umatilla County, Oregon. It lies within the Columbia Plateau Ecoregion, entirely on public land and primarily in agricultural land used for growing dryland wheat. Native vegetation has been modified by historical and current livestock grazing, by changes in fire regimes, and by the presence of exotic grasses and other vegetation.

Primary soil types include Mikkalo, Willis, Ritzville, and Warden, and land cover types are Developed (Dryland Wheat, Revegetated Grassland, and Other Developed), Grassland (Exotic Annual and Native Perennial), and Shrub-steppe (Basin Big Sagebrush and Snakeweed/Rabbitbrush).

III. Revegetation Methods

Revegetation will begin as soon as feasible after completion of construction, and seeding and planting will be done in a timely manner and in the appropriate season. Agricultural land restoration methods will likely be designed in consultation with the landowner. Soil preparation will involve standard, commonly-used methods, and will take into account all relevant site-specific factors, including slope, size of area, and erosion potential. Topsoil will be restored to the preconstruction condition or better. Mulching and other erosion control measures will be used throughout construction and during revegetation efforts. Preconstruction land use, soil, and vegetation type will dictate the seed mix used for each area to be restored; the wildlife habitat seed mixes used will be finalized in consultation with ODFW and will comply with the Oregon Seed Law.

1. Seed Planting Methods

Methods and timing of planting will be appropriate to the seed mix, weather conditions, and site conditions (including area size, slope, and erosion potential). Preparation of disturbed ground may include replacing lost topsoil and/or chemical or mechanical weed control. Two common application methods for non-cropland are described below.

a) Broadcasting

In this method, the seed mix will be broadcast at specified application rates. Broadcasting should not be utilized when winds exceed five miles per hour. If feasible, half of the seed mix will be broadcast in one direction, with the other half broadcast perpendicular to the first half. A tracking dye may be added to facilitate uniform application. Certified weed-free straw will be applied at a rate of two tons per acre immediately after seeding; straw may either be crimped into the ground or applied with a tackifier.

b) Drilling

In this method, seed will be planted using an agricultural or range seed drill according to application rates recommended by the seed supplier.

IV. Restoration of Cropland

It is expected that croplands will be reseeded with the appropriate crop or maintained as fallow in consultation with the landowner or farm operator. The holder of the Site Certificate will also consult with the landowner or farm operator to determine seed mix and application methods and rates for seed and fertilizer. Success of cropland revegetation will have been achieved when production of the revegetated area is comparable to that of adjacent non-disturbed croplands. Success determination will involve consultation with the landowner or farm operator, and the holder of the Site Certificate will report to ODOE on the success of cropland restoration efforts.

V. Restoration of Wildlife Habitat

All disturbed grassland, shrub-steppe, and other wildlife habitat will be reseeded with a mix of native or native-like grasses, forbs, and shrubs characteristic of the area prior to construction disturbance. Seed mix and application rates will be determined in consultation

with the landowner and ODFW, and will take into consideration soil types, erosion potential, and growing conditions. The seed mix will be approved by ODOE, and seeds will be obtained from a reputable supplier in compliance with the Oregon Seed Law.

VI. Monitoring

1. Revegetation Record

Records will be kept of revegetation efforts, both for croplands and for wildlife habitat; records will include:

- Date construction was completed
- Description of the affected area
- Date revegetation was initiated
- Description of the revegetation effort

The holder of the Site Certificate will update these records periodically as revegetation work occurs, and will provide ODOE with copies of these records with submission of the annual report required by the Site Certificate.

2. Monitoring Procedures

Monitoring of the revegetation effort will be conducted by an independent botanist or revegetation specialist; this monitoring will be done during the first growing season after planting (Year 1), and again in Years 3 and 5. Nearby reference sites (approximating pre-construction conditions) will be selected as targets toward which revegetation will aim. Monitoring will not be required for areas that have been converted by the landowner to land uses that preclude meeting revegetation success criteria.

Weed Control

A qualified investigator will be employed to annually assess weed growth during the first five years of revegetation work and to make recommendations on weed control measures. Reports will be submitted to the holder of the Site Certificate, to ODOE, and to ODFW following each annual inspection. These reports will identify areas and describe extent of weed growth and describe the success of control measures. At the time of the year-5 report, the investigator will consult with ODOE, ODFW, and the holder of the Site Certificate to design an appropriate plan for subsequent weed control.

Wildlife Habitat Recovery

In the first growing season after planting of areas to be revegetated, a qualified independent investigator (botanist or revegetation specialist) will inspect each wildlife habitat revegetation area to assess the success of revegetation measures. These assessments will be repeated in Year 3 and Year 5. Annual reports will be submitted to the holder of the Site Certificate, to ODOE, and to ODFW. Assessments will address whether each wildlife habitat revegetation area is trending toward meeting the success criteria described below.

In consultation with ODFW, reference sites—areas of habitat and quality similar to those found prior to disturbance at the areas to be revegetated—will be established to represent target conditions for revegetation areas. During each assessment, revegetated areas will be compared to reference sites with regard to:

- Presence and density of weeds
- Degree of erosion
- Vegetative density
- Proportion of desirable vegetation
- Species diversity and structural stage of desirable vegetation

Reference sites will be chosen with consideration to land use patterns, soil types, terrain, and presence of noxious weeds. It is expected that a variety of reference sites will be required to represent the range of disturbed areas for which revegetation is required. New reference sites may be chosen if land use changes, wildfire, or other disturbance makes a chosen reference site no longer representative of target conditions.

Based on the Year 5 assessment, the holder of the Site Certificate will consult with ODOE and ODFW to design an action plan for subsequent years. The holder of the Site Certificate may propose remedial actions and/or additional monitoring for areas that have not met the success criteria. Alternatively, revegetation efforts may in some cases be deemed to have failed, and mitigation may be proposed in such cases to compensate for habitat loss.

3. Success Criteria

Each annual report will involve an assessment of the progress toward revegetation objectives of each area of wildlife habitat disturbed during Project construction. The overarching metric for success is when the habitat quality is equal to or better than the quality at the relevant reference site according to the conditions described above. Final determination of whether the holder of the Site Certificate has met the revegetation obligations will be made by ODOE.

4. Remedial Action

Remedial action options will be identified in cases where success criteria are not met, whether due to wildfire subsequent to Project construction or because of lower than expected rates of germination or survival. Remedial actions may include reseeding or other measures. The investigator will make recommendations for remedial actions after each monitoring visit, and the holder of the Site Certificate will take appropriate measures to meet the restoration objectives. The holder of the Site Certificate will annually report the investigator's recommendations for remedial actions and the measures taken. ODOE may require reseeding or other remedial actions in cases where revegetation objectives have not been met.

VII. Plan Amendment

It is expected that the completed Revegetation Plan will make provision for an amendment process that would depend upon the agreement of all concerned parties. In particular, this Plan may be amended—without requiring an amendment to the Site Certificate—by agreement between the Oregon Energy Facility Siting Council (OEFSC) and the holder of the Site Certificate.

Attachment P-3:

Habitat Mitigation Plan (Draft Concepts)

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Wheatridge Wind Energy Project

Habitat Mitigation Plan
(Draft Concepts)

Prepared for:

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April 2015

I. Introduction

This document has been prepared for the Wheatridge Wind Energy Project (Project) Site Certificate Application (SCA) submitted to the Oregon Department of Energy (ODOE). It provides primary concepts for meeting Project development habitat mitigation needs and will be finalized into a formal Habitat Mitigation Plan (HMP). The proposed concepts were discussed with personnel from the Oregon Department of Fish and Wildlife (ODFW) on August 20, 2012 and on July 11, 2014.

The Wheatridge Wind Energy Project is located in Morrow and Umatilla Counties, Oregon. As part of the SCA (Exhibits P and Q), Northwest Wildlife Consultants, Inc. (NWC) completed habitat mapping and quality assessment of the Project area, and conducted site-specific biological studies that included rare plant surveys, avian use surveys, special status vertebrate wildlife species surveys, golden eagle and other raptor nest surveys, an inventory of bat species, and big game observations, as well as reviews for potential occurrence of or records of special status species. No wetlands, perennial streams or other aquatic habitats are addressed in this document because at the time of preparation (August 2014) no facilities are planned for these habitat types. Project impact estimates were provided by Wheatridge Wind Energy, LLC and their SCA contractor, Tetra Tech. Based on a combination of the results of the multi-year biological studies, experience with such mitigation, and knowledge of the wildlife and habitats impacted by wind and natural gas energy development in the Columbia Plateau since 1992, NWC offers the concepts in this document as recommendations for inclusion in the Project's final Habitat Mitigation Plan. Details on habitat types, subtypes, and Categories 1–6 can be found in the SCA, Exhibit P and in the Wheatridge ecological investigations report (Gerhardt and Anderson, 2014). The Applicant is reducing and eliminating the impact of the proposed Project over time by preserving and maintaining in-kind habitat in the Columbia Basin ecoregion to achieve a net benefit to Category 2 habitat and no net loss of Category 3, and 4, Details are discussed in this document.

II. Description of Project Impacts Addressed by the Plan

As presently designed (as of November 13, 2014), the Wheatridge Wind Energy Facility (Project) will be constructed within a landscape of approximately 13,100 acres of privately-owned land and will have a generating capacity of up to 500 megawatts and use an array of up to 292 wind turbines. The Project consists of two groups of wind turbines, 'Wheatridge West' and 'Wheatridge East,' and a connecting 230-kilovolt overhead transmission line (the 'Intraconnection Line'); each of these involve other supporting facilities such as roads and underground electrical lines.

Oregon Administrative Rule (OAR) 635-415-0025, the Wildlife Habitat Mitigation Policy, defines habitats based on type, quality, availability, and usefulness/importance to wildlife, and establishes mitigation goals and implementation standards for each. As further described in the SCA Exhibit P, Category 1 habitat, which is defined as irreplaceable, essential, and limited, includes habitat within 785 feet of documented Washington ground squirrels. The Project was designed and microsited to avoid all mapped Category 1 upland

habitat, and based on that information, no Project facilities or activities will impact such habitat.

Category 2 habitat is defined by OAR 635-415-0025 as essential and limited, and NWC identified small amounts of such habitat within the Project area based on these criteria and the value of such lands to wildlife generally and, in particular, to species of special state or federal status. The OAR specifies net benefit be achieved for Category 2 impacts and defines this as "an increase in overall in-proximity habitat quality or quantity after a development action and any subsequent mitigation measures have been completed and monitored."

In 2013, ODFW began to consider all land (except developed and agriculture such as cropland) that lies within designated big game winter range as Category 2. This leads to the inclusion of additional Category 2 habitat in the Project impacts. For habitat impacts (permanent and temporary) associated with this (big game) Category 2, the mitigation described in this plan will be coupled with minimization best practices during construction to attain the goal of no net loss and a net benefit.

Most of the Project's footprint (area to be covered by permanent facilities) will occupy dryland agriculture, which is Category 6 habitat. The rest of the footprint will occupy Category 2, Category 3 (Revegetated Grassland, Native Perennial Grassland, Basin Big Sagebrush Shrub-steppe, or Rabbitbrush/Buckwheat Shrub-steppe) or Category 4 (Exotic Annual Grassland) habitats.

In addition to the permanent impacts mentioned above, construction of the Project will entail temporary impacts to the same types and categories of habitat. Temporary impacts are summarized as follows: no Category 1 impacts, a small amount of impact to Category 2 habitat (based on ground assessment and definitions in OAR 635-415-0025), additional impacts to Category 2 (based on location within big game winter range), some Category 3 and Category 4 impacts, and mostly Category 6 impacts. Grassland habitats (Category 3 and 4) are expected to require three to five years after disturbance from construction activities to recover to a mature state of grassland cover. Native forbs in perennial grasslands (as well as in shrub-steppe) may not recover to pre-construction diversity or will take longer to recolonize the restored areas. Shrub-steppe habitats (Category 2 and 3) may take much longer to achieve the shrub species maturity and height that existed prior to construction (ten to fifty years).

III. Calculation of the Size of the Mitigation Area

The Habitat Mitigation Area (HMA) must be large enough and have the characteristics to meet the standards set in OAR 635-415-0025. These standards include "no net loss" and a "net benefit" in habitat quality and quantity for Category 2 habitats, and "no net loss" of habitat for Categories 3 and 4. Mitigation standards for Category 6 involve minimizing direct habitat loss and avoiding impacts to off-site habitat.

For the purposes of this discussion, the acreages of impact are the current estimate of the maximum affected area (the permanent and temporary impacts). The actual areas of

disturbance will be determined based on the final design layout of the Project. It is anticipated that ODOE and ODFW will require that they be provided with the final design layout and the associated impact acreages prior to the beginning of Project construction.

The following tables delineate current maximum habitat impact acreage estimates of each of the three components of the Wheatridge Wind Energy Project.

Wheatridge West

Habitat Category	Permanent Impacts	Temporary Impacts
Category 2	3.6	19.7
Category 2 (big game)	21.3	135.8
Category 3	13.5	91.5
Category 4	1.8	11.6
Category 6*	88.6	534.3
Total Impacted Acres	128.9	792.9

* no mitigation required

Wheatridge East

Habitat Category	Permanent Impacts	Temporary Impacts
Category 2	5.6	33.6
Category 2 (big game)	0.4	3.1
Category 3	3.8	26.4
Category 4	1.8	11.7
Category 6*	29.9	185.7
Total Impacted Acres	41.5	260.5

* no mitigation required

Transmission Intraconnection Line

Habitat Category	Permanent Impacts	Temporary Impacts
Category 2	0.0	4.1
Category 2 (big game)	0.4	62.6
Category 3	0.1	16.8
Category 4	0.0	2.5
Category 6*	0.4	58.0
Total Impacted Acres	0.9	144.0

* no mitigation required

Based on these impact estimates, calculation of the mitigation area required (under the maximum layout) are as follows:

Wheatridge West

Category 2
Footprint: 3.6 acres (2:1 ratio)
Temporary impacts: 19.7 acres (>1:1 ratio)
Mitigation area required: (3.6 x 2) + (>19.7) = >26.9

Category 2 (Big Game)
Footprint: 21.3 acres (>1:1 ratio)
Temporary impacts:* revegetated grassland 91.5 (1:1); exotic annual grassland 12.5 (1:1); native perennial grassland 31.8 (1:1)
Mitigation area required: > 21.3 + (91.5 + 12.5 + 31.8) = >157.2 acres

Category 3
Footprint: 13.5 acres (1:1 ratio)
Temporary impacts: revegetated grassland 60.7 (0:1); native perennial grassland 28.7 (0.5:1 ratio); shrub-steppe 2.1 (0.5:1)
Mitigation area required: 13.5 acres + (0.0 + 14.4 + 1.0) = 28.9 acres

Category 4
Footprint: 1.8 acres (1:1 ratio)
Mitigation area required: 1.8 acres

Total mitigation area required (Wheatridge West, to nearest whole acre): >215

* For temporary habitat loss within designated deer winter range, mitigation will be coupled with impact minimization and revegetation efforts to attain the goal of no net loss and a net benefit.

Wheatridge East

Category 2
Footprint: 5.6 acres (2:1 ratio)
Temporary impacts: 33.6 acres (>1:1 ratio)
Mitigation area required: (5.6 x 2) + (>33.6 x 1) = >44.8 acres

Category 2 (Big Game)
Footprint: 0.4 acres (>1:1 ratio)
Temporary impacts: exotic annual grassland 0.8 (1:1); native perennial grassland 2.3 (1:1)
Mitigation area required: >(0.4 + (0.8 + 2.3) = >3.5 acres

Category 3
Footprint: 3.8 acres (1:1 ratio)
Temporary impacts: revegetated grassland 0.0 (0:1); native perennial grassland and shrub-steppe 26.4 (0.5:1 ratio)
Mitigation area required: 3.8 acres + (0.0 + 13.2) = 17.0 acres

Category 4
Footprint: 1.8 acres (1:1 ratio)
Mitigation area required: 1.8 acres

Total mitigation area required (Wheatridge East, to nearest whole acre): >67

Transmission Intraconnection Line

Category 2
Footprint: 0.0 acres (2:1 ratio)
Temporary impacts: 4.1 acres (>1:1 ratio)
Mitigation area required: (0.0 x 2) + (>4.1 x 1) = >4.1 acres

Category 2 (Big Game)
Footprint: 0.4 acres (>1:1 ratio)
Temporary impacts:* revegetated grassland 11.5 (1:1); exotic annual grassland 1.4 (1:1); native perennial grassland 35.5 (1:1); shrub-steppe 14.2 (1:1)
Mitigation area required: > 0.4 + (11.5 + 1.4 + 35.5 + 14.2) = > 63.0 acres

Category 3
Footprint: 0.1 acres (1:1 ratio)
Temporary impacts: revegetated grassland 7.2 (0:1); native perennial grassland and shrub-steppe 9.6 (0.5:1 ratio)
Mitigation area required: 0.1 acres + (0.0 + 4.8) = 4.9 acres

Category 4
Footprint: 0.0 acres (1:1 ratio)
Mitigation area required: 0.0 acres

Total mitigation area required (Transmission Intraconnection, to nearest whole acre): >72

* For temporary habitat loss within designated deer winter range, mitigation will be coupled with impact minimization and revegetation efforts to attain the goal of no net loss and a net benefit.

Total mitigation area required (all three Project components): >354 acres

IV. Description of the Habitat Mitigation Area (HMA)

According to ODFW standards, areas appropriate for mitigation of Category 2 and Category 3 habitat impacts must be "in proximity" to the Project and have potential for habitat enhancement. The applicant has identified more than 360 acres of suitable habitat for consideration by ODFW and ODOE (map submitted separately). These include Native Perennial Grassland, Revegetated Grassland, Basin Big Sagebrush Shrub-steppe, Rabbitbrush/Buckwheat Shrub-steppe, and Exotic Annual Grassland habitats of varying quality. There are opportunities for implementing habitat enhancement actions, as needed for the final habitat mitigation compliance. NWC has confirmed that the parcels under current consideration have adequate potential for mitigating the habitat loss expected to occur and for providing benefit for the wildlife species that use the habitats impacted by habitat loss associated with the Project, including big game. All of the habitat proposed for use as mitigation lies within designated deer winter range. The referenced acreages for mitigation will be discussed with ODFW.

V. Habitat Enhancement Actions

Habitat designated for mitigation will be conserved and protected from alteration for the life of the Project. Besides such legal protection to insure no development, actions that are proposed for enhancement of the mitigation area include

- Livestock grazing will be restricted from the HMA to ensure that habitat is maximally useful to wildlife;
- The holder of the Site Certificate will work with the landowner to control or eradicate noxious weeds.
- Revegetation with native plants—sagebrush and bunch grasses—will occur in proportion to the acres of sagebrush and native grassland habitats lost through Project construction.
- A plan for fire response and control will be in place and applied to the HMA.
- Where old barbed wire fence on the HMA presents potential problems for wildlife, the holder of the Site Certificate will work with the landowner to remove such fencing.
- Habitat protection will involve restricting any uses of the mitigation area that would be inconsistent with the goals of no net loss of habitats in Categories 2, 3, and 4 and a net benefit to Category 2 habitat quantity or quality.

Enhancement activities are expected to apply specifically to the approximately 80 acres of the HMA required as compensation for those habitat impacts outside of deer winter range. The other 226 acres are deemed sufficient compensation for the big game Category 2 habitat impacts. The habitat within the HMA is currently of superior quality to most of the habitat to be impacted within deer winter range. Moreover, the majority of those impacted acres (those with temporary impacts) will be restored within three to five years to better condition than they were prior to construction, as required as part of the Revegetation Plan.

VI. Monitoring

1. Procedures

The holder of the Site Certificate will hire a qualified, independent investigator (wildlife biologist, botanist, or revegetation specialist) to conduct a comprehensive program of monitoring the HMA and the success of its protection and (within applicable acres) enhancements. Annual monitoring will include assessments of:

- Amount and quality of vegetation
- Success of weed control measures
- Degree of recovery of native grasses and forbs
- Success of revegetation measures (where applicable)
- Special status species present

Methods and results of all monitoring will be reported to ODOE and ODFW on an annual basis, along with a report of the mitigation/enhancement measures undertaken that year.

2. Success Criteria

The goal of the habitat mitigation described herein is to protect and enhance a sufficient quantity of habitat to meet ODFW standards of no net loss of habitat Category 3 and Category 4 and a net gain in habitat quantity and quality of Category 2. Habitat protection alone—apart from enhancement—will not be deemed to meet the net-benefit criterion for Category 2 habitat. The minimum amount of habitat protection and enhancement required will be calculated as in Section 3 above using the impact acreages associated with the final Project design. If sufficient high-quality habitat is not available for protection, habitat mitigation goals can be achieved by enhancing the required amount of habitat to bring it up to the higher category. Criteria for assessing such a category improvement will include density and quality of native vegetation of the appropriate types (desirable forbs and bunchgrasses, e.g.) success of weed control, and increased use of the area by native bird or mammal species with special status. If the holder of the Site Certificate desires to base habitat improvement on increased avian or other wildlife use, then baseline studies will need to be conducted on the habitat mitigation area in the spring of Year 1 or Year 2.

Habitat protection and enhancement must endure for the life of the Project. That is, even after habitat protection and enhancement has been achieved, periodic monitoring must take place to assess whether protection and enhancement persists at levels commensurate with mitigation goals. Should habitat quality fall below that prescribed by the Habitat Management Plan, the holder of the Site Certificate will, in consultation with ODFW and ODOE, propose remedial actions for compensating for such a failure to meet mitigation goals.

VII. Amendment of the Plan

This Habitat Mitigation Plan may be amended by agreement of the holder of the Site Certificate and the Oregon Energy Facility Siting Council. Amendments to this Plan will not require an amendment of the Site Certificate.

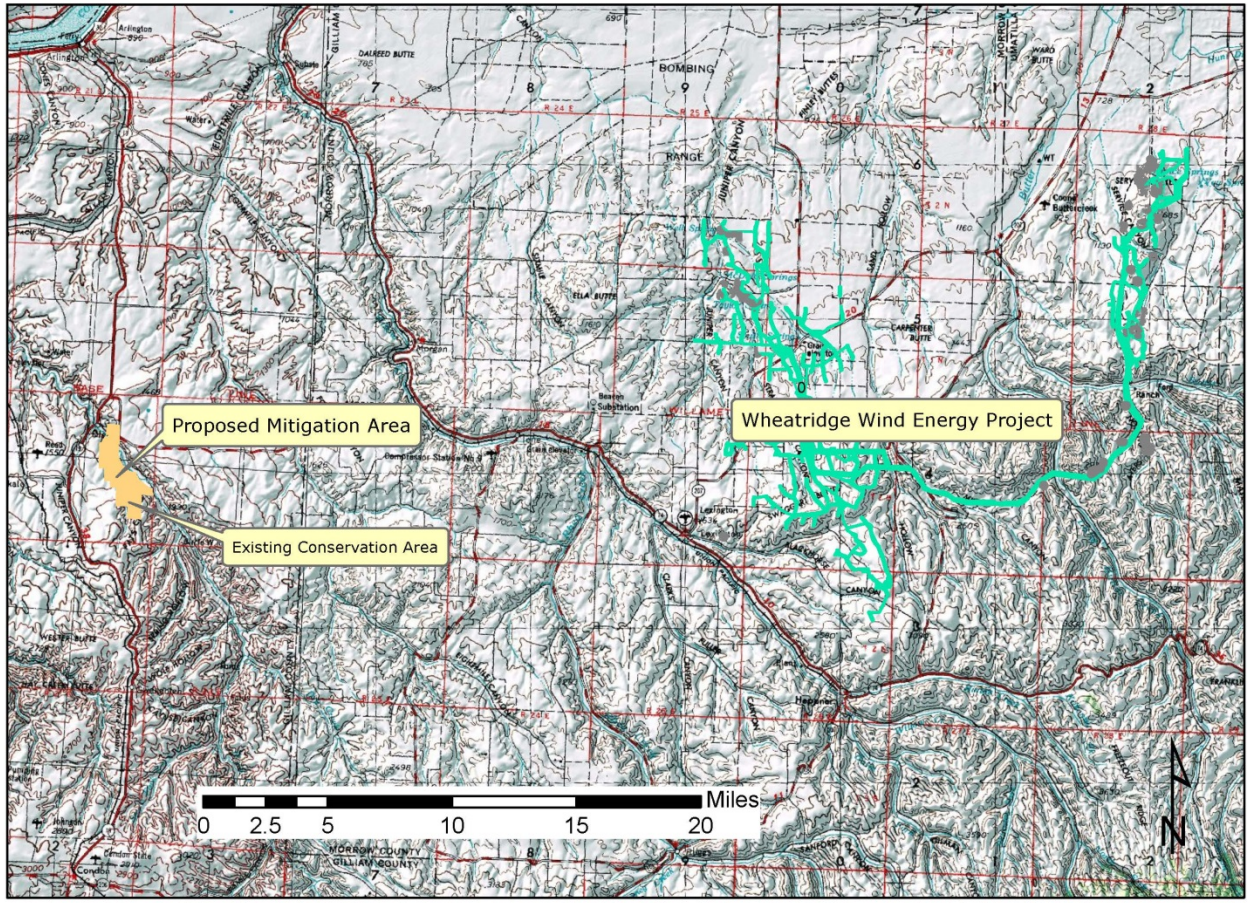

Figure 1. Overview Map: Habitat Mitigation Area for the Wheatridge Wind Energy Project.

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Attachment P-4:

Wildlife Monitoring and Mitigation Plan (Draft Concepts)

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Attachment P-4

Wheatridge Wind Energy Project

Proposed Concepts for Wildlife Monitoring and Mitigation Plan

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December 14, 2014

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Introduction

This document has been prepared for the Wheatridge Wind Energy Facility (WWEF or Project) Site Certificate Application (SCA) submitted to the Oregon Department of Energy (ODOE). It provides primary concepts for meeting the operations phase wildlife monitoring and mitigation needs and will be finalized (by ODOE) into a formal Wildlife Monitoring and Mitigation Plan (WMMP), taking into account the objectives for such monitoring of the Oregon Department of Fish and Wildlife (ODFW) and the United States Fish and Wildlife Service (USFWS).

The concepts provided herein are consistent with approved plans in place for other Oregon wind projects, in particular those that are permitted through the State process and the Energy Facility Siting Council. For most such plans in the Oregon Columbia Plateau, the objective has been to provide information useful for determining the impacts of construction and operation of wind energy facilities on wildlife in general—and on birds and bats in particular. As a result of such studies, a wealth of information is available, and the species and relative proportions of birds and bats impacted by wind development in the Oregon Columbia Plateau is now well established.

For this reason, and because multiple-species monitoring has often led to a suboptimal understanding of impacts to particular species of special conservation concern, the USFWS has established guidelines (USFWS, 2012) to facilitate the identifying and addressing such species and the potential impacts to them. For the Wheatridge Wind Energy Facility, pre-construction information reviews and field investigations (Gerhardt et al., 2014) followed those guidelines, as did subsequent siting and micrositing of facilities (Exhibits P and Q of the Wheatridge Site Certificate Application). The conclusion of this process led to discussions with USFWS centering on the potential risk of the Project to golden eagle, discussions that likely will lead to an Eagle Conservation Plan and an Eagle Take Permit. In that case, the methods described in this Plan (especially fatality monitoring and mitigation) may—prior to the beginning of construction of the Project—be tailored specifically to golden eagles and other large raptors.

Wheatridge Wind Energy, LLC (Wheatridge) proposes to construct the Wheatridge Wind Energy Facility on portions of approximately 13,100 acres of privately-owned land in Morrow and Umatilla Counties, Oregon. The Project will have a generating capacity of up to 500 megawatts (MW), using an array of up to 292 wind turbines. The Project consists of two groups of wind turbines, called 'Wheatridge West' and 'Wheatridge East,' and an intraconnection corridor connecting the Wheatridge West and Wheatridge East wind turbine groups with one or two 230 kilovolt (kV) overhead transmission lines. A detailed Project description can be found in Exhibit B of the Wheatridge Site Certificate Application, and detailed maps of the Project site boundary and Project facilities can be found in Exhibit C.

This plan describes wildlife monitoring that the certificate holder shall conduct during operation of the Project. Monitoring objectives of the formal study are to determine whether the facility causes significant fatalities of birds and bats and to determine whether the facility results in a loss of habitat quality. Objectives of continued recording, handling and

reporting of incidentally discovered injured or dead wildlife are to meet the standards specified in any other requirement (federal, state, county) for understanding and documenting species found over time.

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

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

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

Component #1 is of shorter duration whereas #2 is periodic for a longer period and #3 if for the life of the project. Based on the results of the monitoring program, mitigation of significant impacts may be required. The selection of the mitigation actions should allow for flexibility in creating appropriate responses to monitoring results that cannot be known in advance. If the Department determines that mitigation is needed, the certificate holder shall propose appropriate mitigation actions to ODOE and shall carry out mitigation actions approved by ODOE, subject to review by the Oregon Energy Facility Council (Council).

1. Fatality Monitoring

(a) Definitions and Methods

Seasons

This plan uses the following dates for defining seasons:

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

Search Plots

The investigators shall conduct fatality monitoring within search plots. The certificate holder, in consultation with the Oregon Department of Fish and Wildlife, shall select search plots based on a systematic sampling design that ensures that the selected search plots are representative of the habitat conditions in different parts of the site. Each search plot will

contain one turbine. Search plots will be square or circular. Circular search plots will be centered on the turbine location; radius will be determined with regard to maximum blade tip height and species of concern. Square search plots will be of sufficient size to contain a circular search plot as described above. The certificate holder shall provide maps of the search plots to ODOE before beginning fatality monitoring at the facility. The certificate holder shall use the same search plots for each search conducted during a monitoring year.

Scheduling

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

In each monitoring year, the investigators shall conduct fatality monitoring searches at the rates of frequency shown below. Over the course of one monitoring year, the investigators will conduct 16 searches, as follows:

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

Sample Size

The sample size for fatality monitoring is the number of turbines searched per monitoring year. The investigators shall conduct fatality monitoring during each monitoring year in search plots at one-third of the turbines that are built or 50 turbines, whichever is greater. If fewer than 50 turbines are built, the certificate holder shall search all turbines.

Duration of Fatality Monitoring

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

If fatality rates for the first year of monitoring at the WWEF materially exceed any of the thresholds of concern or the range of fatality rates found at other wind power facilities in the region, the certificate holder shall propose additional mitigation for ODOE and ODFW review within 6 months after reporting the fatality rates to the ODOE. Alternatively, the certificate holder may opt to conduct a second year of fatality monitoring immediately if the certificate

holder believes that the results of Year 1 monitoring were anomalous. If the certificate holder takes this option, the investigators still must perform the monitoring in Year 5 of operations as described above.

(b) Removal Trials

The objective of the removal trials is to estimate the length of time avian and bat carcasses remain in the search area. Estimates of carcass removal rates will be used to adjust carcass counts for removal bias. “Carcass removal” is the disappearance of a carcass from the search area due to predation, scavenging, or other means, such as farming activity.

The investigators shall conduct carcass removal trials within each of the seasons defined above during the first year of fatality monitoring. For each trial, the investigators shall use 10 to 15 carcasses of small- and large-bodied species. Trial carcasses shall be distributed within habitat categories and subtypes in proportion to their amounts within search plots.

After the first year of fatality monitoring, the investigators may reduce the number of removal trials and the number of removal trial carcasses during any subsequent year of fatality monitoring, subject to the approval of the Department. The investigators must show that the reduction is justified based on a comparison of the first year removal data with published removal data from nearby wind energy facilities.

The investigators shall use game birds or other legal sources of avian species as test carcasses for the removal trials, and the investigators may use carcasses found in fatality monitoring searches. The investigators shall select species with the same coloration and size attributes as species found within the site boundary. If suitable trial carcasses are available, trials during the fall season will include several small brown birds to simulate bat carcasses. Legally obtained bat carcasses will be used if available.

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

An approximate schedule for assessing removal status is once daily for the first 4 days, and on days 7, 10, 14, 21, 28 and 35. This schedule may be adjusted depending on actual carcass removal rates, weather conditions and coordination with the other survey work. The condition of scavenged carcasses will be documented during each assessment, and at the end of the trial all traces of the carcasses will be removed from the site. Scavenger or other activity could result in complete removal of all traces of a carcass in a location or distribution of feathers and carcass parts to several locations. This distribution will not constitute removal if evidence of the carcass remains within an area similar in size to a search plot and if the evidence would be discernable to a searcher during a normal survey.

Before beginning removal trials for any subsequent year of fatality monitoring, the certificate holder shall report the results of the first year removal trials to ODOE and ODFW. In the report, the certificate holder shall analyze whether four removal trials per year, as

described above, provide sufficient data to accurately estimate adjustment factors for carcass removal. The number of removal trials may be adjusted up or down, subject to the approval of ODOE.

(c) Searcher Efficiency Trials

The objective of searcher efficiency trials is to estimate the percentage of bird and bat fatalities that searchers are able to find. The investigators shall conduct searcher efficiency trials on the fatality monitoring search plots in both grassland/shrub-steppe and cultivated agriculture habitat types. A pooled estimate of searcher efficiency may be used—if sample sizes are too small for some habitat types—to adjust carcass counts for detection bias.

The investigators shall conduct searcher efficiency trials within each of the seasons defined above during the years in which the fatality monitoring occurs. Each trial will involve approximately 4 to 15 carcasses. The searchers will not be notified of carcass placement or test dates. The investigators shall vary the number of trials per season and the number of carcasses per trial so that the searchers will not know the total number of trial carcasses being used in any trial. In total, approximately 80 carcasses will be used per year, or approximately 15 to 25 per season.

For each trial, the investigators shall use small- and large-bodied species. The investigators shall use game birds or other legal sources of avian species as test carcasses for the efficiency trials, and the investigators may use carcasses found in fatality monitoring searches. The investigators shall select species with the same coloration and size attributes as species found within the site boundary. If suitable test carcasses are available, trials during the fall season will include several small brown birds to simulate bat carcasses. Legally obtained bat carcasses will be used if available. The investigators shall mark the test carcasses to differentiate them from other carcasses that might be found within the search plot and shall use methods similar to those used to mark removal test carcasses as long as the procedure is sufficiently discreet and does not increase carcass visibility.

The certificate holder shall distribute trial carcasses in varied habitat in rough proportion to the habitat types within the facility site. On the day of a standardized fatality monitoring search (described below) but before the beginning of the search, investigators will place efficiency trial carcasses randomly within search plots (one to three trial carcasses per search plot) within areas to be searched. If scavengers appear attracted by placement of carcasses, the carcasses will be distributed before dawn.

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

The number and location of the efficiency trial carcasses found during the carcass search will be recorded. The number of efficiency trial carcasses available for detection during each trial will be determined immediately after the trial by the person responsible for distributing the carcasses. Following plot searches, all traces of test carcasses will be removed from the site.

If new searchers are brought into the search team, additional searcher efficiency trials will be conducted to ensure that detection rates incorporate searcher differences. The certificate holder shall include a discussion of any changes in search personnel and any additional detection trials in the reporting required under Section 4 of this plan.

Before beginning searcher efficiency trials for any subsequent year of fatality monitoring, the certificate holder shall report the results of the first year efficiency trials to ODOE and ODFW. In the report, the certificate holder shall analyze whether the efficiency trials as described above provide sufficient data to accurately estimate adjustment factors for searcher efficiency. The number of searcher efficiency trials for any subsequent year of fatality monitoring may be adjusted up or down, subject to the approval of ODOE.

(d) Fatality Monitoring Search Protocol

The objective fatality monitoring is to estimate the number of bird and bat fatalities that are attributable to facility operation as an indicator of the impact of the facility on habitat quality. The goal of bird and bat fatality monitoring is to estimate fatality rates and associated variances. The investigators shall perform fatality monitoring using standardized carcass searches according to the schedule described above.

Personnel trained in proper search techniques ("the searchers") will conduct the carcass searches by walking concentric or parallel transects (with transect width determined by the species of concern) within search plots. Search area and speed may be adjusted by habitat type after evaluation of the first searcher efficiency trial.

Searchers shall flag all avian or bat carcasses discovered. Carcasses are defined as a complete carcass or body part, 10 or more feathers or three or more primary feathers in one location. When parts of carcasses and feathers from the same species are found within a search plot, searchers shall make note of the relative positions and assess whether or not these are from the same fatality.

All carcasses (avian and bat) found during the standardized carcass searches will be photographed, recorded and labeled with a unique number. Searchers shall make note of the nearest two or three structures (turbine, power pole, fence, building or overhead line) and the approximate distance from the carcass to these structures. The species and age of the carcass will be determined when possible. Searchers shall note the extent to which the carcass is intact and estimate time since death. Searchers shall describe all evidence that might assist in determination of cause of death, such as evidence of electrocution, vehicular strike, wire strike, predation or disease. When assessment of the carcass is complete, all traces of it will be removed from the site.

Each carcass will be bagged and frozen for future reference and possible necropsy or (if the carcass is fresh and whole) for use in trials. A copy of the data sheet for each carcass will be kept with the carcass at all times. For each carcass found, searchers will record species, sex and age when possible, date and time collected, location, condition (e.g., intact, scavenged, feather spot) and any comments that may indicate cause of death. Searchers will photograph each carcass as found and will map the find on a detailed map of the search area showing the location of the wind turbines and associated facilities. The certificate

holder shall coordinate collection of state endangered, threatened, sensitive or other state protected species with ODFW. The certificate holder shall coordinate collection of federally listed endangered or threatened species and Migratory Bird Treaty Act protected avian species with the U.S. Fish and Wildlife Service. The certificate holder shall obtain appropriate collection permits from ODFW and USFWS.

The investigators shall calculate fatality rates using the statistical methods described in Section (f), except that the investigators may use different notation or methods that are mathematically equivalent with prior approval of ODOE. In making these calculations, the investigators may exclude carcass data from the first search of each turbine plot (to eliminate possible counting of carcasses that were present before the turbine was operating).

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

On an annual basis, the certificate holder shall report an estimate of fatalities in eight categories: (1) all birds, (2) small birds, (3) large birds, (4) raptors, (5) grassland birds, (6) nocturnal migrants, (7) state and federally listed threatened and endangered species and State Sensitive Species listed under OAR 635-100-0040 and (8) bats. The certificate holder shall report annual fatality rates on both a per-MW and per-turbine basis.

(e) Incidental Finds and Injured Birds

The searchers might discover carcasses incidental to formal carcass searches (e.g., while driving within the project area). For each incidentally discovered carcass, the searcher shall identify, photograph, record data and collect the carcass as would be done for carcasses within the formal search sample during scheduled searches. If the incidentally discovered carcass is found within a formal search plot, the fatality data will be included in the calculation of fatality rates. If the incidentally discovered carcass is found outside a formal search plot, the data will be reported separately. The certificate holder shall coordinate collection of incidentally discovered state endangered, threatened, sensitive or other state protected species with ODFW. The certificate holder shall coordinate collection of incidentally discovered federally-listed endangered or threatened species and Migratory Bird Treaty Act protected avian species with the USFWS.

The certificate holder shall develop and follow a protocol for handling injured birds. Any injured native birds found on the facility site will be carefully captured by a trained project biologist or technician and transported to a qualified rehabilitation specialist approved by ODOE.[1] The certificate holder shall pay costs, if any, charged for time and expenses related

[1] Approved specialists include Lynn Tompkins (wildlife rehabilitator) of Blue Mountain Wildlife, a wildlife rehabilitation center in Pendleton, and the Audubon Bird Care Center in Portland. The certificate holder must obtain

to care and rehabilitation of injured native birds found on the site, unless the cause of injury is clearly demonstrated to be unrelated to the facility operations.

(f) Statistical Methods for Fatality Estimates (Shoenfeld Estimator)

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

(1) The observed number of carcasses found during standardized searches during the two monitoring years for which the cause of death is attributed to the facility.[2]
(2) Searcher efficiency expressed as the proportion of planted carcasses found by searchers.
(3) Removal rates expressed as the estimated average probability a carcass is expected to remain in the study area and be available for detection by the searchers during the entire survey period.

Definition of Variables

The following variables are used in the equations below:

c_i the number of carcasses detected at plot *i* for the study period of interest (e.g., one year) for which the cause of death is either unknown or is attributed to the facility

n the number of search plots

k the number of turbines searched (includes the turbines centered within each search plot and a proportion of the number of turbines adjacent to search plots to account for the effect of adjacent turbines on the search plot buffer area)

$\bar{c}$ the average number of carcasses observed per turbine per year

s the number of carcasses used in removal trials

s_c the number of carcasses in removal trials that remain in the study area after 35 days

se standard error (square of the sample variance of the mean)

t_i the time (days) a carcass remains in the study area before it is removed

$\bar{t}$ the average time (days) a carcass remains in the study area before it is removed

d the total number of carcasses placed in searcher efficiency trials

p the estimated proportion of detectable carcasses found by searchers

ODOE approval before using other specialists.
[2] If a different cause of death is not apparent, the fatality will be attributed to facility operation.

I the average interval between searches in days

$\hat{\pi}$ the estimated probability that a carcass is both available to be found during a search and is found

m_t the estimated annual average number of fatalities per turbine per year, adjusted for removal and observer detection bias

C nameplate energy output of turbine in megawatts (MW)

Observed Number of Carcasses

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

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

Estimation of Carcass Removal

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

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

This estimator is the maximum likelihood estimator assuming the removal times follow an exponential distribution and there is right-censoring of data. Any trial carcasses still remaining at 35 days are collected, yielding censored observations at 35 days. If all trial carcasses are removed before the end of the trial, then s_c is 0, and $\bar{t}$ is just the arithmetic average of the removal times. Removal rates will be estimated by carcass size (small and large), habitat type and season.

Estimation of Observer Detection Rates

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

Estimation of Facility-Related Fatality Rates

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

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

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

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

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

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

The final reported estimates of *m*, associated standard errors and 90% confidence intervals will be calculated using bootstrapping (Manly 1997). Bootstrapping is a computer simulation technique that is useful for calculating point estimates, variances and confidence intervals for complicated test statistics. For each iteration of the bootstrap, the plots will be sampled with replacement, trial carcasses will be sampled with replacement, and $\bar{c}$, $\bar{t}$, p, $\hat{\pi}$ and m will be calculated. A total of 5,000 bootstrap iterations will be used. The reported estimates will be the means of the 5,000 bootstrap estimates. The standard deviation of the bootstrap estimates is the estimated standard error. The lower 5th and upper 95th percentiles of the 5000 bootstrap estimates are estimates of the lower limit and upper limit of 90% confidence intervals.

Nocturnal Migrant and Bat Fatalities

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

(g) Mitigation

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

Mitigation may be appropriate if fatality rates exceed a "threshold of concern." [3] For the purpose of determining whether a threshold has been exceeded, the certificate holder shall calculate the average annual fatality rates for species groups after each year of monitoring. Based on current knowledge of the species that are likely to use the habitat in the area of the facility, the following thresholds apply to the WWEF:

Species Group	**Threshold of Concern** (fatalities per MW)
Raptors (All eagles, hawks, falcons and owls, including burrowing owls.)	0.09
Raptor species of special concern (Swainson's hawk, ferruginous hawk, peregrine falcon, golden eagle, bald eagle, burrowing owl.)	0.06
Grassland species (All native bird species that rely on grassland habitat and are either resident species occurring year round or species that nest in the area, excluding horned lark, burrowing owl and northern harrier.)	0.59
State sensitive avian species listed under OAR 635-100-0040 (Excluding raptors listed above.)	0.2
Bat species as a group	2.5

If the data show that a threshold of concern for an avian species group has been exceeded, the certificate holder shall implement mitigation if ODOE determines that mitigation is appropriate based on analysis of the data, consultation with ODFW, and consideration of any other significant information available at the time. In addition, ODOE may determine that mitigation is appropriate if fatality rates for individual avian or bat species (especially State Sensitive Species) are higher than expected and at a level of biological concern. If ODOE determines that mitigation is appropriate, the certificate holder, in consultation with ODOE and ODFW, shall propose mitigation measures designed to benefit the affected species. This may take into consideration whether the mitigation required or provided in conjunction with raptor nest monitoring, habitat mitigation, or other components of the *Wildlife Monitoring and Mitigation Plan* or *Habitat Mitigation Plan*, would also benefit the affected species.

The certificate holder shall implement mitigation as approved by ODOE, subject to review by the Council. ODOE may recommend additional, targeted data collection if the need for

[3] The Council adopted "thresholds of concern" for raptors, grassland species, and state sensitive avian species in the Final Order on the Application for the Klondike III Wind Project (June 30, 2006) and for bats in the Final Order on the Application for the Biglow Canyon Wind Farm (June 30, 2006). As explained in the Klondike III order: "Although the threshold numbers provide a rough measure for deciding whether the Council should be concerned about observed fatality rates, the thresholds have a very limited scientific basis. The exceeding of a threshold, by itself, would not be a scientific indicator that operation of the facility would result in range-wide population level declines of any of the species affected. The thresholds are provided in the Wildlife Monitoring and Mitigation Plan to guide consideration of additional mitigation based on two years of monitoring data."

mitigation is unclear based on the information available at the time. The certificate holder shall implement such data collection as approved by the Council.

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

If the data show that the threshold of concern for bat species as a group has been exceeded, the certificate holder shall implement mitigation if ODOE determines that mitigation is appropriate based on analysis of the data, consultation with ODFW, and consideration of any other significant information available at the time. For example, if the threshold for bat species as a group is exceeded, the certificate holder may contribute to Bat Conservation International or to a Pacific Northwest bat conservation group to fund new or ongoing research in the Pacific Northwest to better understand wind facility impacts to bat species and to develop possible ways to reduce impacts to the affected species.

2. Raptor Nest Surveys

The objectives of raptor nest surveys are: (1) to estimate the size of the local breeding populations of raptor species that nest on the ground or aboveground in trees or other aboveground nest locations in the vicinity of the facility; and (2) to determine whether there are noticeable changes in nesting activity or nesting success in the local populations of the following raptor species: Swainson's hawk, golden eagle, ferruginous hawk and burrowing owl.

The certificate holder shall conduct short-term and long-term monitoring. The investigators will use aerial and ground surveys to evaluate nest success by gathering data on active nests, on nests with young, and on young fledged.

(a) Short-Term Monitoring

Short-term monitoring will be done in two monitoring seasons. The first monitoring season will be in the first raptor nesting season after completion of construction of the facility. The second monitoring season will be in the fourth year after construction is completed. The certificate holder shall provide a summary of the first-year results in the monitoring report described in Section 4. After the second monitoring season, the investigators will analyze two years of data compared to the baseline data.

During each monitoring season, the investigators will conduct a minimum of one aerial and one ground survey for raptor nests in late May or early June and additional surveys as described in this section. The survey area is the area within the facility site and a 2-mile

buffer zone around the site. For the ground surveys while checking for nesting *success* (conducted within the facility site and up to a maximum of ½ mile from the facility site), nests outside the leased project boundary will be checked from an appropriate distance where feasible, depending on permission from the landowner for access.

All nests discovered during pre-construction surveys and any nests discovered during post-construction surveys, whether active or inactive, will be given identification numbers. Global positioning system (GPS) coordinates will be recorded for each nest. Locations of inactive nests will be recorded because they could become occupied during future years.

Determining nest *occupancy* may require one or two visits to each nest. Aerial surveys for nest occupancy will be conducted within the facility site and a 2-mile buffer. For occupied nests, the certificate holder will determine nesting *success* by a minimum of one ground visit to determine the species, number of young and young fledged within the facility site and up to ½ mile from the facility site. "Nesting success" means that the young have successfully fledged (the young are independent of the core nest site).

(b) Long-Term Monitoring

In addition to the two years of post-construction raptor nest surveys described in Section 2(a), the investigators shall conduct long-term raptor nest surveys at 5-year intervals for the life of the facility.[4] Investigators will conduct the first long-term raptor nest survey in the raptor nesting season of the ninth year after construction is completed and will repeat the survey at 5-year intervals thereafter. In conducting long-term surveys, the investigators will follow the same survey protocols as described above in Section 2(a) unless the investigators propose alternative protocols that are approved by ODOE. In developing an alternative protocol, the investigators will consult with ODFW and will take into consideration other raptor nest monitoring conducted in adjacent areas. The investigators will analyze the data—as a way of determining trends in the number of raptor breeding attempts the facility supports and the success of those attempts—and will submit a report after each year of long-term raptor nest surveys.

3. Wildlife Reporting and Handling System

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

All avian and bat carcasses discovered by maintenance personnel will be photographed and data will be recorded as would be done for carcasses within the formal search sample during scheduled searches. If maintenance personnel discover incidental finds, the maintenance personnel will notify a project biologist. The Project biologist (or the Project biologist's experienced wildlife technician) will collect the carcass or will instruct maintenance

[4] As used in this plan, "life of the facility" means continuously until the facility site is restored and the site certificate is terminated in accordance with OAR 345-027-0110.

personnel to have an on-site carcass handling permittee collect the carcass. The certificate holder's on-site carcass handling permittee must be a person who is listed on state and federal scientific or salvage collection permits and who is available to process (collect) the find on the day it is discovered. The find must be processed on the same day as it is discovered.

During the years in which fatality monitoring occurs, if maintenance personnel discover incidental finds outside the search plots for the fatality monitoring searches, the data will be reported separately from fatality monitoring data. If maintenance personnel discover carcasses within search plots, the data will be included in the calculation of fatality rates. The maintenance personnel will notify a project biologist. The Project biologist will collect the carcass or will instruct maintenance personnel to have an on-site carcass handling permittee collect the carcass. As stated above, the on-site permittee must be available to process the find on the day it is discovered. The certificate holder shall coordinate collection of state endangered, threatened, sensitive or other state protected species with ODFW. The certificate holder shall coordinate collection of federally-listed endangered or threatened species and Migratory Bird Treaty Act protected avian species with the USFWS.

4. Data Reporting

The certificate holder will report wildlife monitoring data and analysis to the ODOE for each calendar year in which wildlife monitoring occurs. Monitoring data include fatality monitoring program data, raptor nest survey data, and WRHS data. The certificate holder may include the reporting of wildlife monitoring data and analysis in the annual report required under OAR 345-026-0080 or submit this information as a separate document at the same time the annual report is submitted. In addition, the certificate holder shall provide to ODOE any data or record generated in carrying out this monitoring plan upon request by ODOE.

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

5. Amendment of the Plan

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

Exhibit Q

Threatened and Endangered Species

Prepared for

Wheatridge Wind Energy, LLC

Wheatridge Wind Energy Facility

July 2015

Prepared by

Northwest Wildlife Consultants, Inc.

and

TETRA TECH

Tetra Tech, Inc.

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List of Figures

Terms and Definitions

Applicant or Wheatridge	Wheatridge Wind Energy, LLC
Collector lines	34.5 kV lines conveying power from the turbines to the substation
Construction Yard	The temporary area for construction activities and Project equipment storage
Intraconnection Line(s)	Overhead electrical 230 kV line(s) connecting the Project substations in Wheatridge East and Wheatridge West.
Intraconnection Corridor	The intraconnection transmission line corridor connecting Wheatridge East with Wheatridge West
Gen-tie Line	230 kV line conveying power from the Project to an interconnection point with the grid; to be permitted/built by UEC or UEC/CB
Met tower	permanent meteorological tower
O&M building	Operations and Maintenance building
Project	Wheatridge Wind Energy Facility
Site access road	private roads constructed or improved for the purpose of accessing wind turbine sites and associated Project facilities
Site boundary	The boundary within which all Project facilities will be constructed, also known as the micrositing corridor
Substation	Facility in which power from the wind turbines is aggregated, stepped up in voltage, and connected into the Intraconnection Line(s) or the Gen-Tie Line(s)
Survey corridor	the survey corridor only
Turbine	A collective term for foundation, tower, nacelle, blades and rotor that comprise a wind turbine generator
Turbine pad	A cleared, graveled area around the base of each turbine
Wheatridge East	The eastern group of Project turbines
Wheatridge West	The western group of Project turbines

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1.0 Introduction

Wheatridge Wind Energy, LLC (Wheatridge) proposes to construct the Wheatridge Wind Energy Facility (Project) on approximately 13,100 acres of privately-owned land in Morrow and Umatilla Counties, Oregon. The Project will have a generating capacity of up to 500 megawatts (MW), using an array of up to 292 wind turbines. The Project consists of two groups of wind turbines, called 'Wheatridge West' and 'Wheatridge East,' and an Intraconnection Corridor connecting the Wheatridge West and Wheatridge East wind turbine groups with one or two 230-kilovolt (kV) overhead transmission lines. A detailed Project description can be found in Exhibit B, and detailed maps of the Project site boundary and Project facilities can be found in Exhibit C.

This exhibit provides the information required by Oregon Administrative Rule (OAR) 345-021-0010(1)(q) regarding state and federal threatened and endangered plant and animal species that might be affected by the proposed Project.

This exhibit also addresses the requirements of OAR 345-022-0070, which requires that:

The Council, after consultation with appropriate state agencies, must find that:

(1) For plant species that the Oregon Department of Agriculture [ODA] has listed as threatened or endangered under ORS [Oregon Statute] 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."

1.1 Analysis Area

The analysis area for state and federal listed, candidate, and proposed species is the Project area (as of March 2011 with additions in 2012) and lands within 5 miles (8 kilometers) of the Project area. This includes the site boundary and lands within 5 miles thereof. Desktop reviews were applied to, and surveys conducted on, leased lands on which Project facilities were ultimately not sited (the site boundary is smaller than the Project boundary on which ecological studies were designed). Figure Q-1 shows the analysis area for state and federal listed, candidate, and proposed species.

1.2 Applicable Regulations

1.2.1 Oregon

Oregon Administrative Rules, Oregon Statutes, and state technical guidance relevant to threatened and endangered plants and wildlife include the following.

OAR 345-021-0010(1)(q), which details the required components of Exhibit Q, including (A) identification of all potentially affected threatened or endangered species, (B) a description of the occurrences of such species in the analysis area, (C) a description of measures proposed to avoid or reduce adverse impact, (D) a description of how the Project and associated mitigation measures comply with relevant ODA plant protection and conservation programs, or (E) in the absence of ODA programs, a description of how the Project is not likely to cause a significant reduction in the likelihood of survival or recovery of listed plant species, (F) a description of potential impacts to threatened or endangered animal species and evidence that the proposed facility, including mitigation, is not likely to cause a significant reduction in the likelihood of survival or recovery of the species, and (G) the applicant's proposed post-construction monitoring program for impacts to threatened and endangered species.

OAR 345-022-0060, which specifies that in order to issue a site certificate the Energy Facility Siting Council (EFSC) must find that the design, construction, and operation of the proposed facility, taking into account mitigation, are consistent with the fish and wildlife habitat mitigation goals and standards of OAR 635-415-0025 that have been in effect since September 1, 2000.

OARs 635-415-0000 through -0025, which establish goals and standards for mitigating impacts to fish and wildlife habitat caused by development.

The Oregon Endangered Species Act (ORS 496.171 through 496.192 and 498.026), which prohibits "take" of state threatened and endangered wildlife species. "Take" is defined as "to kill or obtain possession or control." Jurisdiction of this act is limited to lands owned or leased by the state and lands over which the state has easements. Endangered species management is limited to state agencies.

OARs 564-100 through -120, which prohibit "take" of state threatened or endangered plants without prior permission of the landowner.

1.2.2 Federal

Federal laws and technical guidance relevant to threatened and endangered plant and wildlife species include the following.

The Endangered Species Act (ESA), which prohibits "take" (including significant habitat modification or degradation) of any threatened or endangered species. For projects that could result in adverse effects to such species, the ESA offers provisions for allowing "take" through Section 7 ("Incidental Take") consultation and Section 10 (Habitat Management Plan) consultation.

The USFWS Land-Based Wind Energy Guidelines (USFWS) 2012, which provides a tiered process for assessing potential and actual impacts on species of concern, and for identifying and implementing ways to avoid, minimize and compensate for those impacts.

The Oregon Columbia Plateau Ecoregion Wind Energy Siting and Permitting Guidelines (USFWS 2008), which establish principles for the siting and permitting processes in Sherman, Wasco, Gilliam, Morrow, and Umatilla Counties.

1.3 Agency Consultation

Consultation and communication with personnel from the Oregon Department of Fish and Wildlife (ODFW) and the United States Fish and Wildlife Service (USFWS) regarding the presence on and use of the Project area by threatened and endangered plant and wildlife species included the following:

- The investigations components overview (study plan; NWC 2012) was submitted by the Applicant to ODFW District Biologist Steve Cherry (of the Heppner District office) and to personnel at the La Grande field office of the USFWS in early August 2012.
- These study components were discussed during a site tour held June 29, 2011 (when the Project was part of a larger proposed project). Agency personnel present included Steve Cherry (ODFW) and Suzanne Anderson and Gary Miller (USFWS).
- Another site tour was conducted on August 20, 2012; Steve Cherry and Suzanne Anderson were again present.
- Results of wildlife studies were presented to USFWS personnel (Suzanne Anderson, Gary Miller, and Matthew Stuber) at a meeting in LaGrande on February 20, 2014.
- The *Wheatridge Ecological Investigations Report* (Gerhardt and Anderson 2014) was submitted to ODFW and USFWS in early October 2014.

2.0 Identification of Species—OAR 345-021-0010(1)(q)(A)

Identification of state or federal listed, proposed, or candidate species that might be affected by the proposed facility involved a combination of literature review and the familiarity of Northwest Wildlife Consultants, Inc. (NWC) personnel with the region. Field studies were then designed to verify the presence/absence of such species.

2.1 Initial Desktop Review

The USFWS lists of endangered, threatened, proposed, and candidate species, and species of concern for Morrow and Umatilla Counties were accessed in March 2011 and again in December 2012. In addition, records of rare, threatened, and endangered plant and wildlife species were requested from the Oregon Biodiversity Information Center (ORBIC) in early 2011. The area for which records were requested was the Project and a 10-mile (16.12 km) buffer of the Project boundary as of March 2011 (with small additions in 2012). The 10-mile buffer was specifically for

golden eagle (and bald eagle) nesting information. For all other species, only results within 5 miles (8.06 km) of the Project boundary were used for compiling a list of species of possible occurrence.

This exercise resulted in a list of four threatened or endangered species—one plant, one mammal, and two fish—with the potential for occurrence within 5 miles of the Project. These species are Laurent's milkvetch (*Astragalus collinus* var. *laurentii*), Washington ground squirrel (*Urocitellus washingtoni*s), bull trout (*Salvelinus confluentus*; federal threatened species), and steelhead (*Oncorynchus mykiss*; Middle Columbia River summer run; federal threatened species). Of these, bull trout and steelhead have no potential for occurrence within the Project site boundary.

Based on range maps, and although ORBIC had no record of them within the analysis area, four ODA candidate plant species were included by NWC botanists in the list of species with potential for occurrence on the Project. These are dwarf suncup (*Cammisonia pygmaea*), disappearing monkeyflower (*Mimulus evanescens*), liverwort monkeyflower (*Mimulus jungermannioides*), and vernal pool mousetail (*Myosurus sessilis*).

The complete USFWS Morrow and Umatilla County lists, tables of the ORBIC results, and tables compiled by NWC of wildlife, fish, and plant species with potential for occurrence on the Project can be found in Attachment P-1, the *Wheatridge Ecological Investigations Report* (Gerhardt and Anderson 2014).

2.1.1 Listed, Candidate, and Proposed Wildlife

2.1.1.1 Washington Ground Squirrel

Washington ground squirrel is endangered in the state of Oregon and a federal candidate for listing. The ORBIC database included numerous historical records within 5 miles of each turbine group and the Intraconnection Corridor, and NWC personnel were aware of the existence of suitable habitat and the likelihood of the presence of this species within the leased land area on which studies were planned.

2.1.2 Listed, Candidate, and Proposed Fish

2.1.2.1 Bull Trout

Bull trout is a federally threatened species, one which falls under the jurisdiction of the USFWS. This species is listed in the USFWS Umatilla County list of special status species, but there were no ORBIC records within 5 miles of the Project. Bull trout are not expected to be found in streams within the site boundary or the Project's leased lands.

2.1.2.2 Steelhead, Middle Columbia River (Summer Run)

Middle Columbia River steelhead is a federally threatened species; as an anadromous species, it falls under the jurisdiction of the National Marine Fisheries Service (NMFS) of the National Oceanic and Atmospheric Administration (NOAA). There were two ORBIC records of this species within 5 miles of the Project, but steelhead are not expected to be found in streams within the site boundary or the Project's leased lands.

2.1.3 Listed, Candidate, and Proposed Plants

2.1.3.1 Laurent's Milkvetch

Laurent's milkvetch is listed by the Oregon Department of Agriculture as a threatened species. The ORBIC database included two historical records within 5 miles of the Project, one within 5 miles of the Wheatridge West turbine group, one within 5 miles of the Wheatridge East turbine group, and no records within 5 miles of the Intraconnection Corridor.

2.1.3.2 Dwarf Suncup

Dwarf suncup is listed by the Oregon Department of Agriculture as a candidate species. Found on rocky slopes, sandy banks, and in dry, gravelly washes, this species' range may include the Project area. No records were found within 5 miles, however, in the ORBIC database.

2.1.3.3 Disappearing Monkeyflower

Disappearing monkeyflower is listed by the Oregon Department of Agriculture as a candidate species. Found in moist, heavy gravel that is inundated in early spring, this species' range may include the Project area. No records were found within 5 miles, however, in the ORBIC database.

2.1.3.4 Liverwort Monkeyflower

Liverwort monkeyflower is listed by the Oregon Department of Agriculture as a candidate species. Found in basalt crevices in seepage zones of vertical cliffs and canyon walls, this species' range may include the Project area. No records were found within 5 miles, however, in the ORBIC database.

2.1.3.5 Vernal Pool Mousetail

Vernal pool mousetail is listed by the Oregon Department of Agriculture as a candidate species. Found in moist areas associated with drying vernal pools and alkali flats, this species' range includes the Project area. No records were found within 5 miles, however, in the ORBIC database.

2.2 Field Surveys

2.2.1 Listed, Candidate, and Proposed Wildlife

2.2.1.1 Washington Ground Squirrel

The special status wildlife species survey was designed specifically to verify the presence or absence on the Project area of this state endangered species (though other special status species were also recorded, as described in Exhibit P). For each area of land studied, two surveys were conducted in a single year during the period of ground squirrel activity (March through June). Most areas were surveyed in 2011, but supplemental surveys were conducted in 2012 and 2013. A more complete description of survey methods can be found in Attachment P-1, the *Wheatridge Ecological Studies Report* (Gerhardt and Anderson 2014).

Special status vertebrate wildlife species surveys resulted in the detection of Washington ground squirrels on leased land associated with the Wheatridge West turbine group, the Wheatridge East turbine group, and the transmission Intraconnection Corridor.

2.2.2 Listed, Candidate, and Proposed Fish

No field studies were conducted for fish, since construction and operation of the Project will involve no temporary or permanent impacts to intermittent or perennial fish-bearing streams. Moreover, there is no historical evidence of the occurrence of any state or federal listed, candidate, or proposed fish species within the site boundary (ORBIC results, as described in Gerhardt and Anderson 2014).

2.2.3 Listed, Candidate, and Proposed Plants

Rare plant surveys were designed to verify the presence or absence on the Project area of Laurent's milkvetch and the four candidate species identified as having a possibility of occurrence. For each area of land studied, a single survey was conducted at a time deemed appropriate for detecting these species (mid-May to mid-June). Because Laurent's milkvetch can only be distinguished from some conspecifics based on fruit pods, additional visits were performed (in late June or July) to positively identify candidate individuals at the time of fruiting. Most areas were surveyed in 2011, but supplemental surveys were conducted in 2012 and 2013. A more complete description of survey methods—as well as a comprehensive list of plant species found during surveys—can be found in Attachment P-1, the *Wheatridge Ecological Studies Report* (Gerhardt and Anderson 2014).

2.2.3.1 Laurent's Milkvetch

Rare plant surveys resulted in the detection of Laurent's milkvetch on leased lands associated with the Wheatridge West and Wheatridge East turbine groups. This species was also detected on a proposed intraconnection route that was subsequently rejected; it was not detected on the area associated with the chosen Intraconnection Corridor.

2.2.3.2 Dwarf Suncup

No individuals of this species were detected.

2.2.3.3 Disappearing Monkeyflower

No individuals of this species were detected.

2.2.3.4 Liverwort Monkeyflower

No individuals of this species were detected.

2.2.3.5 Vernal Pool Mousetail

No individuals of this species were detected.

3.0 Occurrence and Potential Adverse Effects – OAR 345-021-0010(1)(q)(B)

3.1 Listed, Candidate, and Proposed Wildlife

3.1.1.1 Washington Ground Squirrel

Washington ground squirrel is associated with deep, loose soils in shrub-steppe habitats with a high percentage of grass and forb cover. A secretive species, it is generally active only between February and June, estivating and hibernating deep in burrows through the remainder of the year.

There were 124 recorded detections of Washington ground squirrel within special status vertebrate wildlife species survey corridors associated with the Project. These included 50 detections associated with the Wheatridge West turbine group, 55 detections associated with the Wheatridge East turbine group, and 19 detections along the transmission Intraconnection Corridor. These ranged from single holes with scat present to larger colonies at which ground squirrels were both seen and heard. Washington ground squirrels were detected in four habitat types, Basin Big Sagebrush Shrub-steppe, Rabbitbrush/Snakeweed Shrub-steppe, Exotic Annual Grassland, and Native Perennial Grassland. Maps of buffers established around all detections were submitted to ODFW and USFWS personnel in early October 2014. A more complete description of results can be found in Attachment P-1, the *Wheatridge Ecological Studies Report* (Gerhardt and Anderson 2014).

The most significant potential adverse effect would be direct mortality caused by Project construction activities in areas occupied by ground squirrels. Direct mortality is also possible from Project vehicles (maintenance and administrative) throughout the life of the Project. Indirect adverse effects include the loss of potential future suitable habitat (currently not occupied). Project roads are not deemed barriers to dispersal of this species; therefore habitat fragmentation is not expected to be an adverse effect.

3.2 Listed, Candidate, and Proposed Plants

3.2.1.1 Laurent's Milkvetch

Typical habitat of this species is basaltic grassland and sagebrush desert. Two populations of Laurent's milkvetch were detected, one within survey corridors associated with the Wheatridge West turbine group, and one within survey corridors associated with the Wheatridge East turbine group.

Potential adverse effects of facility development to this species would be direct mortality of plants during construction and loss of potential suitable habitat not currently occupied.

4.0 Avoidance and Minimization – OAR 345-021-0010(1)(q)(C)

4.1 General Measures

The applicant has implemented and will implement a variety of measures intended to ensure avoidance or minimization of adverse impacts to plants, wildlife, and habitat generally and to state and federally listed, candidate, or proposed species and their habitats in particular. Many of these measures are described in greater detail in Exhibit P, and many will be addressed in the Revegetation Plan, the Habitat Mitigation Plan, and the Wildlife Monitoring and Mitigation Plan (draft concepts for which are included as Attachments P-2, P-3, and P-4, respectively). This section identifies those avoidance and mitigation measures that apply to one or both of the two listed, candidate, or proposed species found in the vicinity of the Project, Washington ground squirrel and Laurent's milkvetch.

4.1.1 During Design and Micrositing

During design and micrositing of the Project, avoidance of listed, candidate, or proposed species of plants and wildlife was ensured by surveying for these species and siting Project facilities outside of locations where these species were found and outside of Category 1 habitat associated with these species.

The Project was also designed and microsited so that to the greatest extent possible, Project facilities were sited in developed habitats—especially Dryland Wheat—rather than in native and other habitats that could support these listed species in the future.

To the greatest extent possible, Project roads will utilize (and, in some cases, improve) existing roads to reduce the amount of habitat loss associated with the Project.

Prior to construction, maps will be provided to ODOE showing final Project design; no facilities will be constructed within populations of Laurent's milkvetch, within populations of Washington ground squirrel, or within Category 1 habitat associated with Washington ground squirrel populations.

4.1.2 During Construction

Several measures for avoiding and minimizing impacts to wildlife and plants—including listed species—will be implemented during Project construction.

Construction monitoring will be conducted by a qualified biologist. This monitoring will include spring surveys to ensure that Washington ground squirrels have not expanded from identified areas of use into areas where facilities are to be constructed. Monitoring will also include environmental training for all construction and Project personnel, exclusion flagging and temporary fencing as appropriate to identify Category 1 and other important habitats where no construction activities will be allowed, and oversight of permit compliance during construction.

As appropriate, dust abatement will be applied to gravel roads used during construction to minimize deposition of dust on Project vegetation.

Speed limits will be in force for all construction and other Project personnel throughout the construction period. These speed limits will be implemented for the purpose (among others) of minimizing the possibility of injury or death of wildlife generally and of Washington ground squirrel in particular.

Prior to construction, the Applicant will be expected to have a fire control plan in place and approved by Morrow and Umatilla Counties.

4.1.3 Post-Construction

After Project construction, areas where habitat was temporarily disturbed as a result of construction activities will be restored to their original conditions according to provisions in the Revegetation Plan (draft concepts for which are included as Attachment P-2.)

Both temporary habitat disturbance associated with construction activities and permanent habitat loss will be mitigated for according to provisions of the Habitat Mitigation Plan (draft concepts for which are included as Attachment P-3).

A Wildlife Monitoring and Mitigation Plan (for which draft concepts are included as Attachment P-4) will be implemented. Components of this plan will include ongoing environmental training for Project personnel and reporting requirements governing incidental wildlife injuries and deaths on Project roads.

Speed limits that will minimize the likelihood of death or injury of wildlife generally and of Washington ground squirrel in particular are expected to be implemented throughout the life of the Project.

An approved fire control plan will be implemented throughout the life of the Project; this is expected to minimize undesired impacts to existing vegetation and wildlife habitats, including habitat for Washington ground squirrel and Laurent's milkvetch.

4.2 Listed, Candidate, and Proposed Wildlife

4.2.1 Washington Ground Squirrel

Design of the Project and siting of all Project facilities were done only after results of surveys for Washington ground squirrel were completed. For each detection of this species, an area of Category 1 habitat was designated, extending 785 feet in suitable habitat beyond the area of documented ground squirrel use. No Project facilities were sited in this Category 1 habitat, a standard practice meant to avoid not only existing squirrels and their burrows but also potential suitable habitat into which squirrels may later disperse.

Additional surveys for Washington ground squirrels will be conducted in the spring prior to construction of the Project to ensure that identified areas of use have not been expanded to areas where facilities are to be constructed.

Minimization of death or injury to this species from interaction with Project vehicles will involve speed limits on Project roads and environmental education for personnel working on the Project.

Potentially suitable—but currently unoccupied—habitat that will be temporarily disturbed during Project construction will be restored to its original condition according to provisions in the Revegetation Plan (for which draft concepts are included as Attachment P-2), and such temporary disturbance will be mitigated for according to provisions in the Habitat Mitigation Plan (for which draft concepts are included as Attachment P-3).

Potentially suitable—but currently unoccupied—habitat that is permanently lost through the placement of Project facilities will be mitigated for according to provisions in the Habitat Mitigation Plan (for which draft concepts are included as Attachment P-3).

4.3 Listed, Candidate, and Proposed Plants

4.3.1 Laurent's Milkvetch

Design of the Project and siting of all Project facilities were done only after results of surveys for Laurent's milkvetch were completed. No Project facilities were sited in locations where this species was found to occur.

Potentially suitable—but currently unoccupied—habitat that will be temporarily disturbed during Project construction will be restored to its original condition according to provisions in the Revegetation Plan (for which draft concepts are included as Attachment P-2), and such temporary disturbance will be mitigated for according to provisions in the Habitat Mitigation Plan (for which draft concepts are included as Attachment P-3).

Potentially suitable—but currently unoccupied—habitat that is permanently lost through the placement of Project facilities will be mitigated for according to provisions in the Habitat Mitigation Plan (for which draft concepts are included as Attachment P-3).

5.0 Protection and Conservation Program Compliance/Impacts – OAR 345-021-0010(1)(q)(D)

The ODA establishes Protection and Conservation Programs for selected locations and selected plant species listed as threatened or endangered under the Oregon Endangered Species Act. Because no such programs apply to the site of this Project, no additional information is required under this provision (D), and OAR 345-022-0070(1)(a) is not applicable.

6.0 Potential Impacts to Plants, Including Mitigation Measures – OAR 345-021-0010(1)(q)(E)

The ODA has no Plant Protection and Conservation Program associated with the Project site. Laurent's milkvetch was the only threatened, endangered, or candidate species encountered on the Project. Construction, operation, and maintenance of the Project are not expected to result in a significant reduction in the likelihood of survival or recovery of the state candidate plants dwarf suncup, disappearing monkeyflower, liverwort monkeyflower, or vernal pool mousetail.

6.1 Laurent's Milkvetch

Two small populations of Laurent's milkvetch were encountered during plant surveys. Project siting was done to avoid these locations, and no direct impacts are expected from construction, operation, and maintenance of the Project. Loss of potential suitable habitat—not currently occupied—will be mitigated through provisions of the Habitat Mitigation Plan (for which draft concepts are included as Attachment P-3). Construction, operation, and maintenance of the Project are not expected to result in a significant reduction in the likelihood of survival or recovery of Laurent's milkvetch.

7.0 Potential Impacts to Animals, Including Mitigation Measures – OAR 345-021-0010(1)(q)(F)

7.1 Listed, Candidate, and Proposed Wildlife

Washington ground squirrel is the only threatened, endangered, or candidate terrestrial vertebrate species found or expected to be found in the area of the Project. Construction, operation, and maintenance of the Wheatridge Wind Energy Facility are expected to entail no significant reduction in the likelihood of survival or recovery of any other state or federal listed, candidate, or proposed species of terrestrial vertebrate wildlife.

7.1.1 Washington Ground Squirrel

Avoidance of impacts to Washington ground squirrels and their colonies was accomplished through identifying and buffering areas of use and siting Project facilities outside of those buffers. Minimization of possible death or injury from interaction with Project vehicles will be accomplished through speed limits and environmental training of all Project personnel. Mitigation for loss of potentially suitable—but presently unoccupied—Washington ground squirrel habitat will be accomplished through provisions in the Habitat Mitigation Plan (for which draft concepts are included as Attachment P-3).

Construction, operation, and maintenance of the Wheatridge Wind Energy Facility are not expected to result in a significant reduction in the likelihood of survival or recovery of Washington ground squirrel.

7.2 Listed, Candidate, and Proposed Fish

No threatened, endangered, or candidate fish species are found in streams within the Project's site boundary. Construction, operation, and maintenance of the Wheatridge Wind Energy Facility are expected to entail no adverse impacts to state or federal listed, candidate, or proposed fish species. No mitigation measures are planned or required.

8.0 Monitoring – OAR 345-021-0010(1)(q)(G)

The Wildlife Monitoring and Mitigation Plan (for which draft concepts are included as Attachment P-4) will delineate the studies, analyses, and reporting requirements associated with monitoring of the Wheatridge Wind Energy Facility. Because potential adverse impacts to listed, candidate, and proposed species have been avoided through Project siting and mitigated through provisions in the Habitat Mitigation Plan (for which draft concepts are included as Attachment P-3), there is no monitoring anticipated that is specific to listed, candidate, or proposed species of wildlife, fish, or plants.

9.0 References

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Figures

Figure Q-1. Threatened and endangered species analysis area for the Wheatridge Wind Energy Facility, Morrow and Umatilla Counties, Oregon.

Figure Q-1

Wheatridge Wind Energy Facility

Threatened and Endangered Species Analysis Area

Morrow and Umatilla Counties, OR
December 2014

Wheatridge West
Wheatridge East
Intraconnection Corridor
Stanfield
Echo
Ione
Lexington
Heppner
Morrow County
Umatilla County
207
84
74
395

- Site Boundary
- Analysis Area (5 mile Buffer of Site Boundary)
- County Boundary
- City/Town
- Interstate Highway
- Federal Highway
- State Highway

1:225,000 WGS84 UTM 11

0 1 2 4 6 8 10 12 14 16 18 20 Miles

Data Sources Wheatridge Wind Energy: project facilities / ESRI: roads, political boundaries / USDA NAIP: background imagery

TETRA TECH

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