ORION ENERGY

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ORION ENERGY LLC
1611 Telegraph Ave, Suite 1515
Oakland, CA 94612
tel: 510-267-8988
fax: 510-267-0325

March 13, 2006

Catherine Van Horn
Oregon Department of Energy
625 Marion St. NE
Salem, OR 97301-3737

Subject: Application for a Site Certificate for the Biglow Canyon Wind Farm Facility

Dear Cathy:

Orion Sherman County Wind Farm, LLC (Orion) is pleased to submit to the Oregon Department of Energy (ODOE) and the Oregon Energy Facility Siting Council (EFSC), this Supplemental Application for a Site Certificate (Supplemental ASC) for the Biglow Canyon Wind Farm Facility (Facility). In submitting this Supplemental ASC, Orion is excited to take an important step toward helping Oregon fulfill its preference for renewable energy as cited in the State's Energy Policy in ORS 469.010.

The proposed Facility will be located on private land in an unincorporated area of Sherman County. It will consist of up to 225 wind turbines with an aggregate nominal nameplate generating capacity of up to 450 megawatts (MW) of electricity. The Facility will be powered by wind, a clean, renewable resource. No carbon, sulfur, nitrogen, or mercury air emissions will be produced as a result of this Facility. The Facility will not consume water resources in the generation of electricity, nor will it produce waste heat or significant quantities of solid waste.

In closing, we would like to thank ODOE for its assistance in reviewing this Supplemental ASC and developing the Proposed Order. We are proud to be a part of Oregon's renewable energy future. Please contact us at any time if you have any questions regarding this application.

Sincerely,

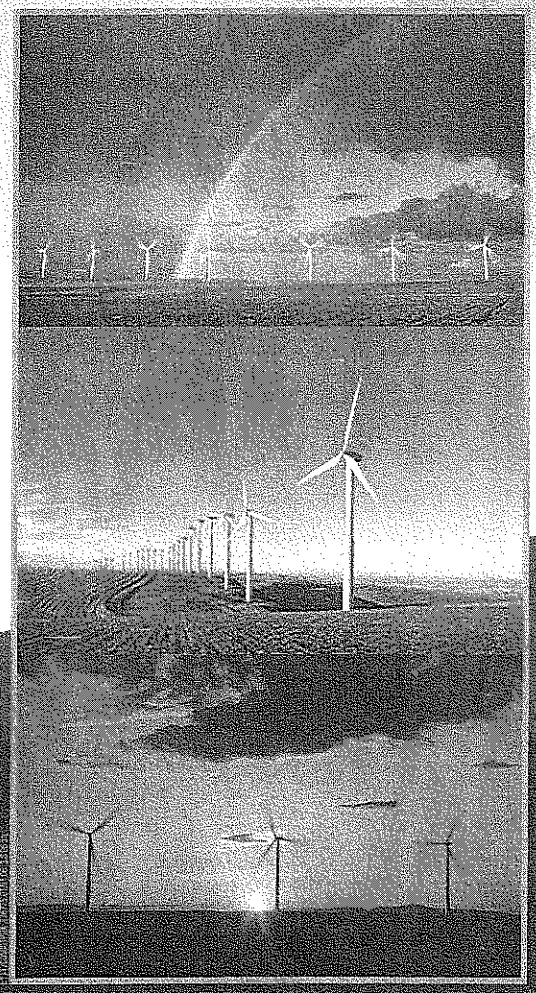
Carlos V. Pineda

BCWAPPDoc45

Supplement to the Site Certificate Application for the

Biglow Canyon Wind Farm

Sherman County, Oregon



Submitted to the
Oregon Energy Facility Siting Council

Orion Energy LLC

ORION ENERGY LLC

CH2MHILL

WEST, Inc.

March 2006

Supplement to the Site Certificate Application for the Biglow Canyon Wind Farm

Sherman County, Oregon

Prepared for

Oregon Energy Facility Siting Council

March 2006

Prepared by

Orion Energy LLC

CH2M HILL

West, Inc.

Printed on Recycled and Recyclable Paper

Contents

Attachments

Appendix

Introduction

This Supplement to the Site Certificate Application for the Biglow Canyon Wind Farm (Supplement) collects in one document all responses submitted to the Oregon Department of Energy (ODOE or Department) by Orion Sherman County Wind Farm, LLC (Orion or Applicant) in response to requests for additional information (RAIs) made by ODOE and other agencies regarding Orion's original application (ASC). On the basis of the original ASC, as supplemented by the Applicant's responses to RAIs, ODOE determined on February 24, 2006, that the ASC was complete and deemed it to be filed under the procedural rules of the Energy Facility Siting Council (Council). In this Supplement, each RAI is reproduced under the heading "Comment" and each Applicant response is reproduced under the heading "Response."

The Supplement also describes and analyzes a number of minor modifications to the layout, location, and size of various components of the proposed Biglow Canyon Wind Farm (Facility). These modifications were developed by the Applicant after submitting the original ASC, and are intended to optimize the Facility design and layout in response to various factors, including engineering refinements, increasingly detailed knowledge of site-specific conditions, and landowner requests. The engineering refinements include adoption of alignment options "A" and "B" for each of the two originally proposed transmission line alternatives "1" and "2," which reduce the net impact on higher-value habitat; slight increases in the road width at intersections of Facility roads with county roads; a minor relocation of the substation associated with transmission line Alternative #1 to a nearby location also on cultivated fields; and addition of underground collector lines in certain portions of the Facility. All of these refinements are described in Exhibit C in this Supplement under the heading "Additional Information," and they are shown collectively on Figure C-2A of the Supplement. Individual refinements are analyzed as necessary under the "Additional Information" heading in other Exhibits of the Supplement.

Taken together, the Facility modifications developed in response to ODOE RAIs and on the Applicant's own initiative account for a net total increase of approximately 12 acres of temporary impacts (from 381 acres to 393 acres) and an increase in permanent impacts of 7 acres (from approximately 170 to 177 acres). The additional impacts will be limited to a total of 0.28 acre in categories three and four, Conservation Reserve Program (CRP) and shrub-steppe habitat, respectively. As presented in various Exhibits of the Supplement, the Applicant has analyzed the effect of each modification under all applicable Council standards and has concluded that the changes do not impact the findings of compliance with Council standards presented in the original ASC.

EXHIBIT A

Applicant Information

This exhibit has not changed.

EXHIBIT B

General Information about the Proposed Facility

Comment

(Exhibit B, Section B.1.6, page B-4) Underground cables will comprise the bulk of the power collection system. To span canyons, native grasslands, wetlands, intermittent streams, and cultivated areas, Orion proposes to install some collector cables above ground on poles or towers 23 to 28 feet tall. The ASC should be revised as possible to define the areas in which the collector cables would be installed above ground, the length of these overhead sections, the number of poles or towers required, and the dimensions of the poles or towers.

Response

Orion will not know which collector lines, if any, will be above ground until it has prepared its final layout and made final decisions regarding substation location. Orion may place collector lines overhead for limited distances in order to avoid disturbances to native habitat, jurisdictional waters, or steep terrain. Orion may also place overhead lines to maximize collection efficiency of the system. It is not expected, in any case, that overhead collector lines will exceed more than 15 miles, or less than 12 percent of the total collector line length, which is estimated to be approximately 133 miles (700,000 feet) total.

Comment

The Energy Facility Siting Council considers collector lines to be "transmission lines." Accordingly, please provide the information described in OAR 345-021-0010(1)(b)(E) for the underground and aboveground segments of the proposed collection system.

Response

Orion respectfully suggests that collector lines (34.5 kilovolt [kV]) are not transmission lines, as transmission lines are generally considered to be rated at 60 kV and higher[1]. However, the requested information is provided below in order to facilitate Council review.

Page B-4 of the ASC provides information pertinent to OAR 345-021-0010(1)(b)(E), including the length of collector lines. All collector lines will run through private property as authorized by wind easement agreements with Orion landowners. There is no right-of-way (ROW), as that term is generally used, associated with these collector lines. Where collector lines cross public ROW, crossing agreements will be obtained as required.

The typical overhead 34.5-kV lines will be on single wood poles. Conductor height from grade will be 23 to 28 feet minimum, and pole heights will be designed as necessary to

[1] Miller, R. and J.H. Malinowski (1994). Power System Operation. McGraw Hill, 3rd Edition.

maintain minimum ground clearance. Pole-top assemblies may support up to three circuits (nine conductors) and communication cables.

Comment

(Exhibit B, Section B.15, page B-15) Orion suggests that the energy facility might be built in phases and proposes that construction of the first phase of the facility should begin within 2 years of issuance of the site certificate, and construction of the last phase of the facility should begin within 5 years of the site certificate. Historically, the Council has required that construction of the facility begin within 2 years after approval of the site certificate and be completed within 5 years after approval of the site certificate, in part to ensure that site certificate conditions remain current in relationship to applicable rules and statutes. If Orion does propose to build the facility in phases, it should describe what would constitute a phase and how many phases would be proposed. Orion should also present its most compelling argument for any deviation from the Council's historic practice of limiting the time for commencement and completion of construction.

Response

Orion requests the flexibility to construct the Facility in phases. Orion also requests that construction be allowed to begin at any time within three [3] years of the issuance of the Site Certificate, with construction of all phases to be complete within seven [7] years of the issuance of the Site Certificate.

The Facility will interconnect to the grid and transmit power via a new Bonneville Power Administration (BPA) transmission line and interconnection facilities. BPA still must locate the exact transmission line route, negotiate land agreements, prepare baseline studies, publish a draft EIS, respond to comments, complete a final EIS, procure materials, bid out construction contracts as necessary, and construct the line and interconnection facilities. Given that Orion has little control over this process, Orion requests three years to begin construction of the Facility.

Orion also requests 2 years more than the Council standard (5 years) in which to finish construction of all phases. The Facility is a large wind energy project, and must be built in phases in order to stay in step with the market demand for wind power. Because Orion intends to develop each phase of the Facility in response to market demand at the time, it cannot specify in advance the size or location of a particular phase.

Orion understands and appreciates the Council's desire to have site certificates remain current with respect to applicable law. However, the Facility has agreed to post-construction monitoring, and if results show that avian or other environmental impacts are greater than was anticipated, then additional mitigation will be provided pursuant to the Wildlife Monitoring and Mitigation Plan. Furthermore, the modular nature of wind projects makes them inherently better suited to respond over time to finer gradations in market demand (building one-third of a 450-MW combined cycle gas-fired power plant is not feasible, but Orion can build one-third of the proposed Facility and then build subsequent phases in response to market demand). The Council should strive to support, or at least not penalize, this beneficial feature.

Additional Information

Revised Figure B-3 shows minor modifications to the Facility's turbine corridors, collector lines, and transmission alternatives. The modifications shown in revised Figure B-3 represent a temporary disturbance area of 393.25 acres. The minor modifications to the collector line layout increase the amount of temporary disturbance area by 12.32 acres over the 381-acre area shown in ASC Figure B-3. (See the "Additional Information" subsection in Exhibit C of this Supplemental ASC for a complete review of these changes.)

In addition to the minor modifications to the collector line layout, there will be a slight increase in the permanent disturbance at the Facility site. This increase can be attributed to a widening of the intersections from county roads to turbine access roads. These intersections will result in a slight increase in the total permanent disturbance at the Facility site by 7 acres. By far, the majority of the increase in permanent disturbance will occur on agricultural or developed land.

The above-referenced modifications represent a slight increase over the "maximum impacts" described in the ASC on page B-3. Please see the "Additional Information" subsections of the appropriate Supplemental ASC exhibits for discussion of additional impacts (if any) by resource.

ATTACHMENT B-1

Revised Figure B-3

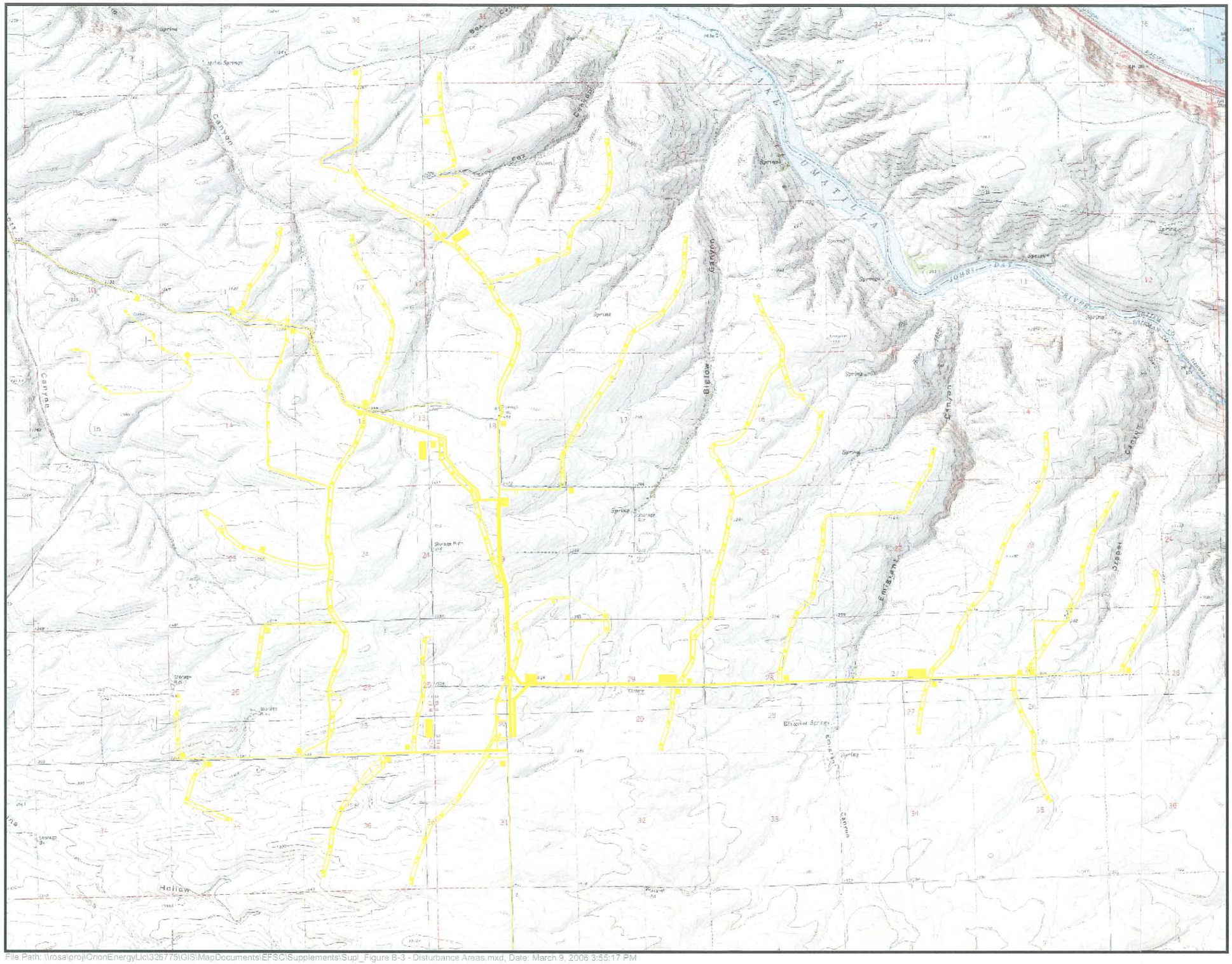


Figure B-3
Disturbance Areas

Biglow Canyon Wind Farm
Supplement

ORION ENERGY LLC

Legend

Temporary Disturbance Area
(~390 acres)

*Note: Figure B-3 shows the maximum amount of disturbed area anticipated for the Facility for the layout alternatives described in Exhibit B.

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EXHIBIT C

Proposed Location and Maps

Comment

(Exhibit C, Section C.1, page C-1) Provide full-size USGS 7.5-minute quadrangle maps showing the proposed locations of the energy facility site, and all related or supporting facility sites, in relation to major roads, water bodies, cities and towns, important landmarks and topographic features.

Response

Four copies of Figure C-2 on a full-size U.S. Geological Survey (USGS) 7.5-minute quadrangle map have been submitted by CH2M HILL under separate cover to the Oregon Department of Energy (the Department or ODOE). An 11x17 version of revised Figure C-2 is included in Supplemental ASC, Attachment C-1 (please see the Additional Information subsection below for a description of Figure C-2 revisions).

Comment

(Exhibit C, Section C.3, page C-1) Orion has provided GPS coordinates for its proposed corridor areas. For other facility components, including related or supporting facilities, please describe in text (as opposed to map form) the proposed site of each, including the land area of each. For access roads and transmission lines, define the centerline and the width and area of the road or corridor. If GPS coordinates are used to define the location of energy facility or related or supporting facility sites, provide cross-reference to key coordinates on the USGS 7.5-minute quadrangle maps.

Response

All Facility components have been described in the text of Exhibit B, and corresponding land areas described in Table C-1. Almost all access roads are located within the turbine corridors, except for certain limited locations where terrain requires that roads "swing" outside of the turbine corridors. Table C-2 below provides GPS coordinates of the three O&M Facility options and two substation options.

Supplement Table C-2. GPS Coordinates of Biglow Canyon Facilities

Facility	Northing*	Easting*
O&M Facility Option 1	5055493	686547
Substation Alternative 1/O&M Facility Option 2	5054763	686152
Substation Alternative 2/O&M Facility Option 3	5057798	686089

*All coordinates listed exist in the NAD 83, UTM, Zone 10 North coordinate system.
*Coordinates are "centroids," or center of the Facility polygon.

Additional Information

The following revisions have been made to the facilities layout in Figure C-2 (attached) and are highlighted in Figure C-2A (attached):

- Removal of a small piece of the turbine corridor located in the northwestern portion of the Facility area. Approximately 0.4 mile of the western half of the corridor will be removed. This modification reduces permanent disturbance areas and habitat impacts.
- Relocation of the substation option in Transmission Alternative 2 to a location approximately 0.5 mile southeast of its original location. The new substation location will be of the same size as the former location, and entirely on agricultural land. Therefore, no changes in temporary or permanent disturbance areas or habitat impacts will occur.
- Transmission Alternative 1 will include options "A" and "B," as shown in Figure C-2A.
  - Option A. This is the originally proposed Transmission Alternative 1 (ASC, page C-2).
  - Option B. This option is the same as Option A, except that it follows existing roads to interconnect at or near the Klondike Schoolhouse substation, rather than cutting diagonally across a cultivated area. This option follows the same route as the BPA line.
- Transmission Alternative 2 will include options "A" and "B," as shown in Figure C-2A.
  - Option A. This is the originally proposed Transmission Alternative 2 (see ASC, page C-2), with the exception that the substation location has changed as described in the second bullet above
  - Option B. This option follows the same route as the BPA line, traveling in straight lines (rather than following Herin Lane, as does Option A) from the new facility substation to the John Day Substation.
- These new transmission options have total disturbance impacts that are less than the maximum impacts calculated in Table C-1, as options "A" are essentially the same as those originally proposed, and options "B" are shorter or avoid to a greater degree impacts on native habitats. (See Exhibit P in this Supplemental ASC for a complete discussion of habitat surveys and impacts, with revised maps.) As stated in the original ASC, the Applicant may build any, or none, of these transmission line options.
- Addition of three new relatively minor collector line segments as highlighted in Figure C-2A to increase the efficiency of the collection system. These collector line additions are entirely on cultivated and developed land.
- Addition of a turbine corridor on cultivated land in the southern portion of the Facility area (the Alternate Turbine Corridor), which branches off and continues south from a longer turbine corridor that runs southeast. The Alternate Turbine Corridor may be established to avoid adverse "wake effects" on the nearby Oregon Trail Wind Farm (OTWF) community wind project. If the Applicant opts for the Alternate Turbine Corridor, the longer turbine corridor will not be built, thus reducing both temporary and

permanent disturbance areas. The Alternate Turbine Corridor and the original turbine corridor or both are entirely on agricultural land and thus the change yields no difference in habitat impacts.

- Widening of intersections between county roads and turbine access roads. The driveways between the turbine access roads and the county roads will be permanently widened by approximately combined 7 acres for the entire site to accommodate turbine and tower deliver vehicles and heavy equipment during the Facility construction and operational periods. Note that of the 7 acres of permanent impact, only 0.28 acre (or 4 percent) is on Category 3 and 4 habitat, while the remaining acres are all on agricultural or developed lands.

Figure C-2A is provided to simplify and assist in the review of the aforementioned modifications. The modifications in Figure C-2A represent a new, total temporary disturbance area of 393.25 acres (see Revised Table C-1, below). This number represents an increase of 12.32 acres over the 381-acre area shown in ASC Figure C-2, and a slight increase of 7 acres in the total permanent disturbance at the Facility site. The majority of the increase in permanent disturbance will occur on agricultural or developed land (see Revised Table P-8 in Exhibit P of this Supplemental ASC).

The above-referenced modifications represent a slight increase over the "maximum impacts" addressed on page B-3 of the ASC. Please see the "Additional Information" subsections of the appropriate Supplemental ASC exhibits for discussion of additional impacts (if any) by resource.

Revised Table C-1 Estimated and Approximate Area of the Energy Facility and all Related or Supporting Facilities[1]

Facilities	Units of Measurement	Approx. Unit Area	Approx. No. of Units	Approx. Total Area in Acres
Permanent Facilities				
Turbine Pads/Towers	Square feet per tower	2,786	225	14.39
Substation/Alternative Substation	Acres	6	1	6
Meteorological towers	Square feet	900	9	0.19
O&M Facility (building)	Square feet	5,000	1	0.11
O&M Facility Site	Acres	5	1	5
Access roads, new	Square feet disturbed area per linear foot of road	28	213,795	137.43
Access roads, improved	Square feet disturbed area per linear foot of road	18	3,617	1.49
Access road intersections	Square feet	7,822	39	7.00
Turnaround Areas	Square feet	7,854	29	5.23
Previous Total Permanent Facilities				**169.84**
Revised Total Permanent Facilities				**176.84**
Temporary Facilities				
Access roads, construction	Square feet disturbed area per linear foot of road	7	217,412	34.94
Access road to Meteorological Tower	Square feet disturbed area per linear foot of road	8	7,335	1.35
Meteorological Tower[2]	Square feet	5,000	9	1.03
Laydown areas at each string	Acres per area	1	30	30
Laydown areas at each tower site	Square feet per laydown area	18,500	225	95.56
Additional laydown areas	Acres per area	5	6	30
Temporary access for overhead line construction[3]	Square feet disturbed area per linear foot of road	12	36,960	10.18
Previous underground collector cable disturbed area	Square feet of disturbed area per linear foot of trench	20[4]	7,748,256	177.88
Revised underground collector cable disturbed area	Square feet of disturbed area per linear foot of trench	20[4]	8,288,630	190.20
Previous Total Temporary Facilities				**380.93**
Revised Total Temporary Facilities				**393.25**

[1] Overhead collector line poles and associated laydown areas total less than 5 acres.

[2] Meteorological tower impact does not include estimated guy wire area; the footprint of the base is approximately 30 feet by 30 feet.

[3] Either approximately 3 or approximately 7 miles long.

[4] Disturbance from underground electric collection system is based on 20 square feet per lineal foot of trench for first circuit, plus 12 square feet per lineal foot of trench for each additional paralleling circuit.

ATTACHMENT C-1

Revised Figure C-2 and New Figure C-2A

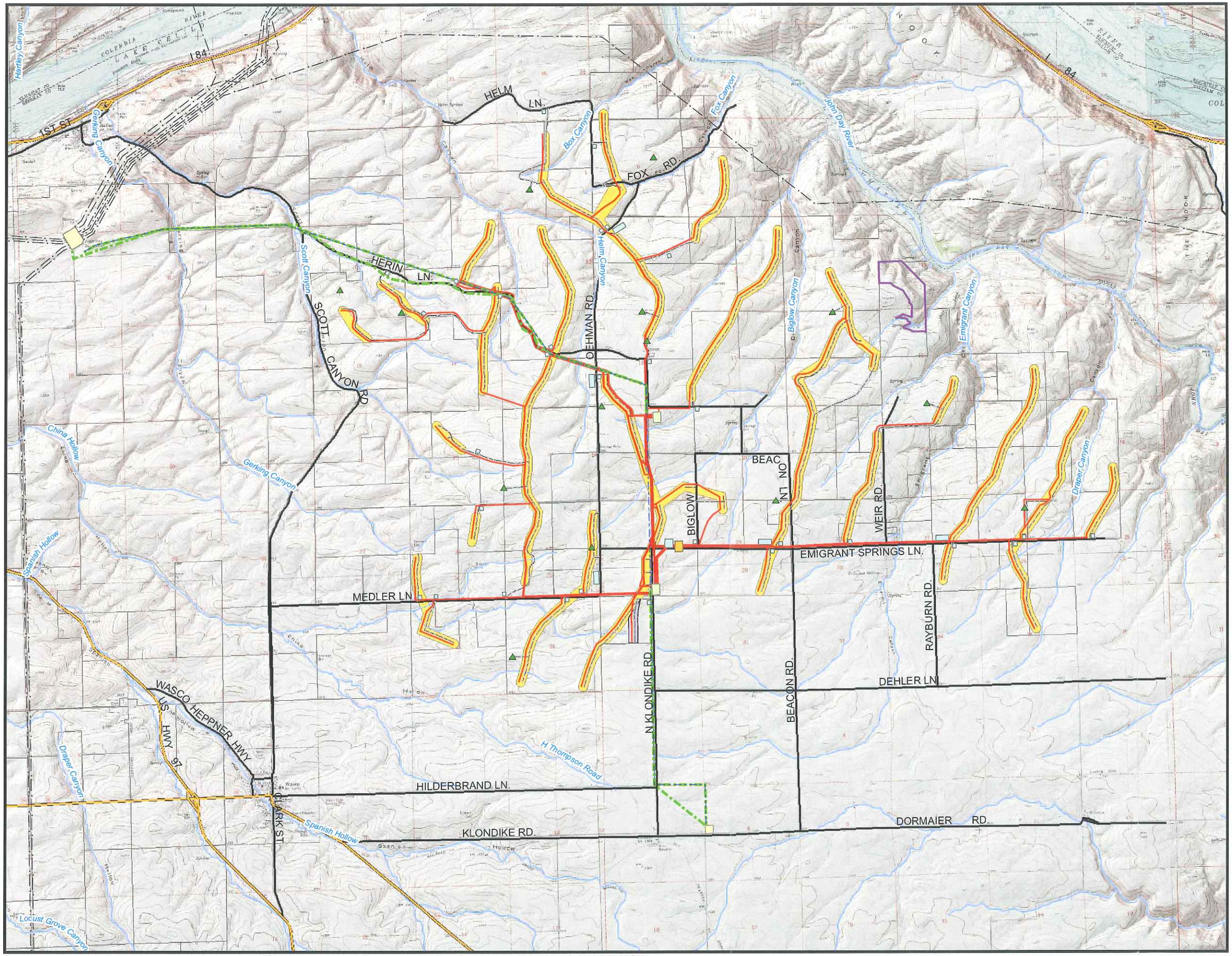

Figure C-2
Wind Farm Facilities

Biglow Canyon Wind Farm Supplement

ORION ENERGY LLC

Legend

- Proposed Met Tower
- Proposed Turbine Corridors
- Alternate Corridor
- Proposed Facility Access Roads
- Existing Roads
- Existing Highways
- Proposed 34.5-kV Collector System
- BPA Proposed Transmission Line
- Orion Proposed Transmission Line
- Existing Transmission Line
- Proposed Staging Areas
- Existing Substation
- Proposed Substation / Proposed O&M Facility
- Proposed O&M Facility
- John Day Rim Mitigation Area
- Streams

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Source:
Map created using the following USGS, 7.5-Minute Quad Maps: Klondike (1971), Quinton (1976), Rufus (1971), and Wasco (1987)

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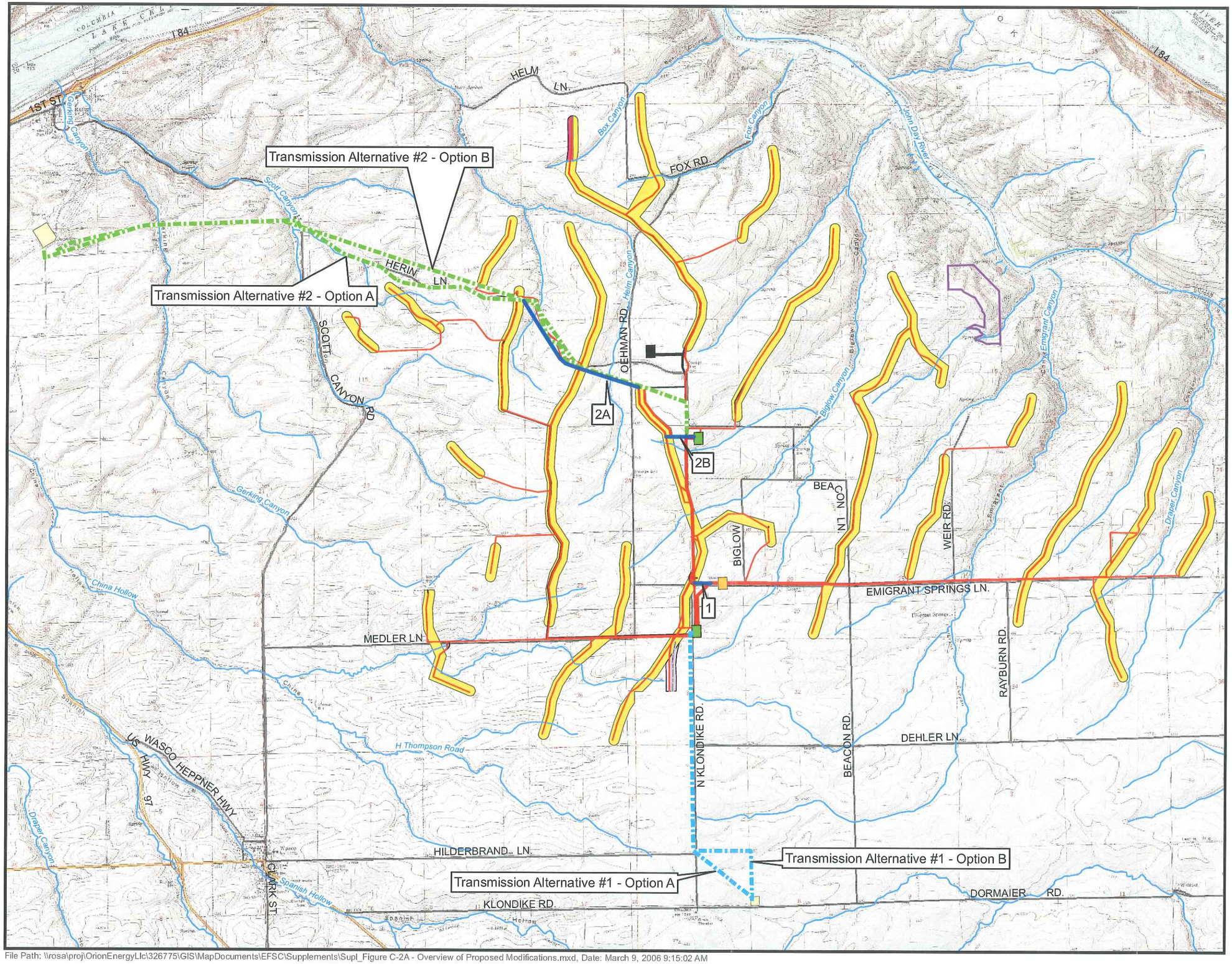
Figure C-2A
Overview of Proposed Modifications
Biglow Canyon Wind Farm Supplement

ORION ENERGY LLC



Legend

Modified Features
- Transmission Alternative 1
- Transmission Alternative 2
- Collector System Line Segment Additions
- Revised Proposed Substation / Proposed O&M Facility
- John Day Rim Mitigation Area
- Removed Portion of Turbine Corridor
- Alternate Corridor
- Alternate Corridor Access Road

Proposed / Existing Features
- Revised Proposed 34.5-kV Collector System
- Proposed Turbine Corridors
- O&M Facility
- BPA Substation

Features Removed From Site Certificate Application
- Initial Proposed 34.5-kV Collector System
- Initial Proposed Substation / Proposed O&M Facility

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Map created using the following USGS, 7.5-Minute Quad Maps: Klondike (1971), Quinton (1976), Rufus (1971), and Wasco (1987)

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EXHIBIT D

Organizational, Managerial, and Technical Expertise

This exhibit has not changed.

EXHIBIT E

Permits Needed for Construction and Operation

Comment

The Department has received from Orion an NPDES permit application and a Joint Corps/ DSL permit application. The Department has received notice from DEQ that the NPDES permit application is complete for its purposes. The Department has received notice from DSL that the Joint Corps/DSL application is incomplete.

(Exhibit E, Sections E.4 and E.5, page E-7) In accordance with OAR 345-021-000(5), provide to the Department 3 copies of any other application or revised application for a state or local government agency permit for which the Council must determine compliance with applicable standards and 3 copies of each applicable federally-delegated permit application.

Response

The NPDES 1200-C permit for the Facility has been issued by DEQ. A copy was provided to the Department on February 24, 2006.

On January 18, 2006, Kevin Herkamp of DSL conducted a site visit to determine if stream or drainage crossings 1, 2, 3, 4, 5, 6, 7, and 8 are "waters of the state." "Waters of the state" as defined in OAR 141-085-0015(2) are "rivers, intermittent and perennial streams, lakes, ponds and all other bodies of the water (except wetlands)..."

During that visit and in the subsequent letter dated February 3, 2006, DSL determined that none of the above-mentioned intermittent stream or agricultural drainage crossings, except crossing 7, meets the definition of "intermittent stream" as defined in OAR 141-085-0005(111)[2]. DSL also determined that the Applicant will not need to submit a Joint Permit Application (JPA) to DSL for this project. Crossing 7 meets the above-referenced definition of an intermittent stream, but impacts are avoided at this crossing.

Comment

Please confirm whether Orion will need to use water to wash turbine blades as is described in Exhibit O, page O-2, footnote 1. If wash water will be used, Orion must consult with DEQ about the need for a general WPCF permit.

Response

Orion has filed Wastewater General Permit 1700 with DEQ for blade washing activities at the Biglow Canyon Wind Farm. Orion will provide the Department with a copy of the permit once it is issued by DEQ.

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[2] See Attachment J-1, letter from Eric D. Metz, DSL, February 3, 2006.

EXHIBIT H

Geological and Soil Stability

Comment

The council considers collector lines to be "transmission lines." Accordingly, please provide the information described in OAR 345-021-0010(1)(h)(C) for the underground and aboveground segments of the proposed collection system.

Response

Orion will provide specific details of where geotechnical exploration activities will be performed at the site once it has submitted its final layout. In general, Orion will excavate test pits along "home-run" portions of the 34.5-kV collector circuits (areas where more than one circuit is carried in along the collection system), and conduct laboratory testing of soil and rock samples in these areas. Also, because most of the 34.5-kV collector lines will be located within the turbine corridors (and adjacent to turbine foundations), most of the data collected from drilling and other geotechnical activities at each of the individual turbine sites will also apply to these lines.

Comment

On page H-12, instead of an estimated site class profile (in the ASC, SB is quoted as the estimated site class) for the entire site, once the proposed site-specific geotechnical investigation is completed, the seismic hazard assessment should integrate any new pertinent information and revisions made. Furthermore, the site-specific profile should be extended to the site boundaries in order to find the potential range of conditions across the site.

Response

Comment noted. The Applicant will integrate pertinent information and revise the seismic hazard assessment if necessary. The data collected during the Facility's geotechnical investigation will provide information regarding the site-specific profile to identify the potential range of conditions across the site.

Comment

On page H-13, it states that the basalt rock present over most of the site is generally competent and free of existing landslides. Since the proposed site is adjacent to the slopes down to the John Day River and its tributaries such as Biglow Canyon, and in some cases crosses these tributary canyons, we recommend performing a detailed existing and proposed slope stability evaluation of the site and any adjacent slopes. Furthermore, the slope stability evaluation should include the evaluation of the surficial loess soils, which as stated in the ASC may be up to 40 feet thick.

Response

No significant potential geological or soil stability hazards were identified at the Facility site. However, if the geotechnical investigation indicates the potential for existing landslides or marginally stable slopes that could be made unstable by the planned construction, a detailed slope stability evaluation will be performed at those locations.

(*See ASC, Page H-15.*) In addressing issues regarding slope stability, it should be noted that the Applicant does not intend to construct the Facility near steep or potentially unstable slopes.

Comment

On page H-3, it states that a site specific geotechnical investigation will be completed prior to construction. DOGAMI should be provided with the results of this future investigation and reserves the right to comment on the results with respect to public safety issues pertaining to potential site geologic hazards. Once the site-specific geotechnical investigation is completed, then the seismic hazard assessment should integrate any new pertinent information and revisions made.

Response

Comment noted. The Applicant will provide DOGAMI with a copy of the Geotechnical Data Report and revised seismic hazard assessment (if revisions are necessary).

Comment

As stated in our NOI review letter, we encourage the geotechnical consultant to use the Oregon Board of Geologists Examiners developed flexible framework of guidelines titled: Guidelines for Engineering Geology Reports and Site-Specific Seismic Hazard Report for copies are available from the Oregon Department of Geology and Mineral Industries for general reference as Open File Report 00-00-4. It is the responsibility of the applicant to ensure that those preparing geologic hazard, geotechnical, and seismic hazard reports in the state of Oregon meet all appropriate requirements.

Response

Comment noted. The geologic hazard, geotechnical, and seismic hazard reports will be prepared in accordance with the Oregon Board of Geologists Examiners Guidelines for Engineering Geology Reports and Site-Specific Seismic Hazard Report.

Additional Information

Supplemental ASC, Figure H-1 (attached) shows the minor revisions associated with the facilities layout as shown in Figures C-2 and C-2A and discussed in the "Additional Information" subsection of Exhibit C in this Supplemental ASC.

EXHIBIT F

Property Ownership

This exhibit has not changed.

EXHIBIT G

Material Analysis

This exhibit has not changed.

ATTACHMENT H-1

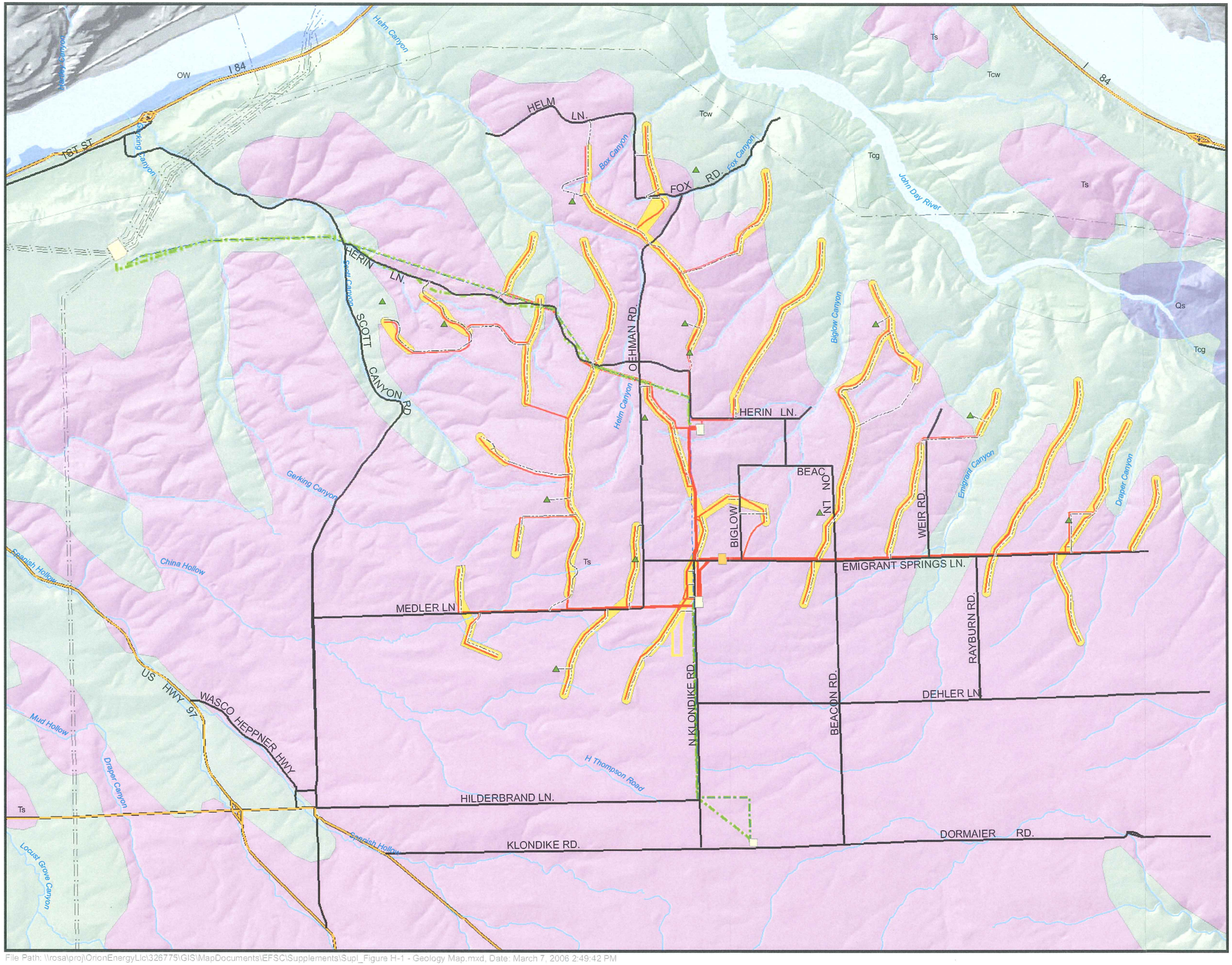
Revised Figure H-1

Figure H-1

Geology Map

Biglow Canyon Wind Farm Supplement

ORION ENERGY LLC



Legend

- Proposed Met Tower
- Proposed Facility Access Roads
- Existing Roads
- Existing Highways
- Proposed 34.5-kV Collector System
- BPA Proposed Transmission Line
- Orion Proposed Transmission Line
- Existing Transmission Line
- Proposed Turbine Corridors
- Alternate Turbine Corridor
- Existing Substation
- Proposed Substation / Proposed O&M Facility
- Proposed O&M Facility
- Rivers and Lakes
- (Qs) Lacustrine and fluvial sedimentary rocks
- (Tc) Columbia River Basalt Group and related flows
- (Tcg) Grande Ronde Basalt, Columbia River Basalt Group
- (Tcw) Wanapum Basalt, Columbia River Basalt Group
- (Ts) Tuffaceous sedimentary rocks and tuff
- (OW) Waterbody

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Source: Walker, G.W., and MacLeod, N.S., 1991, Geologic map of Oregon: U. S. Geological Survey

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ATTACHMENT I-1

Revised Figure I-1

Figure I-1

Soil Survey Map

Biglow Canyon Wind Farm Supplement

ORION ENERGY LLC

Legend

- Proposed Met Tower
- Proposed Facility Access Roads
- Existing Roads
- Existing Highways
- Proposed 34.5-kV Collector System
- BPA Proposed Transmission Line
- Orion Proposed Transmission Line
- Existing Transmission Line
- Proposed Turbine Corridors
- Alternate Turbine Corridor
- Existing Substation
- Proposed Substation / Proposed O&M Facility
- Proposed O&M Facility
- Rivers and Lakes

Soils Legend

- Anders very fine sandy loam (4B, 4C, & 5D)
- Anderly silt loam (1B,1C,2D,& 3D)
- Endersby fine sandy loam (11A & 12A)
- Lickskillet (15E, 16D, 16F, 17C, & 18E)
- Nansene (21E & 22F)
- Riverwash (25A & 35)
- Walla Walla silt loam (31B,31C,32D, 33D,53D,& 54D)
- Wato very fine sandy loam (34B,34D, 35D,& 36D)

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Source:
Soil Survey of Sherman County, Oregon (NRCS, 2004)

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EXHIBIT I

Soils

Additional Information

Supplemental ASC, Figure I-1 (attached) shows the minor revisions associated with the facilities layout as shown in Figures C-2 and C-2A and discussed in the "Additional Information" subsection of Supplemental ASC, Exhibit C.

ATTACHMENT J-1

Correspondence with Oregon Department of State Lands

Oregon
Theodore R. Kulongoski, Governor

Department of State Lands
1645 NE Forbes Rd., Suite 112
Bend, OR 97701
(541) 388-6112
FAX (541) 388-6480
www.oregonstatelands.us.

February 3, 2006

Orion Sherman County Wind Farm LLC.
Attn: Carlos V. Pineda
1611 Telegraph Ave, Suite 1515
Oakland, CA 94612

Re: State Application Number 35498-NSP
Biglow Canyon Wind Farm, Multiple intermittent drainages located in T. 2N, R. 18E, section 6 (crossings 1 & 2), and section 16 (crossing 3); and T. 2N, R. 17E, section 35 (crossings 4 and 5); section 36 (crossing 6), section 9 (crossing 7); and section 12 (crossing 8).

Dear Mr. Pineda:

We have received your application to construct road and electrical crossings associated with the Biglow Canyon Wind Farm in multiple intermittent drainages, in the locations identified above. The Department of State Lands requires a permit if you plan to remove, fill or alter 50 cubic yards or more of material within the banks of most waters of the state or designated wetlands. State-designated Essential Salmon Habitat streams and State Scenic Waterways are exceptions in that any amount of removal, fill or alteration typically requires a permit.

OAR 141-085-0015(2) states; to be subject to the requirements of the removal-fill law, the removal or fill must be within "waters of the state." The types of waters of the state and the physical limits of removal-fill jurisdiction are as follows: (c) Rivers, intermittent and perennial streams, lakes, ponds and all other bodies of water (except wetlands) subject to these rules, to the ordinary high water line, or absent readily identifiable field indicators, the bankfull stage. OAR 141-085-0010 (111) states that "Intermittent Stream" means any stream that flows during a portion of every year and which provides spawning, rearing or food-producing areas for food and game fish.

Based on an a field inspection on January 18, 2006 by Kevin Herkamp, of my staff, all of the crossings, except for crossing 7, are proposed at locations where the drainages do not meet the definition of an "Intermittent stream" as defined in OAR 141-085-0005(111). Crossing 7 does meet the definition, however based on the information provided, impacts will avoided at this location. The drainages at the locations of proposed impacts do not qualify as "waters of the state" as defined in OAR 141-085-0015(2(c)). Therefore a state removal-fill permit is not required.

You must also receive authorization, when required, from the U.S. Army Corps of Engineers and local planning department before beginning construction.

If you have any questions, please call Kevin Herkamp at (541) 388-6345.

Sincerely,

Eric D. Metz
Eastern Region Operations Manager
Wetlands and Waterways Conservation Division
Oregon Department of State Lands

cc: Rod French, Oregon Dept. of Fish and Wildlife
Karla Ellis, Corps of Engineers, Portland District
Sherman County Planning Dept.
Cathy Van Horn, Department of Energy
Carrie Konkol, CH2M HILL, Inc. (agent)

ATTACHMENT J-2

Revised Figure J-1

Figure J-1

Jurisdictional Wetlands & Waters

Biglow Canyon Wind Farm
Supplement

ORION ENERGY LLC

Legend

- Potential Jurisdictional Waters
- (POWHX) NWI Wetlands
- Proposed Met Tower
- Proposed Facility Access Roads
- Existing Roads
- Existing Highways
- Proposed 34.5-kV Collector System
- BPA Proposed Transmission Line
- Orion Proposed Transmission Line
- Existing Transmission Line
- Proposed Turbine Corridors
- Alternate Turbine Corridor
- Existing Substation
- Proposed Substation / Proposed O&M Facility
- Proposed O&M Facility
- Streams

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Source:
U.S. Fish & Wildlife Service, National Wetlands Inventory
USGS, 7.5-Minute Quad Maps: Klondike (1971), Quinton (1976), Rufus (1971), and Wasco (1987)

File Path: \\rosa\proj\OrionEnergyLlc\326775\GIS\MapDocuments\EFSC\Supplements\Supl_Figure J-1 - Wetland & Jurisdictional Waters.mxd, Date: March 7, 2006 2:54:00 PM

EXHIBIT J

Wetlands

Comment

(Exhibit J, Section J.2, page J-1) Please work with DSL to determine whether Orion must prepare a wetland delineation report that conforms to the requirements of OAR 141-090-0020 and takes into account all disturbances that could result from final placement of turbines and related or supporting facilities within the wind turbine corridors. In the event that DSL determines that no wetland delineation report is necessary, ODOE will require a letter from DSL confirming that decision.

Response

Kevin Herkamp of the Oregon Department of State Lands has indicated that a Wetland Delineation Report is not necessary because the Facility does not impact wetlands (see Attachment J-1).

Comment

(Exhibit J, Section J.6, page J-6) Submit any revised removal-fill permit application to ODOE and the Oregon Department of State Lands.

Response

On January 18, 2006, Kevin Herkamp of the DSL conducted a site visit to determine if stream or drainage crossings 1, 2, 3, 4, 5, 6, 7, and 8 are "waters of the state." "Waters of the state" as defined in OAR 141-085-0015(2) are "rivers, intermittent and perennial streams, lakes, ponds and all other bodies of the water (except wetlands)..."

During that visit and in the subsequent letter dated February 3, 2006, DSL determined that none of the above-mentioned intermittent stream or agricultural drainage crossings, except crossing 7, meets the definition of "intermittent stream" as defined in OAR 141-085-0005(111)[3]. DSL also determined that the Applicant will not need to submit a Joint Permit Application (JPA) to DSL for this project. Crossing 7 meets the above-referenced definition of an intermittent stream, but impacts are avoided at this crossing.

Additional Comment

In a conference call on January 6, 2006, the Department requested additional information regarding impacts to drainages 2 and 7 as discussed on page J-4.

[3] See Attachment J-1, letter from Eric D. Metz, ODSL, February 3, 2006.

Response

The following sentence on page J-4 is inaccurate and will be deleted from the text: "Drainages 2 and 7 will be affected solely by the widening of an existing road for access." This sentence is a relic from an earlier version of Exhibit J.

Additional Information

Supplemental ASC Figure J-1 (attached) shows the minor revisions associated with the facilities layout as shown in Figures C-2 and C-2A and discussed in the "Additional Information" subsection of Supplemental ASC, Exhibit C.

Potentially jurisdictional wetlands and/or waters are not present in the vicinity of the proposed new facilities. This determination was made by the Applicant's technical consultants based on an office review of the revised figures (Figures C-2 and C-2A) and prior knowledge and understanding of the habitat in the project site (including the June 2005 wetland/waters determinations and the January 2006 site visit with DSL to determine jurisdiction). As stated in ASC Exhibit J, there are no impacts to wetlands, and the modifications referenced above present no new impacts.

EXHIBIT K

Land Use

The Applicant submits the following responses to the questions raised in the February 6, 2006, memorandum, from Jesse Ratcliffe and Virginia Gustafson, Oregon Department of Justice (DOJ), to Catherine Van Horn, Oregon Department of Energy. For clarity, the DOJ questions are divided up and reprinted verbatim, followed by the Applicant's responses.

Comment

Section K.2: Land use analysis area and map (Page K-2)

The map provided to comply with OAR 345-021-0010(1)(k)(A) does not show comprehensive plan designations (although the narrative says it does.) The map shows only the zoning. The RAIs should request a revised map that includes comprehensive plan designations.

Response

Figure K-1 (and the Agricultural Zone shown within the figure) provides an accurate description of the Sherman County Comprehensive Plan (SCCP or Comprehensive Plan) land use designation and is not inconsistent with the Comprehensive Plan.

To clarify the response to OAR 345-021-0010(1)(k)(A), the Applicant suggests making the text changes below.

Figure K-1 depicts the Facility location; shows the Sherman County land use zones of the Facility site and property adjacent to the site; shows all areas of the site that might be temporarily disturbed during the design, construction, and operation of the Facility; and identifies a half-mile land use study area around the proposed Facility and all related or supporting facilities. Figure K-2 depicts actual land uses within the study area. The SCCP map does not delineate zoned Agricultural Lands as either Rangeland or Cropland. However, according to the Sherman County Planning Department, the zoning designations shown on Figure K-1 are derived, in part, from the SCCP and are not inconsistent with the various land use designations described in the SCCP (Georgia Macnab, Sherman County Planning Department, pers. comm., 2006).

Comment

Section K.5.1: Energy Generating Facility's Compliance with ORS 215.283(2)(g) and SCZO 3.1.3(e)(17) (Pages K-4-5)

In the discussion of whether the impact to accepted farm practices will be significant, the analysis concludes that they are not, considering the size of the "footprint in comparison to the overall acreage in agricultural production in the surrounding lands." However, the analysis does not provide a specific percentage of overall acreage that will be disturbed. The inclusion of a specific percentage will significantly strengthen the analysis.

Response

In 1997, 80 percent of the land in Sherman County was farmland, with 30 percent in harvested cropland (Loy and Allan, 2001[4]). More specifically, the approximate land area of farms and land in farms in Sherman County is 526,853 acres (National Agricultural Statistics Service, 2002[5]). The Biglow Canyon Wind Farm Facility will be built within approximately 25,000 acres of land under wind energy easement. The permanent footprint of the project will impact approximately 166 acres within the 25,000 acres of land, of which approximately 150 acres are impacts to agricultural lands. If it is assumed that approximately 80 percent of the 25,000 acres of land under easement is farmland (approximately 20,000 acres), then the impact of the Facility to the surrounding area is less than one percent (approximately 0.75 percent).

Comment

Section K.5.3 Applicable Local Substantive Criteria: SCZO §5.8(16)- Specific Requirements for Non-farm Uses in F-1 Zone

The analysis relies (correctly) on the substance of the surveys of nearby farm owners, and the facts of why the farmers have concluded the use will not seriously interfere. The analysis would, however, benefit by additional information. Specifically, at page K-24, the analysis states that "the amount [of land] removed from production is a small percentage of the farm land in the vicinity of the facility." As at pages K-4-5, the specific percentage is not provided.

Response

See preceding response. The percentage is on the order of 0.75 percent.

Comment

Similarly, the analysis concluding that the facility will not materially alter the overall land use pattern reasons that the "facility will be located exclusively on tracts of land where the footprint is small in comparison to the total farmed acreage in the tract and thus there is a negligible likelihood that the facility will change the pattern of land use..." [Page K-26] A quantification of that comparison would provide a much stronger analysis.

Response

Please see Table K-1 (below). The information presented in Table K-1 quantifies the total estimated maximum acreage of the Facility's permanent infrastructure (or footprint) in comparison to the total acreage within top five landowner parcels in terms of preliminary turbine siting[6]. It should be noted that the Applicant has employed a worst case analysis to determine facility disturbance, i.e. we used our maximum build-out of 225 wind turbines.

---

[4] Loy, W.G., and Allan, S. 2001. Atlas of Oregon. Second Edition. ISBN 0871141027. University of Oregon Press, Eugene, Oregon.

[5] National Agricultural Statistics Service. 2002. 2002 Census of Agriculture. Volume 1, Chapter 2, Oregon County Level Data. U.S. Department of Agriculture. http://www.nass.usda.gov/census/census02/volume1/or/index2.htm

[6] Please note that all turbine siting is preliminary. No final siting decisions or commitments to landowners, including number of turbines in any given parcel or position of turbines within any turbine corridor, have been made.

Table K-1. Total Estimated Maximum Acreage of Facility Footprint

Parcel ID	Turbine Count	Total Acres	Acres Disturbed Turbines and Associated Facilities	Percent of Tract Disturbed
8300	9	637.9	6.146	0.96%
4800	7	480	5.303	1.10%
1600	6	320	3.852	1.20%
3600	5	319.32	5.306	1.66%
1400	5	816.83	4.496	0.55%
Total	32	2,574.05	25.103	0.98%

Note: Changes in the disturbance area shown in Revised Table C-1 are not included in the areas shown above. These changes do not significantly alter the areas shown above because they constitute a small fraction of the total permanent impact, and/or because they represent temporary construction impacts.

As shown in Table K-1, the footprint of facilities occupies a fraction of the land area in relation to the total of the tracts in the given sample area (< 1 percent). Furthermore, on a per tract basis the footprint does not exceed 2 percent of any given tract. The footprint of the Facility as a percentage of total tract size is substantially similar or smaller throughout the land area that would be potentially occupied by the Facility.

Comment

Finally, there are problems with the applicant's analysis of SCZO §5.8(16), which provides criteria for conditional non-farm uses in an F-1 zone. The applicant must meet each of the criteria for the conditional use to be permitted. However, the analysis of the "generally unsuitable" standard does not establish that the land is generally unsuitable for production of farm crops. As an alternative to meeting the criteria of SCZO §5.8(16), the applicant can attempt to meet the requirements for a Goal 3 Exception. The "generally unsuitable" analysis does provide a factual argument to justify a Goal 3 Exception from SCZO §5.8(16), but neither the analysis nor the Goal 3 Exception request in Section K.5.4 (page K-27) specifically requests such an exception. The language of the Goal 3 Exception request does, however, at least mention the "generally unsuitable" standard, which suggests that the applicant probably intended the Exception to cover that standard as well. An RAI is needed to (1) better justify how the land can be generally unsuitable for the production of farm crops when, in fact, there are crops growing on it now, and the application is premised on the fact that farm crops will continue to be grown on the property except for in the areas of the turbine footprints; and (2) explain that, in the alternative, the applicant is requesting a Goal 3 exception because this standard is not satisfied. The Goal 3 exception provides a much stronger rationale.

Relatedly, the Goal 3 Exception section itself (at Page K-27) should include an analysis of why the use should be allowed on land that is not unsuitable for the production of farm crops is missing. Presently, the Goal 3 Exception section addresses only the size issue in OAR 660-33-0130(22) – why the use must use more than 20 acres of non-high-value farm land.

Response

CZO 5.8(16)(d) requires that a non-farm use in the F-1 zone be situated on "generally unsuitable land for the production of farm crops and livestock." As discussed in the first response, above, the Facility site and surrounding lands are designated agricultural in the Comprehensive Plan and are zoned, and used, for farm and range use. With almost no exception, the lands are not irrigated and do not meet the definition of high value farmland.

CZO 5.8(16)(d), protecting agricultural lands from encroachment by non-farm uses, implements Statewide Land Use Planning Goal 3. The Applicant hereby clarifies that the Goal 3 exception requested in the original application is intended to include the Facility's potential failure to meet this provision.[7] This request is in addition to the other reason for the Goal 3 Exception, the Facility's failure to meet the 12/20 acre limit on commercial energy generating facilities. However, it does not change the size or scope of the requested exception.

Regarding the rationale for the exception, the following analysis is offered (tracking the section headings of the Goal 3 exception in the original application):

1. Reasons Justify the Exception.

   a. Locational Dependence. In addition to the reasons presented in the original application, the Applicant points out that the Facility is "locationally dependent" with respect to surrounding lands classified F-1 and actually used/potentially suitable for farm crops. Because the Facility area consists primarily of broad, flat ridge tops bisected by steep canyons, and because both farming and wind facilities must be located on these flat ridge tops, there would be no way to construct the Facility on land "generally unsuitable" for farming (i.e., narrow canyons and steep, rocky slopes). Moreover, as stated in the original application, while the land to be disturbed is used for farming, it affords marginal returns at best and is suitable only for a limited range of crops and not for livestock.

   b. State and County Policies. The narrative in the original application applies, since it relates to the other important state and local policies furthered by the Facility.

2. ESEE consequences favor the exception.

   The narrative in the original application applies; the inability to meet the 12/20 acre rule and the inability to meet the "unsuitable land" rule do not drive different sets of ESEE consequences.

3. The Facility is Compatible with other Adjacent uses.

   The narrative in the original application applies. The Facility is compatible with adjacent farm uses even though it must be located on land suitable for farming. This is because the Facility will occupy a relatively small percentage of the surrounding lands in farm production (see preceding response above), will not interfere with

[7] It is assumed for this purpose that the Facility does not meet the standard because most of the F-1 land to be permanently impacted by the Facility is in agricultural production, but the Applicant reserves the right to argue that this land is "generally unsuitable the production of farm crops" as asserted in the original application.

farming on lands not occupied by Facility structures, and will provide lease revenues to owners of farm lands on which the Facility is located.

Additional Information

Supplemental ASC, Figures K-1, K-2, and K-3 (attached) show the minor revisions associated with the facilities layout as shown in Figures C-2 and C-2A and discussed in the "Additional Information" subsection of Supplemental ASC, Exhibit C.

The corridor modification shown in Supplemental ASC, Figures K-1 through K-3 represents a smaller disturbance area than the area shown in the ASC. Consequently, impacts to agricultural-zoned land actually are less than impacts described in the ASC.

ATTACHMENT K-1

Revised Figures K-1, K-2, and K-3

Figure K-1
Zoning Map

Biglow Canyon Wind Farm
Supplement

ORION ENERGY LLC

Legend

- Proposed Met Tower
- House
- Proposed Facility Access Roads
- Existing Roads
- Existing Highways
- Proposed 34.5-kV Collector System
- BPA Proposed Transmission Line
- Orion Proposed Transmission Line
- Existing Transmission Line
- Proposed Turbine Corridors
- Alternate Turbine Corridor
- Existing Substation
- Proposed Substation / Proposed O&M Facility
- Proposed O&M Facility
- John Day Rim Mitigation Area
- Rivers and Lakes
- Tax Lots
- 1/2-mile Land Use Analysis Area

Zoning

- Agricultural
- Airport
- Rural Commercial
- Rural Residential
- Refuge
- Urban

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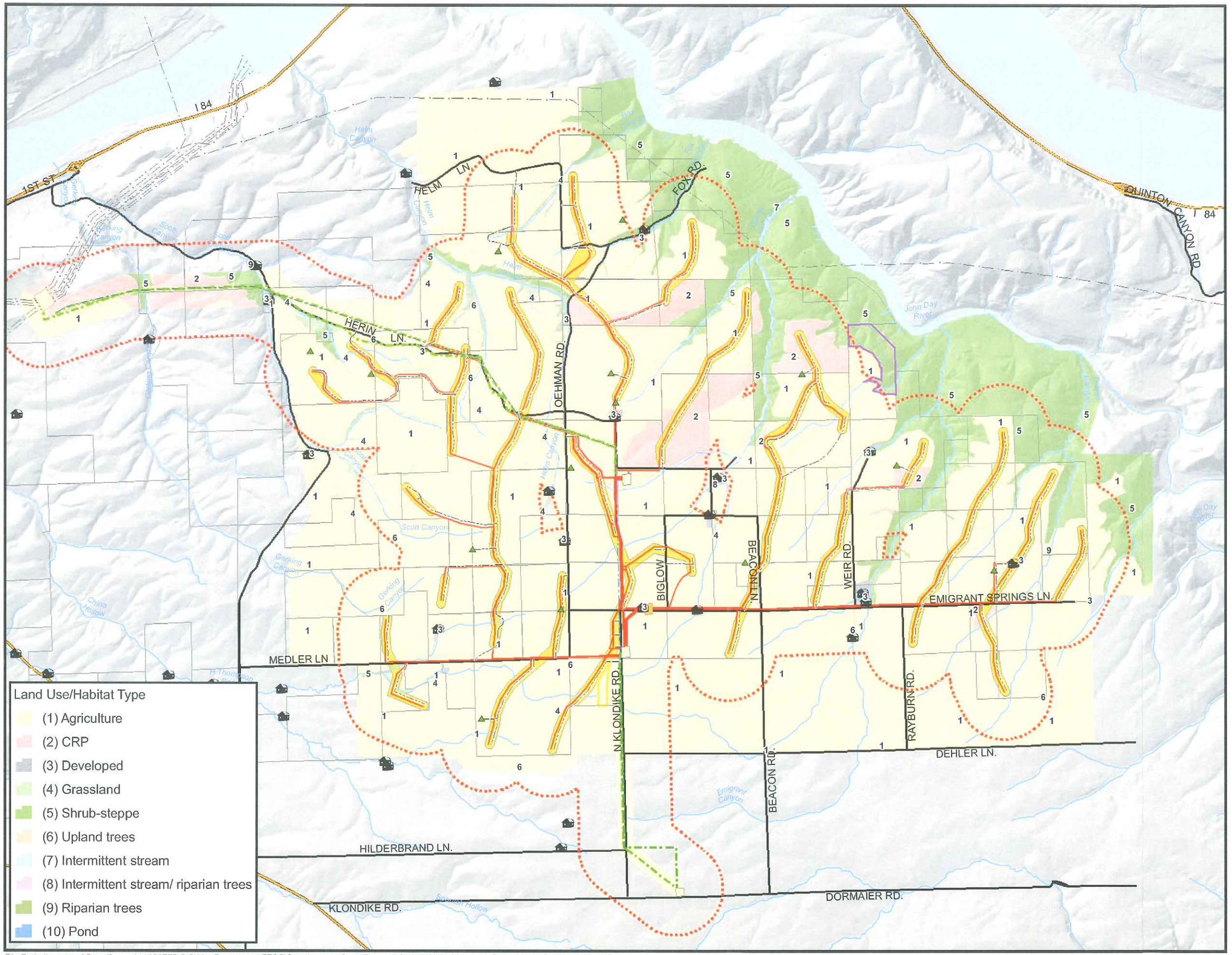
Figure K-2
Land Use Map

Biglow Canyon Wind Farm
Supplement

ORION ENERGY LLC



Legend

- Proposed Met Tower
- House
- Proposed Facility Access Roads
- Existing Roads
- Existing Highways
- Proposed 34.5-kV Collector System
- BPA Proposed Transmission Line
- Orion Proposed Transmission Line
- Existing Transmission Line
- Proposed Turbine Corridors
- Alternate Turbine Corridor
- Existing Substation
- Proposed Substation / Proposed O&M Facility
- Proposed O&M Facility
- John Day Rim Mitigation Area
- Rivers and Lakes
- Tax Lots
- 1/2-mile Land Use Analysis Area

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Data Collected by West, Inc. (2005)

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Figure K-3

Soils - Land Capability Classification

Biglow Canyon Wind Farm
Supplement

ORION ENERGY LLC

Legend

- Proposed Met Tower
- House
- Proposed Facility Access Roads
- Existing Roads
- Existing Highways
- Proposed 34.5-kV Collector System
- BPA Proposed Transmission Line
- Orion Proposed Transmission Line
- Existing Transmission Line
- Proposed Turbine Corridors
- Alternate Turbine Corridor
- Existing Substation
- Proposed Substation / Proposed O&M Facility
- Proposed O&M Facility
- John Day Rim Mitigation Area
- Rivers and Lakes
- Tax Lots

Land Capability Classification

- Class II
- Class III
- Class IV
- Class VII
- Class VIII
- No Data

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Source:
Soil Survey of Sherman County, Oregon (NRCS, 2004)
Soil Survey of Gilliam County, Oregon (NRCS, 2004)
Soil Survey of Klickitat County, Washington (NRCS, 2004)

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EXHIBIT L

Impacts on Protected Areas

This exhibit has not changed.

EXHIBIT M

Financial Analysis

This exhibit has not changed.

EXHIBIT N

Nongenerating Facility Information

This exhibit has not changed.

EXHIBIT O

Water Resources

Comment

NOTE: Orion states that water use during operation of the facility would be limited to a restroom, kitchen, and utility sink in the O&M building and would not be expected to exceed 1,000 gallons per day. Orion states that it would install a well for this purpose but that a water right would not be required because the use would qualify as an exempt industrial use, i.e., it would constitute an industrial or commercial use not exceeding 5,000 gallons per day. ORS 537.545(1), Orion, or its designated contractor, must keep a log of the well and furnish a certified copy of the log to the Water Resources Commission within 30 days after completion of its construction.

Response

Comment noted. Orion or its designated contactor will keep a log of the well and furnish a copy of the log to the Water Resource Commission within 30 days after completion of its construction.

EXHIBIT P

Fish and Wildlife Habitats and Species

Comment

In a November 18, 2005, letter, Rose Owens, Habitat Special Projects Coordinator for the Oregon Department of Fish and Wildlife, noted the following concerns about wildlife:

a. *Page P-15, Table P-4*: Please clarify why nine bird species are listed as N/A. Note that Table P-4 has the Great Horned Owl listed as N/A although Table P-3 and Attachment P-2, Figure 14 (Raptor Nest Result Survey 2004) shows one active GHOW nest within the 2-mi Turbine Buffer and five active nests in the 2004 Nest Survey Area.

Response

The "N/A" were for observations usually made in-transit or incidentally. The Applicant has reviewed each one in detail and the following table clarifies where the observations were made.

Species	Location[a]
Ferruginous hawk	P
Golden eagle[b]	B
Great horned owl	B
Short-eared owl	P
Bewick's wren	P
Yellow-headed blackbird	P
Wild Turkey - (domesticated)	P
Bullock's Oriole	P
Unidentified empidomax	P

[a] P=Facility or Project area only, R=Reference area only, B=both areas.

[b] Two incidental observations during 2004 nest survey (one in Project area, one in reference area). Additional golden eagle nest site discovered by Oregon Department of Fish and Wildlife (ODFW) in fall 2005 that looked like it may have been active in 2005.

Comment:

b. *Page P-20, P.3.3.3 (Raptor Nest Surveys):* Note that ODFW biologists on 9/20/05 saw a potential Golden Eagle nest on the John Day River south of the LePage Park that is not listed on the nest surveys. ODFW says this location is within the raptor nest survey area and close to the 2-mile turbine buffer. The nest is on a cliff about 75 feet above the John Day River.

Response

The above-referenced nest is approximately 2.25 miles from the nearest turbine corridor and is therefore outside the 2-mile buffer. This nest appears to be a new nest, likely established since the 2004 Raptor Nest Survey, because it was not detected during the 2001 or the 2004 nest surveys. This nest site will be surveyed during post-construction monitoring.

Comment:

c. *Page P-22 through P-24, Table P-7*: Please note that the Western Rattlesnake is listed as a sensitive species only in the Willamette Valley. The Western Meadowlark is listed as a sensitive species only in the Willamette Valley. The California Big Horn Sheep is not listed as a Federal Status Species of Concern in Oregon.

Response

Corrections noted.

Comment:

d. *Page P-24*: Nocturnal jackrabbit surveys were conducted twice. Three additional white-tailed jackrabbit surveys were observed during nocturnal surveys. What other nocturnal survey s were conducted besides the spotlight counts?

Response

Three jackrabbits were observed during the two nocturnal jackrabbit surveys. There were no other nocturnal surveys for jackrabbits besides the spotlight counts.

Comment:

e. The analysis of the anabat data compared the results with four other wind farms around the country and showed that the Biglow Canyon site has low expected bat occurrence. How does the bat sampling protocol used at Biglow compare with the other four sites, particularly in terms of sample size and survey hours? The data from Biglow Canyon was from one month of surveys and may be misrepresented without a discussion and comparison of sampling effort used at the other sites.

Response

The table below summarizes the sampling efforts from the four referenced bat research studies and the Biglow Canyon study that used Anabats for measuring bat call rates.

Project Area	Study Period	Detector Nights	Reference
Biglow Canyon, OR	Sep 15 – Oct 21, 2005	36	West (2005)
Mountaineer, WV	Aug 1 – Sep 14, 2004 (post-construction)	33	Arnett, pers. comm.
Foote Creek Rim, WY	Jun 15 – Sep 1, 2000 & 2001 (post-construction)	39	Gruver (2002, M.S. Thesis)
Buffalo Ridge, MN	Jun 15 – Sep 1 2001 (post-construction)	216	Johnson et al. (2003)
Buffalo Mountain, TN	Apr 1 – Sep 30, 2001, 2002 (post-construction)	149	Fieldler (2004, M.S. Thesis)

In the Biglow Canyon study, only six bat calls were recorded during the 36 detector nights of the study, indicating very low call rates compared to these other studies. Given that mortality data from operating wind projects in the Pacific Northwest have shown peak mortality in the fall (September and October), that bat mortality levels have been relatively consistent among these Pacific Northwest projects, and that only six calls were recorded during the Biglow Canyon fall study, the timing and effort levels of the Biglow Canyon bat call study were sufficient to help predict bat mortality levels at the Facility.

Sources:

Arnett, E.B. Personal communication.

Fiedler, J.K. 2004. Assessment of bat mortality and activity at Buffalo Mountain Windfarm, eastern Tennessee. M.S. Thesis. Knoxville, TN, University of Tennessee.

Gruver, J.C. 2002. Assessment of bat community structure and roosting habitat preferences for the hoary bat (*Lasiurus cinereus*) near Foote Creek Rim, Wyoming. M.S. Thesis, University of Wyoming, Laramie. 149 pp.

Johnson, G.D., M.K. Perlik, W.P. Erickson, M.D. Strickland, D.A. Shepherd, and P. Sutherland, Jr. 2003. Bat interactions with wind turbines at the Buffalo Ridge, Minnesota Wind Resource Area: An assessment of bat activity, species composition, and collision mortality. Electric Power Research Institute, Palo Alto, California, and Xcel Energy, Minneapolis, Minnesota. EPRI report # 1009178.

WEST. 2005. Additional 2005 Fall Wildlife Surveys, Biglow Canyon Wind Farm, Sherman County, Oregon.

Comment:

f. Throughout Exhibit P, the phrase "one full year of weekly surveys, occurring approximately twice a month at each station" is used to describe sampling effort. ODFW says this phrase is confusing. Please provide a table or spreadsheet with the actual field data collected at each station on each sample day. Please group the data according to survey location and habitat type.

Response

Survey data were collected each week at either the reference area or project area. The ASC shows data grouped by survey station in Figures 8 through 11 of ASC Attachment P-2 and Figures 8 and 9. Habitat of each survey station was included in the map e-mailed to ODFW on September 16, 2005.

Comment:

g. *Attachment P-6, Biglow Canyon Turbine Micro-Siting Report*: This report is useful for addressing habitat, topographic and physiographic features of the landscape that may influence avian and wildlife use of the area. Those factors used in this analysis should be incorporated into the conceptual framework of the monitoring plan.

Response

Comment noted (see *Mitigation and Monitoring Plan*, December 2005).

Comment

Please describe the location of potential mitigation areas and, to the extent possible, provide evidence of Orion's control over those areas.

Response

Orion has identified several potential mitigation project sites. The primary candidate is the John Day River Upland Rim located near the northeast corner of the Facility area overlooking the John Day River.

Additional Information

The transmission line reroute in the north should reduce the overall impact to habitat and wildlife. The mapping tiles that have been updated as a result of the changes in the transmission line reroute and substation location modification are shown in Figures 2, 3, 6, and 9. These replace the corresponding mapping tiles in Figures 2, 3, 6, and 9 of ASC Exhibit P.

The route will now be a greater distance from an active Swainson's hawk nest and the category 1 habitat polygon than the previous route (Figure 2). In addition, the new reroute is no longer adjacent to the shrub-steppe habitat to the west of the Swainson's hawk nest. The overall acreage of direct impacts to grassland and shrub-steppe habitats (Category 3 and 4) does not increase with these changes.

Although the habitat-impacted acreages for Category 1 through Category 4 do not technically change, three small areas have not been surveyed for sensitive grassland surveys within 750 feet of the transmission line reroute and the modified location of the substation (see Figures 2 and 6). While some small areas have not been surveyed, adjacent areas have been surveyed, and it is extremely unlikely that the habitat characterization of these small patches of habitat will change as a result of the sensitive species surveys. For the habitat category to change in these areas as a result of the surveys, raptor nests such as Swainson's hawks or burrowing owls will need to be found in these areas. There are no nest structures for Swainson's hawks and other raptors in these areas, and it is highly unlikely that

burrowing owls occur in these areas. If a burrowing owl did occur in these areas, it would likely have been seen during the various surveys conducted near these areas.

A small patch of low-quality shrub-steppe habitat (mapped as Category 4) in section 13 adjacent to, but not directly impacted by the transmission line route has not fully been surveyed (Figure 6). It is very unlikely that sensitive species other than songbird species (e.g., grasshopper sparrow) would be found in this area, given the small patch size and the quality of the habitat. The patch was characterized as Category 4 during habitat mapping.

A relatively small area of Conservation Reserve Program to the north of the substation was not surveyed for sensitive species (Figure 6). The area to the east of this patch was surveyed, and grasshopper sparrows and white-tailed jackrabbits were the only sensitive species observed (see ASC Figure 15, Attachment P-2, Exhibit P). This area is located next to the public road, will not be directly impacted by the facilities (substation or collector lines), and therefore, will not change the direct habitat impact calculations. It is very unlikely that sensitive species other than songbird species (e.g., grasshopper sparrow) will be found in this area, given the results of surveys in the areas to the east. The patch was characterized as Category 3 during habitat mapping.

The third small sliver of an area that has not been surveyed is approximately 400 feet north of the transmission line reroute (Figure 2). This native grassland and shrub-steppe area is unlikely to contain any sensitive species that will change the habitat ranking (currently Categories 3 and 4). Since these areas are not to be directly impacted by the Facility changes, no measurable changes to the impacts will occur.

The collector line additions described in Figure C-2A are on cultivated and developed land and do not require additional sensitive species surveys.

Figure 9 shows the other change resulting from the reroute near the southern substation location. The habitat is all located in cultivated wheat fields.

The minor modifications to the collector line layout increase the amount of temporary disturbance to habitat by approximately 13 acres (see Revised Table P-8). In addition to the minor modifications to the collector line layout, there will be a slight increase in the permanent disturbance at the Facility site. This increase can be attributed to a widening of the intersections from county roads to turbine access roads. These intersections will result in a slight increase in the total permanent disturbance at the Facility site by 7 acres. More than 96 percent of the increase in permanent disturbance will occur on Category 6 land (see Revised Table P-8).

Revised Table P-8. Total Habitat Acreage within Potential Impact Zone and Estimated Quantity of Disturbance or Loss of Categorical Habitats and Associated Habitat Types, within the Biglow Canyon Wind Farm Facility Area

		Impacts	
	Total Acres (within 750 feet of facilities)	Temporary Facilities[1] (acres disturbed)	Permanent Facilities[2] (acres lost)
Category 1	**2.64**	**0.00**	**0.00**
Upland Trees[3]	2.64	0.00	0.00
Category 2	**13.73**	**0.00**	**0.00**
Intermittent Stream/Riparian Trees	0.18	0.00	0.00
Riparian Trees	0.08	0.00	0.00
Shrub-steppe	13.47	0.00	0.00
Category 3	**931.47**	**14.92**	**7.59**
CRP	709.56	13.47	7.42
Shrub-steppe	215.96	1.45	0.17
Intermittent streams	0.22	0.00	0.00
Upland trees	5.47	0.00	0.00
Pond	0.26	0.00	0.00
Category 4	**313.2**	**4.13**	**3.66**
CRP	138.31	3.07	2.70
Shrub-steppe	38.80	0.06	0.08
Grassland	136.09	1.00	0.88
Category 5	**0.00**	**0.00**	**0.00**
Category 6	**10,430.12**	**368.73**	**161.64**
Developed	64.43	5.23	4.89
Agricultural	10,365.69	363.5	156.75
PREVIOUS TOTAL		**374.75**	**165.88**
TOTAL	**11,691.16**	**387.92[4]**	**172.89[4]**

[1] 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.

[2] Permanent facilities include: turbine pads and towers, substation and alternate substation, meteorological towers, O&M facility, access road intersections, and permanent access roads.

[3] Habitat with active Swainson's hawk nest (2004 and 2005).

[4] Because some Facility impact areas overlap, the total Facility disturbance to habitat, as shown in Table P-8, is less than the sum of all Facility impact areas, as shown in Table C-1.

ATTACHMENT P-1

Revised Figures P-1, P-2, P-3, P-6, and P-9

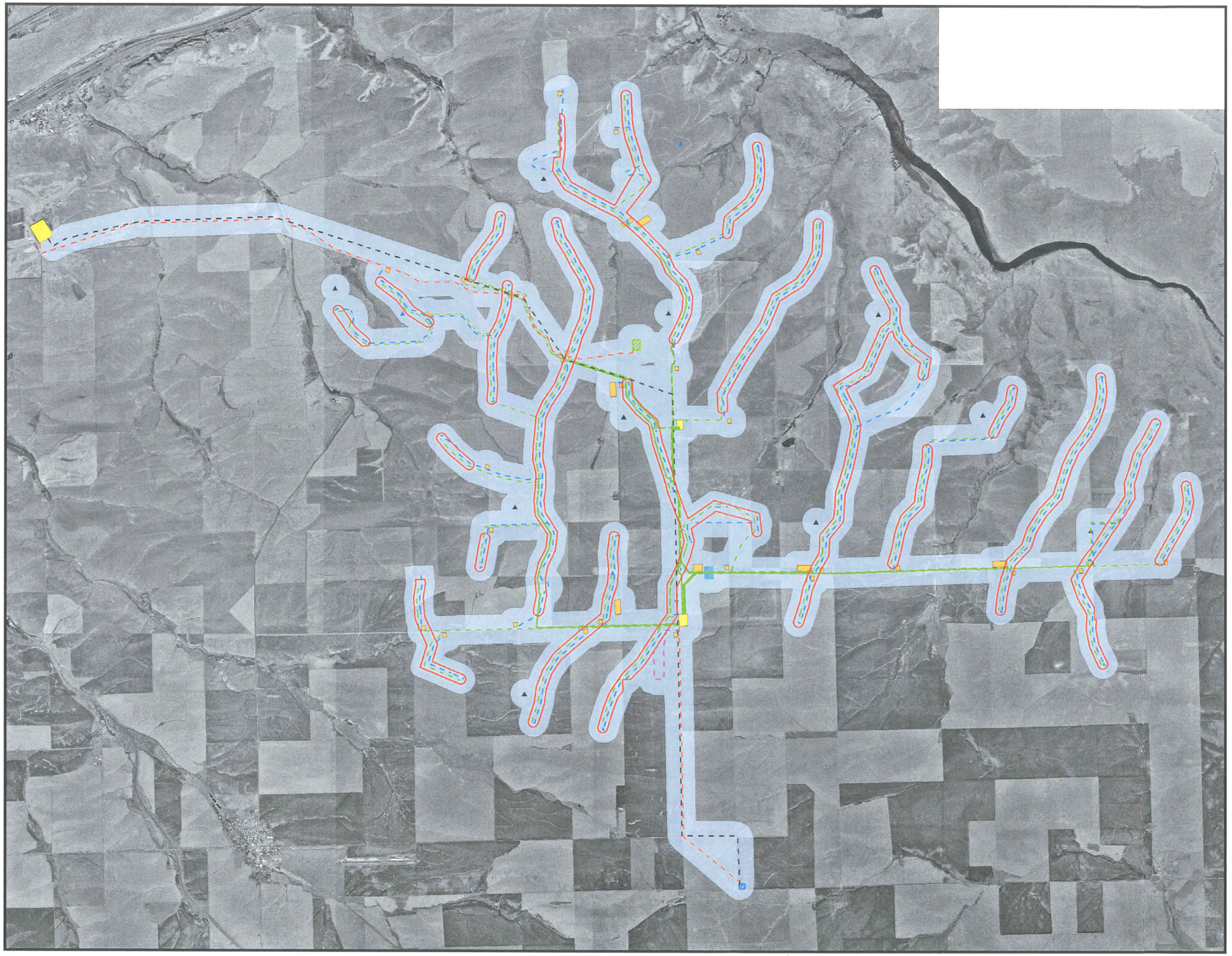

Figure P-1. Biglow Canyon Wind Project Habitat Analysis Area - Overview.

- Turbine Corridor
- New Facilities - 750-ft Buffer
- New Proposed Transmission Line
- Previous Proposed Transmission Line
- Proposed Collector System
- Access Rds - New or Improved

Met Towers

- Permanent
- Temporary

- Proposed Substation
- Previous Proposed Substation
- Proposed BPA substation
- O&M Facility
- Staging Areas
- Habitat Analysis Area

N
W E
S

0 0.5 1 2 3

Kilometers

WEST, Inc.

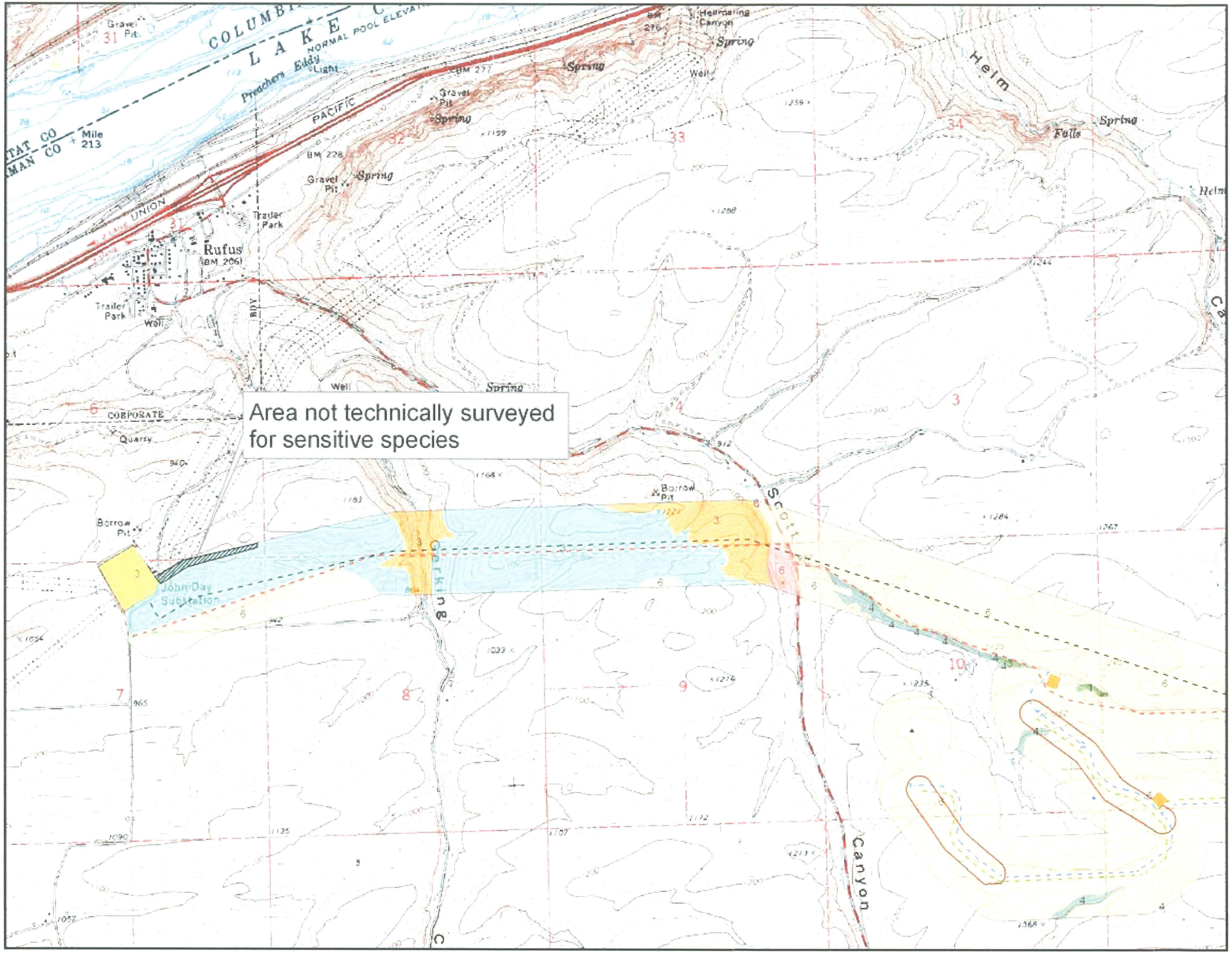

Figure P-2. Biglow Canyon Wind Project Habitat Analysis Area - 1 of 9.

- Turbine Corridor
- New Facilities - 750-ft Buffer
- New Proposed Transmission Line
- Previous Location of Transmission Line
- Proposed Collector System
- Access Rds - New or Improved

Met Towers

- Permanent
- Temporary
- Proposed Substation
- O&M Facility
- Staging Areas

Habitat

- Agriculture
- CRP
- Developed
- Grassland
- Intermittent stream/ riparian trees
- Pond
- Shrub-steppe
- Upland trees

Habitat Categories 1 - 6

	A2	A3
B1	B2	B3
C1	C2	C3

N
W E
S

0 0.5 1
Kilometers

WEST, Inc.

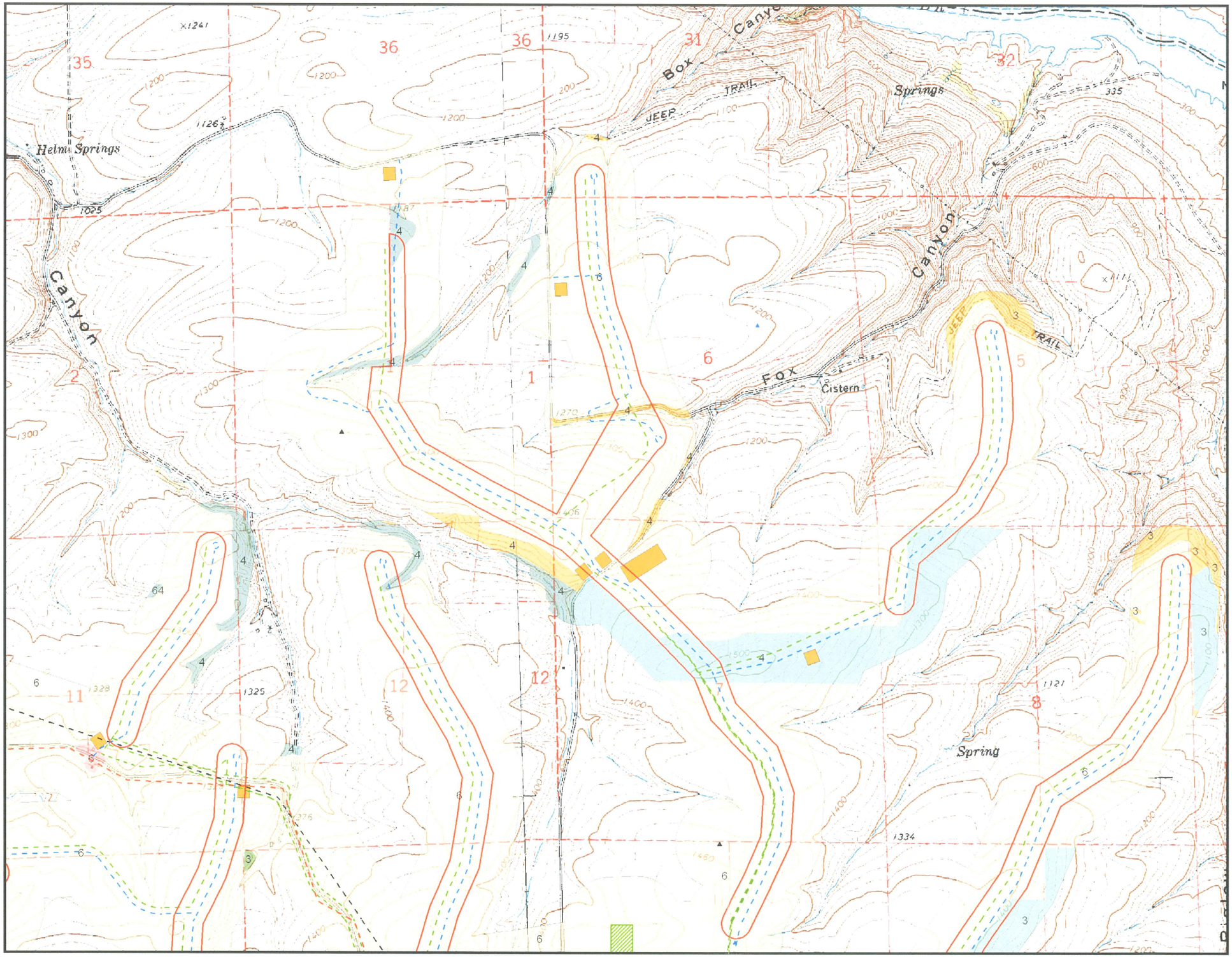

Figure P-3. Biglow Canyon Wind Project Habitat Analysis Area - 2 of 9.

- Turbine Corridor
- New Facilities - 750-ft Buffer
- New Proposed Transmission Line
- Previous Proposed Transmission Line
- Proposed Collector System
- Access Rds - New or Improved

Met Towers

- Permanent
- Temporary

- Proposed Substation
- Previous Proposed Substation
- Proposed BPA substation
- O&M Facility
- Staging Areas

Habitat

- Agriculture
- CRP
- Developed
- Grassland
- Intermittent stream/ riparian trees
- Pond
- Shrub-steppe
- Upland trees

Habitat Categories 1 - 6

A1		A3
B1	B2	B3
C1	C2	C3

N
W E
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0 0.5 1
Kilometers

WEST, Inc.

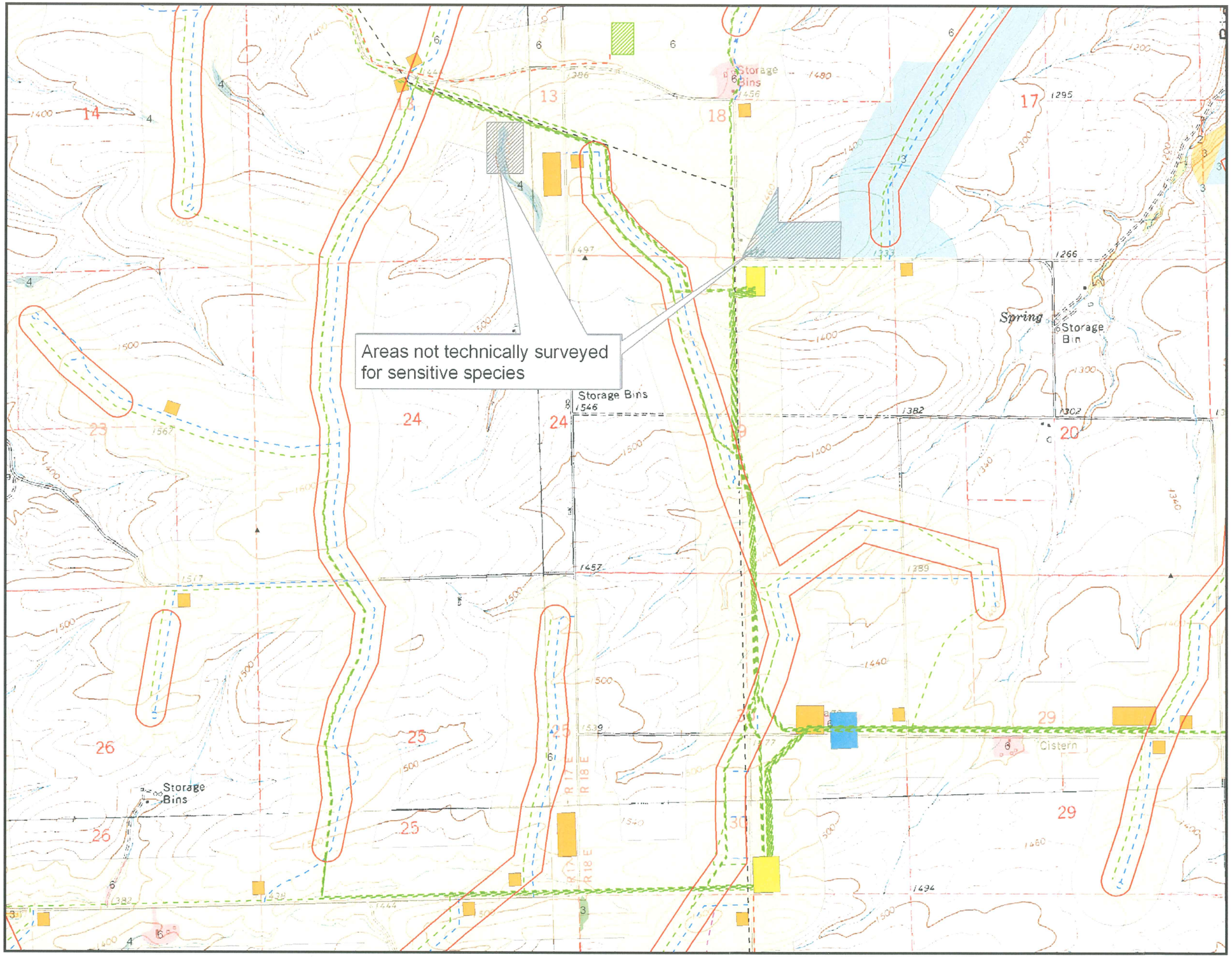


Figure P-6. Biglow Canyon Wind Project Habitat Analysis Area - 5 of 9.

- Turbine Corridor
- New Facilities - 750-ft Buffer
- New Proposed Transmission Line
- Previous Proposed Transmission Line
- Proposed Collector System
- Access Rds - New or Improved

Met Towers

- Permanent
- Temporary

- Proposed Substation
- Previous Proposed Substation
- Proposed BPA substation
- O&M Facility
- Staging Areas

Habitat

- Agriculture
- CRP
- Developed
- Grassland
- Intermittent stream/ riparian trees
- Pond
- Shrub-steppe
- Upland trees

Habitat Categories 1 - 6

A1	A2	A3
B1		B3
C1	C2	C3

N
W E
S

0 0.5 1
Kilometers

WEST, Inc.

Figure P-9. Biglow Canyon Wind Project Habitat Analysis Area - 8 of 9.

- Turbine Corridor
- New Facilities - 750-ft Buffer
- New Proposed Transmission Line
- Previous Proposed Transmission Line
- Proposed Collector System
- Access Rds - New or Improved

Met Towers

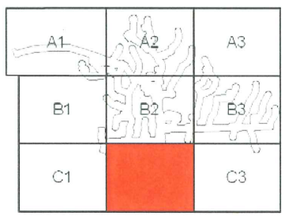
- Permanent
- Temporary

- Proposed Substation
- Previous Proposed Substation
- Proposed BPA substation
- O&M Facility
- Staging Areas

Habitat

- Agriculture
- CRP
- Developed
- Grassland
- Intermittent stream/ riparian trees
- Pond
- Shrub-steppe
- Upland trees

Habitat Categories 1 - 6



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0 0.5 1
Kilometers

WEST, Inc.

ATTACHMENT Q-1

Revised Figure Q-1

Figure Q-1

Threatened and Endangered Species Analysis Area

Biglow Canyon Wind Farm Supplement

ORION ENERGY LLC

Maryhill
Rufus
Biggs Junction
Wasco
84
97
14
206

Legend

- Highway
- Major Road
- Railroads
- Rivers/Lakes
- Proposed Turbine Corridors
- Alternate Turbine Corridor
- 5-mile Threatened and Endangered Species Analysis Area
- John Day Rim Mitigation Area

N
W E
S

0 1 2 3 4
Miles

CH2MHILL

File Path: \\rosa\proj\OrionEnergyLlc\326775\GIS\MapDocuments\EFSC\Supplements\Supl_Figure Q-1 - Threatened and Engangered Species.mxd, Date: March 7, 2006 3:07:30 PM

EXHIBIT Q

Threatened and Endangered Plant and Animal Species

Comment

In a conference call on January 6, 2006, the Department requested clarification on the following items:

1. Discrepancies on the number species listed in the text of Exhibit Q and in Table Q-1, Attachment Q-1.
2. Information regarding the presence of hepatic monkeyflower (*Mimulus jungermannioides*) and disappearing monkeyflower (*Mimulus evanescens*) within a 5-mile radius of the project area.
3. Clarification regarding typographical errors on the spelling of Henderson's ricegrass Laurence's milk-vetch in Table Q-1.
4. Revisions to Section Q.2.2 regarding the search of ORNHIC of USFWS database for documented and potential occurrences of candidate, proposed, and listed species in the analysis area and biological filed surveys conducted in June and August 2005.

Response

The text below provides clarification on the comments noted above:

1. ASC Section Q.1 (Introduction) states, "Nine federal and state listed and candidate wildlife and plant species could exist within the analysis area (Table Q-1, Attachment Q-1), including three bird species, three fish species, and three plant species." The text should read, "Per ONHIC and USFWS data systems searches, 13 federal and state listed and candidate wildlife and plant species could exist within the analysis area (Table Q-1, Attachment Q-1), including three bird species, one mammal species, six fish species, and three plant species. However, field surveys revealed that suitable habitat exists for only six of the thirteen species." Clarification—four plant species are listed in Table Q-1. However, only three of the four have state or federal Endangered Species Act (ESA) listing status (Endangered, Threatened, or Candidate). The Robinson's onion is a federal species of concern with no state status and is therefore not included in an ESA analysis.
2. Records of hepatic monkeyflower (*Mimulus jungermannioides*) and disappearing monkeyflower (*Mimulus evanescens*) occurring within a 5-mile radius of the project area are included in ASC Exhibit P, Attachment P-3. To complement the data included in Attachment P-3, the Applicant also conducted a supplementary ONHIC data search that focused on a 2-mile radius around Facility site and in areas that could be potentially disturbed by construction and operation of the Facility (for example, turbine corridors,

laydown areas). This additional search did not reveal records of these two species occurring at the Facility site, nor did it show species within a 2-mile radius of the Facility area. Both database searches were followed up by field surveys for listed species as noted below. No listed species were observed at the Facility site during two site visits.

3. ASC Table Q-1 requires the following edits: Henderson's ricegrass is ***Achnatherum hendersonii*** not *Achnatherum collinus* var. *laurentii.*

4. ASC Section Q.2.2 requires the following edits: Laurence's milk-vetch is ***Astragalus collinus* var. *laurentii*** not *Astragalus robinsonii* and Henderson's ricegrass is ***Achnatherum hendersonii*** not *Achnatherum collinus* var. *laurentii.*

5. ASC Section Q.2.2 should read, "The ORNHIC database and USFWS database were queried for documented and potential occurrences of candidate, proposed, and listed species in the analysis area. Areas of proposed facilities were surveyed for 2 days in June 2005 and 1 day in August 2005 to document occurrence and habitat of sensitive plant species, including threatened and endangered species. The surveys were conducted by qualified biologists with an understanding of the ecology and habitat of Sherman County. Potential suitable habitat was identified on a map prior to visiting the site and visual surveys were conducted in these areas. In addition, the areas described in the ORNHIC database records also were surveyed."

Additional Information

Supplemental ASC, Figure Q-1 (attached) shows the minor revisions associated with the facilities layout as shown in Figures C-2 and C-2A and discussed in the "Additional Information" subsection of Supplemental ASC, Exhibit C.

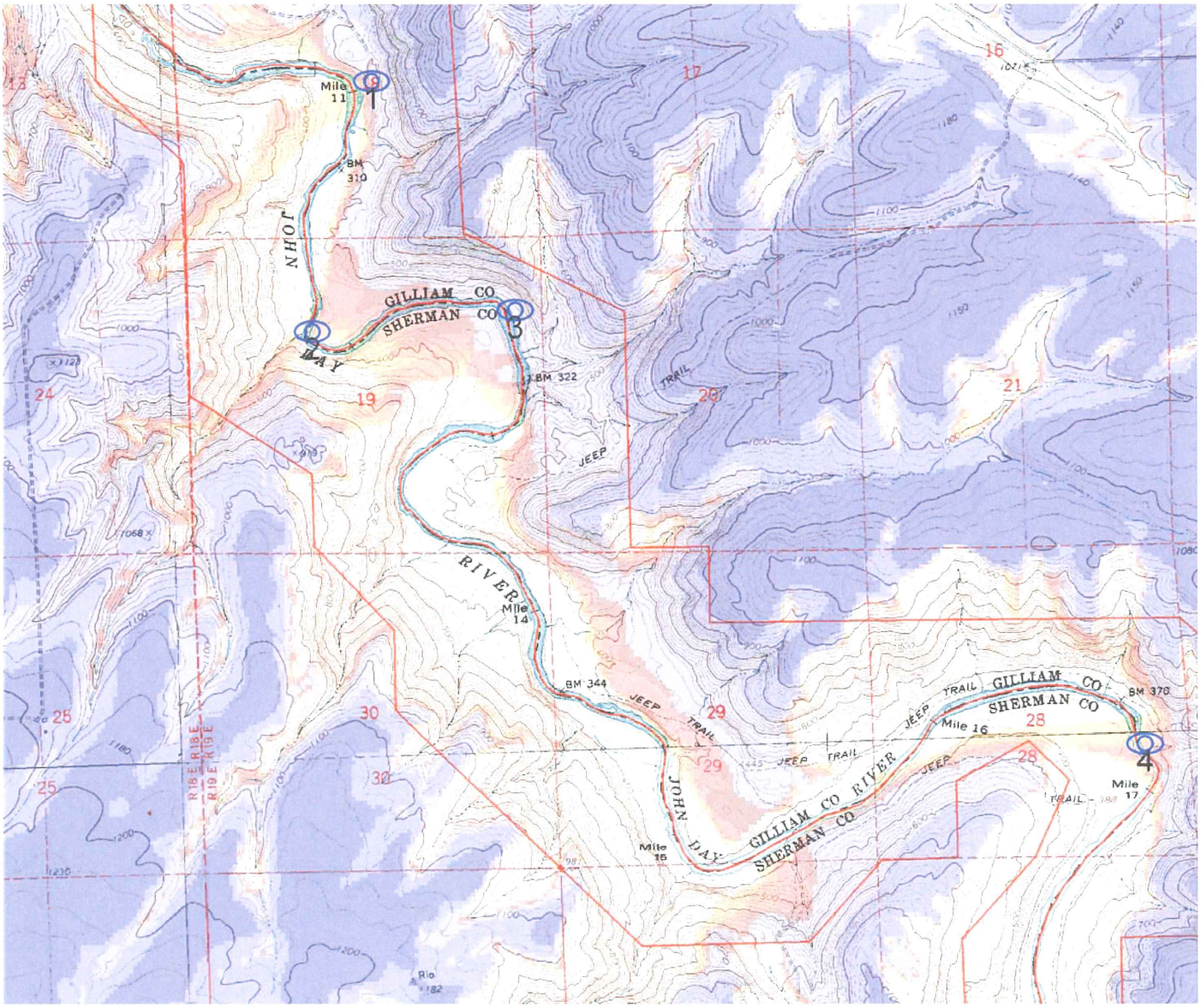
The corridor modification shown in Supplemental ASC, Figure Q-1 represents a smaller disturbance area than the area shown in the ASC. Consequently, impacts to plant and threatened and endangered species habitat actually are less than impacts described in the ASC.

Supplemental ASC, Figure C-2A shows three collector line additions and an Alternate Turbine Corridor near the southern substation location. The habitat of these areas is located entirely in cultivated wheat and developed land. The area surveyed immediately west of the alternate corridor during the original phase of project analysis did not discover any rare plants. Data searches and field surveys indicate that it is highly unlikely that the four listed plants described in ASC Exhibit Q will be found in that area.

See the "Additional Information" subsection and revised maps of Supplemental ASC, Exhibit P for discussion of and visual reference to areas where sensitive species surveys were not conducted.

ATTACHMENT R-1

New Figures R-8 through R-12



- Viewpoint

ZVI (tips visible) :-

- ☐ 0 - 0 turbines
- ☐ 1 - 1 turbines
- ☐ 2 - 2 turbines
- ☐ 3 - 3 turbines
- ☐ 4 - 4 turbines
- ☐ 5 - 20 turbines
- ☐ 21 - 99 turbines
- ☐ 100 - 144 turbines

Figure R-8: Revised ZVI Analysis

WSR variable boundary

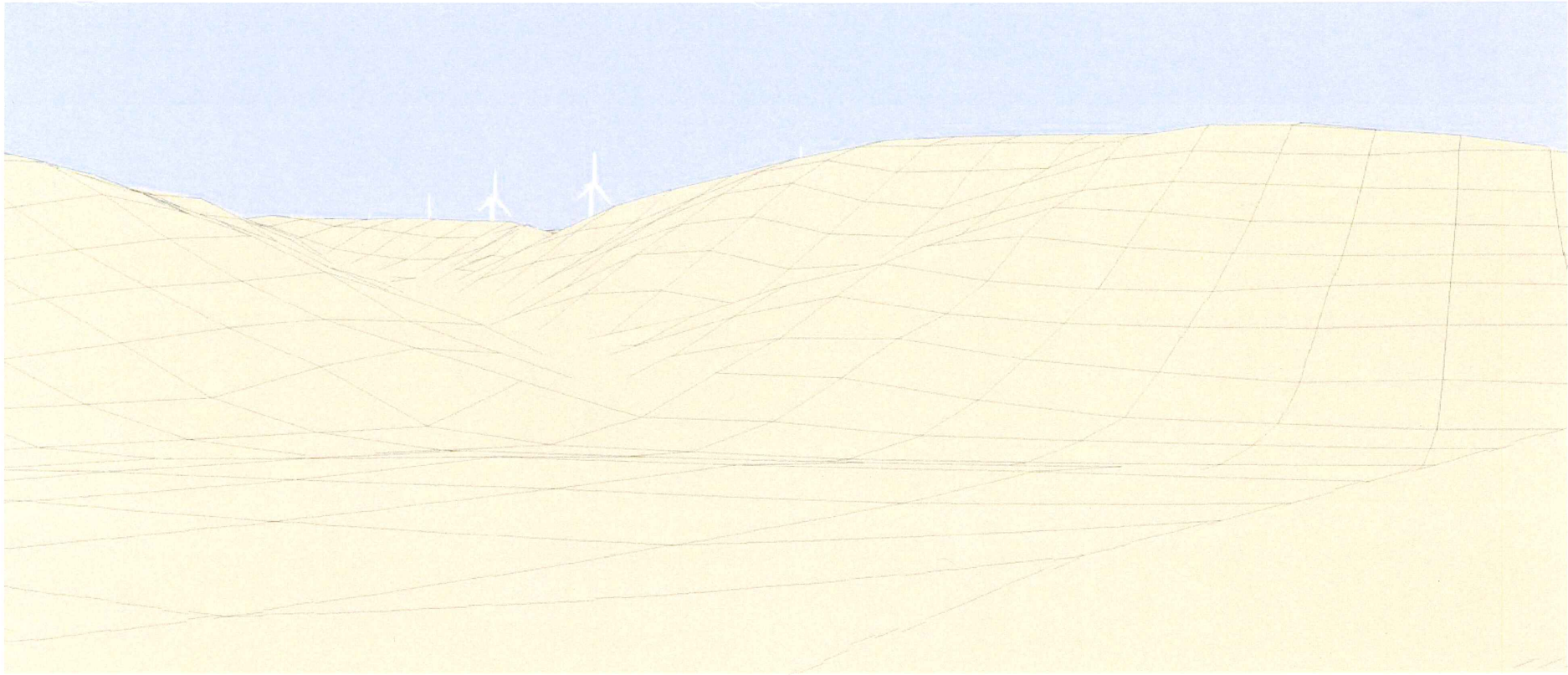


Figure R-9: Biglow Canyon Wind Energy Project
Visualization from John Day River- Viewpoint 1

Coordinate: E 695856, N 5058616, (UTM Zone 10 NAD27)
50mm Objective, 61 degree Field of View

Looking WSW, 5 blade tips are visible, of which 2 hubs are visible
Machine: 100m rotor, 80m hub
Nearest Machine 2.05 km

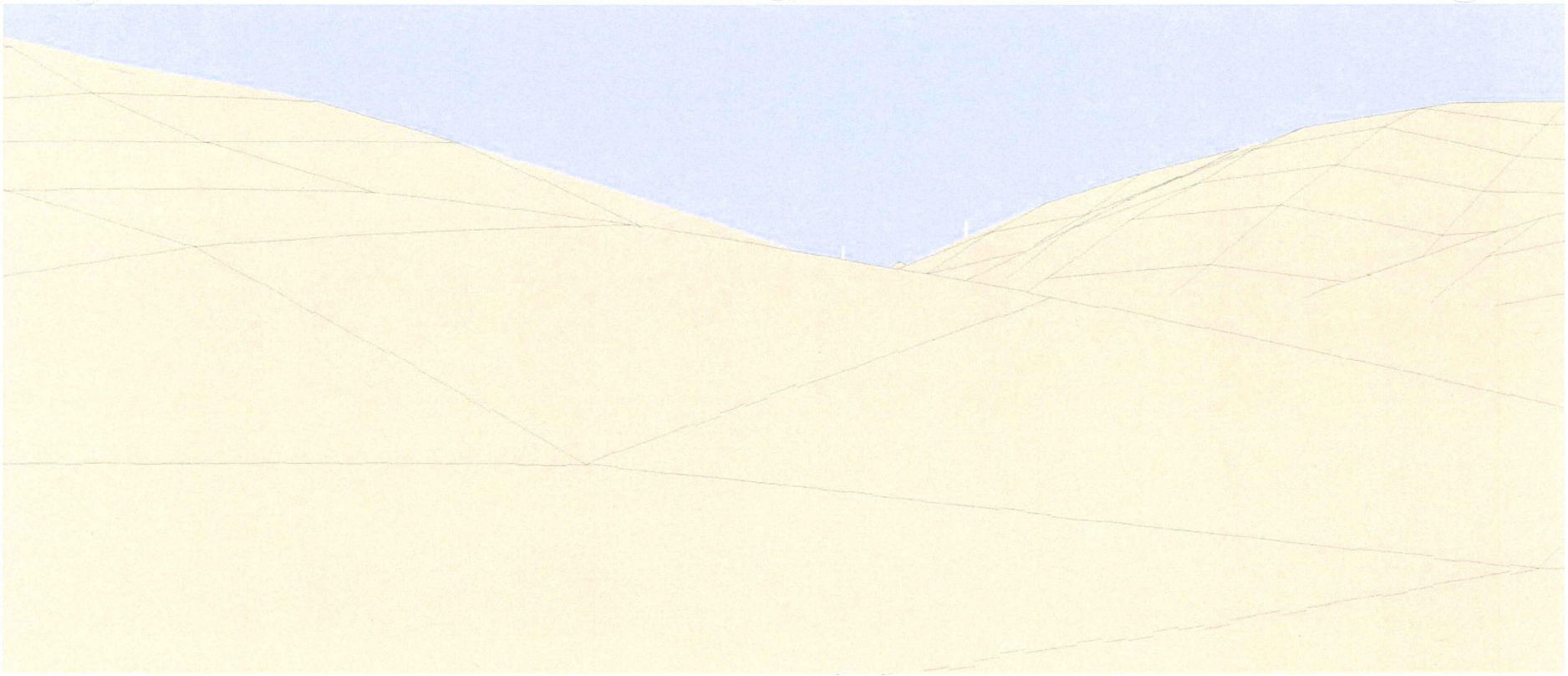


Figure R-10: Biglow Canyon Wind Energy Project
Visualization from John Day River- Viewpoint 2

Coordinate: E 695553, N 5057361, (UTM Zone 10 NAD27)
50mm Objective, 61 degree Field of View

Looking SW, 2 blade tips are visible, of which 0 hubs are visible
Machine: 100m rotor, 80m hub
Nearest Machine 1.67 km

Figure R-11: Biglow Canyon Wind Energy Project
Visualization from John Day River- Viewpoint 3

Coordinate: E 696577, N 5057467, (UTM Zone 10 NAD27)
50mm Objective, 61 degree Field of View

Looking WSW, 8 blade tips are visible, of which 4 hubs are visible
Machine: 100m rotor, 80m hub
Nearest Machine 2.66 km

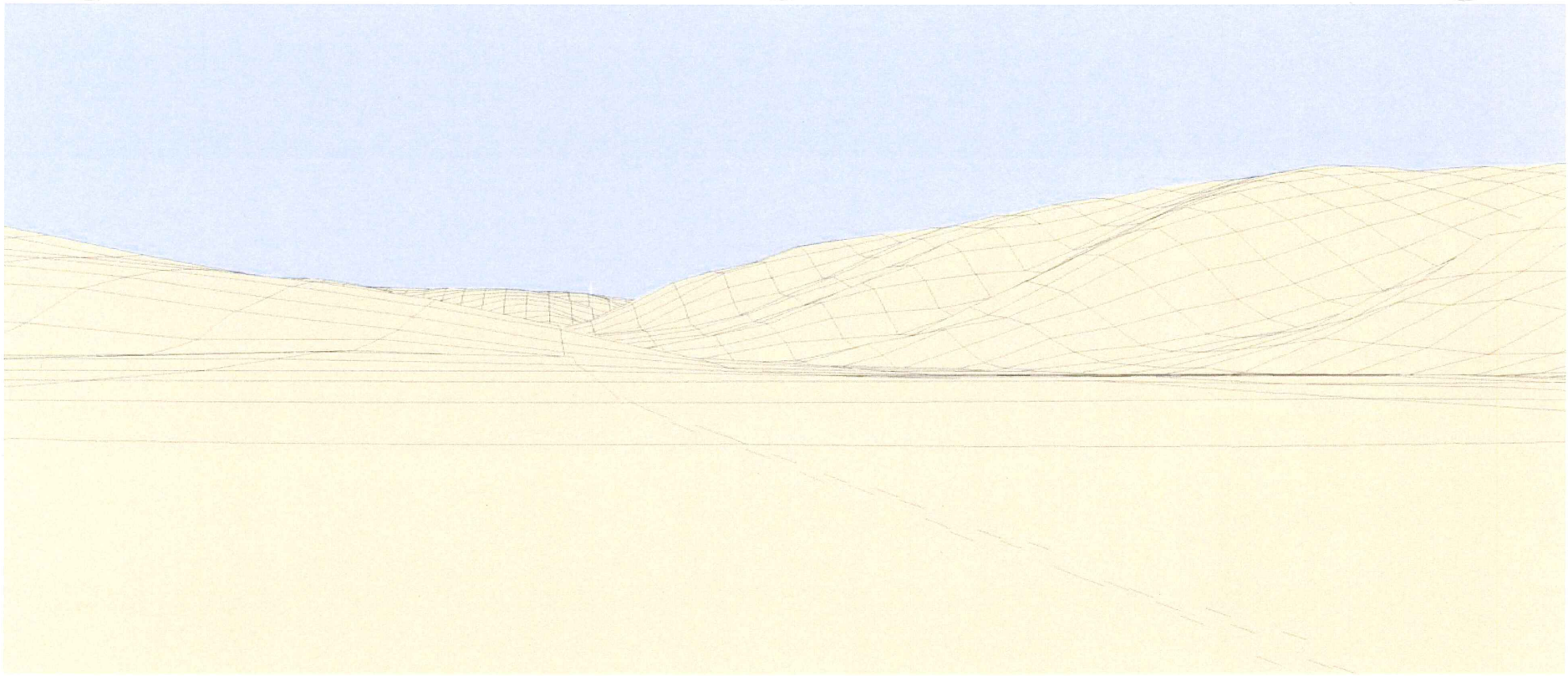


Figure R-12: Biglow Canyon Wind Energy Project
Visualization from John Day River- Viewpoint 4

Coordinate: E 699738, N 5055295, (UTM Zone 10 NAD27)
50mm Objective, 61 degree Field of View

Looking W, 2 blade tips are visible, of which 0 hubs are visible
Machine: 100m rotor, 80m hub
Nearest Machine 5.75 km

EXHIBIT R

Scenic and Aesthetic Values

Comment

In an October 28, 2005, e-mail, the Prineville District BLM requested additional analysis and corrections as follows to Exhibit R to help analyze impacts specific to Wild and Scenic areas:

a. BLM notes the difficulty in using Figure R-3 to determine where along the John Day Wild and Scenic River Biglow turbines would be visible. Please use BLM's suggestion of contrasting colors or another method for clearly depicting locations. In reference to item R.1.c below, please check with BLM about whether the Wild and Scenic River boundaries depicted on Figure R-3 are accurately depicted. The BLM contact is Heidi Mottl at (541) 416-6718.

   Response

   The revised ZVI analysis has been completed and is included in Figure R-8 (attached). The variable Wild and Scenic River Boundaries have been confirmed with Heidi Mottl and are also shown in Figure R-8.

b. Please perform visual simulations to determine how many turbines would be visible from points along the river and what portion of each turbine would be visible, as shown from viewpoints with the greatest impact to visuals. BLM makes reference to the Klondike III Wind Project application, Exhibit R-18 through R-22, as an example of the analysis it requests.

   Response

   BLM has used Figure R-8 (attached) to determine four view points for analysis. Simulations (Figures R-9 through R-12, attached) have been completed and hard copies of all figures (R-8 through R-12) are being sent to the Department and BLM under separate cover.

c. BLM notes that the Federal Wild and Scenic River boundary is not a set distance from the center of the river, but is an identified boundary that varies in width between ¼ mile and 1 mile in the reach between Rivermile 10 and Rivermile 21. (See Plate 1 of the 2001 John Day River Plan Final Management Plan. Final Management Plan.) Please correct the reference on page R-6.

   Response

   Correction noted to page R-6: the Federal Wild and Scenic River boundary is an identified boundary of ¼ to 1 mile, as shown in Figure 8 (attached).

d. BLM notes that recreation use of the John Day Wild and Scenic River canyon between Rivermile 10 and Rivermile 21 is increasing in popularity due to the improved steelhead

fishing in this reach over the past 5 years. In addition to public access via boat and private access via private property, public access is available by foot between the ordinary high water marks, as determined by the State of Oregon in June 2005. Please correct the reference on page R-16.

Response

Correction noted to page R-16 of the ASC.

Additional Information

None of the various modifications described in Exhibit C and shown in Figure C-2A will change the level of impacts to visual resources as originally proposed in Exhibit R of the ASC.

Given the results of ZVI analysis and context of the surrounding landscape, the modifications discussed in Exhibit C of this Supplement are relatively minor and do not constitute a significant visual impact.

EXHIBIT S

Historic, Cultural, and Archaeological Resources

Comment

Please respond to the October 31, 2005, letter from the State Historic Preservation Office in which Lucie Tisdale notes that the archaeological survey methodology employed by CH2M HILL is inadequate. In addition, SHPO also notes the inadequacy of the historic refuse scatter information that needs to be recorded on the correct form.

Response

Adequate survey methods were employed during the archaeological survey at the Facility site, but the text provided in Exhibit S incorrectly described the archaeological survey methods used. CH2M HILL has corrected the description. CH2M HILL also resubmitted the BGW-4 site record (for the historic refuse scatter information) on the proper form. A copy of the corrected description of the archaeological survey methods used at the Facility Site is provided below (the corrected text is in italics).

The cultural resource assessment included a file search at SHPO. Cultural and environmental background and history of the Facility vicinity was researched in order to provide an interpretive context for cultural resources in the Facility area. Literature was reviewed to examine the location and nature of potential Traditional Cultural Properties (TCPs) in the Facility area. An intensive pedestrian inventory (survey) of all wind energy facility areas was also conducted. The study methods employed followed applicable NEPA regulations and were also consistent with U.S. Secretary of Interior Standards for cultural resource survey and documentation under Section 106 of the National Historic Preservation Act. *Turbine string linears were surveyed as 150-meter (~500-foot) study corridors, with 30-meter transect intervals. Transmission line linears were surveyed as 75-meter (~250 foot) study corridors with 30-meter transect intervals. Transportation corridors were surveyed in 60-meter (~200-foot) study corridors with 30-meter transect intervals.* Staging areas and Operations and Maintenance facilities were investigated with buffers of approximately 25 percent to provide for alteration of placement. Surveys were conducted and sites were recorded using hand-held Trimble GPS devices.

Comment

An informal comment was provided by the State Historic Preservation Office regarding potential Project impacts on the Oregon Trail.

Response

Supplemental ASC, Attachment S-1 contains a response to this comment.

Additional Information

The Applicant requested confirmation from the Department that cultural surveys commissioned by BPA will be sufficient to cover the new transmission line routes (revised to be the same as that of the BPA line) proposed by the Applicant. Lucie Tisdale of the State Historic Preservation Office (SHPO) reviewed the survey that Archaeological Investigations Northwest, Inc. (AINW) completed for the BPA line. This study included the site of the relocated transmission line. After reviewing the survey, SHPO came to the following conclusion:

> "After reviewing the survey that Archaeological Investigations Northwest, Inc. (AINW) completed for the BPA study of the Klondike III/Biglow Canyon Wind Integration project it is SHPO's recommendation that an additional survey be completed to cover the difference in distance between the 200' wide study corridor and additional 250' that your company (Orion) is proposing. If Orion decides to use the 200' wide study corridor instead of the 250' wide study corridor then the BPA report is fine. AINW also recommends additional archaeological investigations be completed in those areas that have high probability for cultural resources (i.e., alluvial terraces adjacent to the drainage bottoms) and to further investigate the sites located for the National Register of Historic Places determination." (Email correspondence from Luci Tisdale of SHPO to Carlos Pineda of Orion Energy and Cathy Van Horne of ODOE on February 13, 2006.)

The Applicant has determined that the relocated transmission line and underground collector lines will remain within the 200-foot-wide study corridor surveyed and described in the AINW report. Consequently, the minor changes in the transmission line layout will not impact cultural resources at the Facility site. Furthermore, the relocation of the substation and the minor modifications to the underground collector line layout will not affect cultural resources (see Figure C- 2A). The new location of the substation was previously surveyed during the preparation of the ASC and no cultural resources were reported at the site.

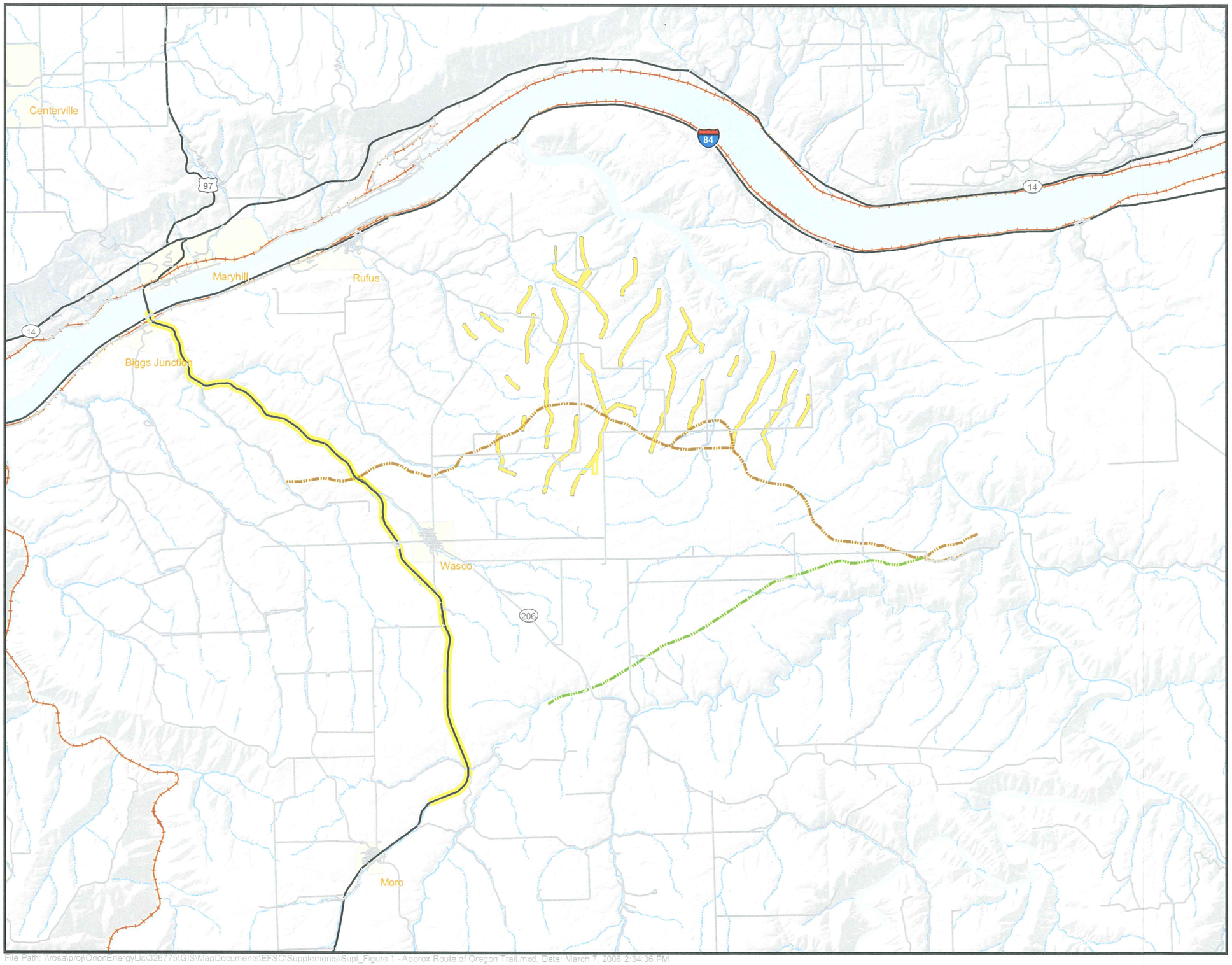
Figure 2 in the Cultural Resources Survey Report (Attachment S-1 to the ASC) also shows the potential creation of an Alternate Turbine Corridor. The southern terminus of the original corridor may be modified and the Alternate Turbine Corridor built instead to avoid potential wake effects from nearby OTWF community wind project turbines that could be located in the area at a future date. The Alternate Turbine Corridor will be surveyed for cultural resources if required by the Department and any survey findings will be provided to SHPO and ODOE.

Figure 1

Approximate Route of Oregon Trail

Biglow Canyon Wind Farm Supplement

ORION ENERGY LLC



Legend

- Journey Through Time Scenic Byway (US 97)
- Oregon Trail (Approx.)
- Barlow Road Cutoff Trail

N
W E
S

0 1 2 3 4
Miles

Source for Oregon Trail Route: 1867 General Land Office Maps. Oregon Trial Identified as Old Emigrant Road and Road to Walla Walla.

CH2MHILL

File Path: \\rosa\proj\OrionEnergyLlc\326775\GIS\MapDocuments\EFSC\Supplements\Supl_Figure 1 - Approx Route of Oregon Trail.mxd, Date: March 7, 2006 2:34:36 PM

ATTACHMENT S-1

Response to State Historic Preservation Office Comment on Oregon Trail

The following analysis is in response to a telephone call regarding the effects of the construction and operation of the proposed Biglow Canyon Wind Farm Facility (Facility) on the Oregon Trail, from Mr. Kirk Ranzetta of the Oregon State Historic Preservation Office to Robin McClintock of CH2M HILL on January 12, 2006.

Oregon Trail

The Oregon Trail is shown to pass through the southern portion of the Facility area and is intersected by several existing roads: Emigrant Springs Road, Oehman Road, and Medler Lane, and six turbine strings as shown on the attached Facility map (Figure 1). In addition, the trail would be intersected by a proposed overhead transmission line between Beacon Road and Oehman Road (Figure 1).

The Facility area has long been under intensive cultivation and each of the areas mentioned above is currently in wheat production. As part of the field investigations, each turbine string was examined for evidence of archaeological and historical cultural resources, including the trail. No physical evidence of the trail was observed during the field investigations. Formerly visible evidence of the trail has probably been obliterated by farming of the area.

Although no evidence of the Oregon Trail was detected in the field surveys of the area, the Oregon Trail alignment is a federal and state designated historic trail. In the unlikely case that intact segments of the trail were discovered at a later date, the Applicant will seek to avoid any adverse impacts to the trail.

EXHIBIT T

Recreational Facilities and Opportunities

This exhibit has not changed.

EXHIBIT U

Public Services/Socioeconomic Impacts

Comment

(Exhibit U, pages U-1 through U-23) Expand Exhibit U to address impacts on public services within the 30-mile analysis area, including impacts on Washington communities.

Response

Orion respectfully submits that impacts on communities in Washington are outside of EFSC jurisdiction. In any case, no fire or police protection is required from Washington communities, and no transportation impacts are expected. There may be a negligible impact on the housing market, with some minor tightening of the market possible during peak construction periods, but given available housing and schools on the Oregon side of the Columbia River, most construction workers are not expected to reside in Washington communities. There will be no significant impact to Washington communities during operations owing to the small amount of permanent project personnel. Thus, further detailed characterization of communities in Washington is not necessary to demonstrate compliance with the Council's standard.

Comment

In a conference call on January 6, 2006, the Department requested further clarification regarding the inclusion of communities in Washington in the analysis area and the potential for impacts to public services in those communities.

Response

The analysis area included communities in Washington such as Goldendale and Dallasport, as well as unincorporated areas within the 30-mile radius of the Facility site. The Applicant's examination of potential impacts on public services provided by communities in Washington followed the same methodology used to determine potential impacts to public services provided by communities in Oregon. This included an Internet search of hotel and motel rooms as well as RV camping sites within the analysis area (Greater Goldendale Chamber of Commerce, www.goldendalechamber.org, 2005; Klickitat County, www.KlickitatCounty.org, 2005).

Given the general availability of temporary housing (there are more than 750 hotel rooms in Oregon alone) as well as permanent housing opportunities in both Oregon and Washington, no significant adverse impacts on the ability of communities to provide housing are anticipated from Facility construction or operations. In addition, no significant impacts to traffic volumes are anticipated. Workers who may reside in Washington would likely commute to the Facility via Highway 14 and Highway 97. Both highways have substantial traffic volumes in Washington and the number of workers potentially commuting to the Facility site would be insignificant in comparison to the volume of existing traffic.

EXHIBIT V

Waste Minimization

This exhibit has not changed.

ATTACHMENT W-1

Revised Contractor Bid for Decommissioning

Blattner

D.H. Blattner & Sons, Inc.
400 County Road 50
Avon, MN 56310-8661
P: 320-356-7351
F: 320-356-7392
www.dhblattner.com

12/19/05

Mr. Pineda
Orion Energy LLC
1611 Telegraph Ave, Suite 1515
Oakland, CA 94612

RE: Sherman County Decommissioning Proposed Quantities

Mr. Pineda,

Blattner submits the following proposal for the removal of the Wind Turbine Generators, towers and foundations at the Sherman County wind Project.

The wind turbines and all auxiliary equipment associated with it shall be removed for salvage purposes and will be retained by the contractor. The foundation pads will be exposed to a depth of three (3) feet. Foundation slabs, walls, and bolts will be removed to a depth of three (3) feet below present grade. The transformer pads will be removed in their entirety including conduits to a depth of three (3) feet. Associated underground cable will be removed to extent possible, not exceeding three (3) feet. The foundation sites and roads will be graded to match the surrounding contours. All disturbed areas will be reseeded if topsoil is present at the site. The overhead lines foundations will be removed to a depth of three (3) feet and the poles and conductor removed for salvage.

Price

225 GE 1.5 MW, 80 Meter tower	$ 9,905,953*
150 GE 3X MW, 80 Meter tower	$10,206,899*

Unit Price

500kv Overhead Line	$ 73,000* per mile
230kv Overhead Line	$ 56,000* per mile
34.5kv Overhead Line	$ 28,000* per mile

*Value is based on 2005 dollar; no adjustments or predictions have been made for labor or equipment escalations for the time of actual decommissioning.

Please find the enclosed documents for inclusions, assumptions, and pricing information.
If you have any questions, please feel free to contact me at (320)-356-2351.

Respectfully,

Nik Maeder
D.H. Blattner and Sons, Inc.

EXHIBIT W

Facility Retirement and Site Restoration

Comment

(Exhibit W, Section W.3, page W-2) Provide support for the estimated value of scrap steel. Ensure that the value of scrap steel applied as a credit to the retirement cost estimate is FOB curbside, site of demolition, or that the value takes into account the offsetting cost of moving the scrap steel to a suitable outlet.

Response

Please see Exhibit W of the ASC for support for scrap steel prices, estimated conservatively to include the last 4 years. Using historical rather than current scrap steel prices is conservative because current prices are relatively high.

Comment

(Exhibit W, Attachment W-1) Provide a retirement cost estimate showing the cost of removing the alternative 3-mile and 7-mile overhead transmission lines.

Response

Please find with this supplemental ASC a revised Attachment W-1, including the cost of removing 230-kV and 500-kV transmission lines, as well as 34.5-kV overhead collector lines.

Comment

(Exhibit W, Attachment W-1) Address retirement of the collection system, including all underground and above ground segments.

Response

Aboveground collector lines will be removed, the cost of which is included in Supplemental ASC, Attachment W-1. Consistent with landowner leases, below-ground collector lines will not be removed, as they will be buried greater than 3 feet below ground.

EXHIBIT X

Noise

Comment

The Department understands that Orion is confident it will be able to obtain landowner waivers, as required, to show compliance with the noise standard. However, to enable the Department to recommend to the Council that it find the facility would meet the noise standard, please provide information about how Orion would modify the facility in the event it were unable to obtain necessary waivers.

Response

If an applicant like Orion submits landowner statements of willingness to negotiate noise waivers, the Council may legally find Orion's compliance with the noise standard is feasible, and accordingly may issue a site certificate simply requiring submission of all required waivers prior to commencement of construction. This would place the risk of not getting the waivers on Orion, not the State. In Orion's opinion, that concludes the matter.

It should be noted that Orion intends to submit all noise waivers, or as many as can be obtained given limited staff resources, prior to the Draft Proposed Order in this proceeding. Further, in response to ODOE's request, Orion offers the following sketch of its options. First, Orion's preferred approach in each case is to obtain a waiver. Second, if a waiver cannot be obtained for a given noise sensitive receptor, Orion will revise the layout within the relevant turbine corridor, with no reduction in turbines as originally modeled, so as to achieve compliance with the ambient degradation standard. If this second path is followed, Orion will submit to ODOE its revised modeling showing why the revised layout complies with the noise standard; this will be one of several pre-construction submissions to ODOE and will not require any further action by the Council (it is assumed the Council will have approved the modeling methodology in its issuance of the site certificate). Third and finally, if a waiver cannot be obtained and if revising the layout within a turbine corridor cannot achieve compliance, then one or more turbines that were in the original site layout will not be built. If the third path is followed, again, revised modeling will be submitted to ODOE before construction.

Additional Information

With the exception of the revised transmission line and substation, the preliminary layout shown in ASC Figures X-1 and X-2 has not changed. The 36-dB(A) and 50-dB(A) contours shown in ASC Figures X-1 and X-2 also remain unchanged.

The Applicant has provided certain technical data to Kerri Standlee, Department noise consultant. The data will form part of the "statement of findings" by Mr. Standlee.

EXHIBIT Y

Carbon Dioxide Emissions

This exhibit has not changed.

EXHIBIT Z

Cooling Towers

This exhibit has not changed.

ATTACHMENT AA-2

Revised Figure AA-1

Figure AA-1

Structures within 200 Feet of 34.5-kV Underground Collector Circuits

Biglow Canyon Wind Farm Supplement

ORION ENERGY LLC

Legend

- Houses within 200 feet of Underground Collectors
- Proposed Met Tower
- Proposed Facility Access Roads
- Existing Paved Roads
- Existing Highways
- Proposed 34.5-kV Underground Collector System
- BPA Proposed Transmission Line
- Orion Proposed Transmission Line
- Existing Transmission Line
- Proposed Turbine Corridors
- Alternate Turbine Corridor
- Proposed Staging Areas
- Existing Substation
- Proposed Substation / Proposed O&M Facility
- Proposed O&M Facility
- Streams

N
W E
S

0 0.5 1 1.5 2
Miles

CH2MHILL

Source:
Map created using the following USGS, 7.5-Minute Quad Maps: Klondike (1971), Quinton (1976), Rufus (1971), and Wasco (1987)

File Path: \\rosa\proj\OrionEnergyLlc\326775\GIS\MapDocuments\EFSC\Supplements\Supl_Figure AA-1 - Structures Within 200-ft of Underground Collectors.mxd, Date: March 7, 2006 2:36:30 PM

ATTACHMENT AA-1

Exhibit AA2, Electric Transmission Line

EXHIBIT AA2

ELECTRIC TRANSMISSION LINE

OAR 345-021-0010(1)(aa)
OAR 345-024-0090(1)
OAR 345-024-0090(2)

TABLE OF CONTENTS

FIGURES (located after text)

ATTACHMENT

AC Electric and Magnetic Field Analysis

AA.1 INTRODUCTION

OAR 345-021-0010(1)(aa) *If the proposed facility includes an electric transmission line:*

This is a supplemental submittal.

The original application addresses the only transmission line options for this project. These transmission line options include only 230-kV and 500-kV designs.

The 34.5-kV collection circuits are distribution lines. However, to answer the EFSEC staff review request for specific information pertaining to the planned 34.5-kV overhead collection circuits, the following heading titles of Sections AA.2 and AA.3 are repeated here to allow a parallel treatment of Electric and Magnetic Fields for the 34.5-kV overhead collection circuits. Where "Transmission Line(s)" appears in the section title text, please read "Overhead 34.5-kV Collection Circuit(s)".

This supplemental submittal addresses 34.5-kV overhead collection lines, although depending on Facility build-out and final site layout, the Facility may not use these lines. Overhead 34.5-kV collection lines make economic sense if a large project is going to be built out at one time and circuits from a series of turbine corridors make "home-runs" to the Facility substation.

AA.2 ELECTRIC AND MAGNETIC FIELDS

(A) Information about the expected electric and magnetic fields, including:

AA.2.1 Distance from Transmission Line Center Line to Edge of Right-of-Way

(i) The distance in feet from the proposed center line of each proposed transmission line to the edge of the right-of-way;

Response:

For the overhead 34.5-kV collector circuits, the distance between the centerline of the 34.5-kV circuits and the edge of the right-of-way is undefined, because the entire wind farm is leased as right-of-way for the collection circuits.

AA.2.2 Types of Occupied Structures within 200 Feet of Center Line of Proposed Transmission Lines

(ii) The type of each occupied structure, including but not limited to residences, commercial establishments, industrial facilities, schools, daycare centers, and hospitals, within 200 feet on each side of the proposed center line of each proposed transmission line.

Response:

Because the wind farm is so rural and sparsely populated, it is anticipated that there will be few, if any, occupied buildings of any sort, within 200 feet of the overhead 34.5-kV circuits. However, the overhead 34.5-kV collection circuit locations are not determined at this time because the final turbine site layout has not yet been determined. The

location of the overhead 34.5-kV circuits and their possible proximity to occupied structures will be provided at that time.

AA.2.3 Distance from Proposed Center Lines to Structures

(iii) The approximate distance in feet from the proposed center line to each structure identified in (A);

Response: The approximate distance from the proposed centerline of sections of the overhead 34.5-kV collection circuit to structures, and the nature of those structures, will be provided when the final turbine site layout is selected.

AA.2.4 Graphs of Electric and Magnetic Field Levels

(iv) At representative locations along each proposed transmission line, a graph of the predicated electric and magnetic fields levels from the proposed center line to 200 feet on each side of the proposed center line;

Response:

AA.2.4.1 Generation of Electric and Magnetic Fields (EMF)

This section addresses the estimates of the maximum possible 60-Hz AC electric and magnetic field strengths that will be produced by the proposed 34.5-kV overhead collector circuits. These estimates are computed for a height of 1 meter (3.3 feet) above the ground on the proposed line routes.

AA.2.4.2 EMF Calculations for the Single-Circuit 34.5-KV Overhead Collection Lines

For this facility, EMF exposure risk is very low because the line will pass over and through undeveloped land. Single-circuit 34.5-kV overhead line construction will use single wood poles with the conductors configured in a triangle on horizontal post insulators. This conductor configuration produces relatively low electric and magnetic fields, compared to other design options, and further reduction is not economically practical.

The conductor arrangement proposed for the single-circuit 34.5-kV overhead collection construction system consists of one conductor per phase (a total of 3 wires) and one fiber optic shield wire.

Figure AA2-1 illustrates the typical structural configuration proposed for the 34.5-kV overhead single-circuit facilities.

AA.2.4.3 EMF Calculations for the 34.5-kV Overhead Double-Circuit Collection Lines

It is functionally and economically practical to construct two circuits on the same pole line. For this Facility, EMF exposure risk is relatively low because the line will pass over and through undeveloped land. The conductor arrangement proposed for double-circuit 34.5-kV overhead collection lines consists of two, 3-phase, 34.5-kV circuits, with a single

conductor per phase (a total of 6 wires) and one fiber optic shield wire. Figure AA2-2 illustrates the configuration proposed for the 34.5-kV overhead, double-circuit, collection lines. This geometry and the load current flowing in the conductors, determine the ground-level magnetic field intensity across the corridor.

AA.2.4.4 Line Loads for EMF Calculation

The overhead single-circuit and double-circuit 34.5-kV lines in this study are rated for a nominal voltage of 34.5-kV measured between conductors. Nominal voltage measured between any conductor and ground is 19.9 kV. The line loading value, assumed for all overhead 34.5-kV circuits, is 50 MVA, or 837 amperes per conductor, at peak system load. This value was used in the EMF study.

AA.2.4.5 Calculation Methods

These calculations used the same method and software tool as used in the original submittal. Although the actual legal right-of-way easement for the overhead 34.5-kV lines is undefined, a corridor width of 400 feet is used in the calculations that follow.

AA.2.4.6 Results of EMF Calculations

34.5-kV Overhead Single-Circuit Lines

Table AA2-1 summarizes the calculated values of the magnetic and the electric field values for the proposed 34.5-kV overhead single-circuit and double-circuit lines, at the centerline, and at left and right edges, of the 400-foot-wide corridor. These field values are the result of the projected maximum currents during peak load, and for minimum conductor ground clearances. The actual magnetic field values vary, as load varies daily, seasonally, and as conductor sag changes with ambient temperature. The levels shown represent the highest magnetic fields expected for the proposed project. Average fields along the ground, between poles, and over a year's time, would be considerably less than the peak values shown.

Table AA2-1 Calculated Maximum Magnetic and Electric Field Values

Pole Figure	Voltage	Magnetic Field (mGauss)			Electric Field (KV/M)		
		Left R/W (200')	Max. on R/W	Right R/W (200')	Left R/W (200')	Max. on R/W	Right R/W (200')
AA2-3	34.5-kV Single Circuit	1.2	82.6	1.2	0.003	0.25	0.003
AA2-4	34.5-kV Double-Circuit	2.8	143.7	2.8	0.007	0.705	0.007

As shown in Table AA2-1, magnetic field and electric field values are higher on the corridor than at the edges of the corridor.

These results are plotted on graphs and included here.
For Pole Figure AA2-1, see Figure AA2-3M for the magnetic field profile, and Figure AA2-3E for the electric field graph.

For Pole Figure AA2-2, see Figure AA2-4M for the magnetic field profile, and Figure AA2-4E for the electric field graph.

The attachment that follows this exhibit includes the complete output data from these calculations.

AA.2.5 Measures Proposed to Reduce Electric or Magnetic Field Levels

(v) Any measures the applicant proposes to reduce electric or magnetic field levels;

Response: For the 34.5-kV overhead single-circuit lines, no measures are proposed to reduce electric or magnetic fields because the conductor configuration is already optimized to mitigate the electric and magnetic fields.

For the 34.5-kV overhead double-circuit lines, no measures are proposed to reduce electric or magnetic fields for the following reasons:

- The lands over which the lines cross are rural and agricultural. The alignment is not determined at this time, however it is likely that there will be no nearby residences.
- Mitigating construction would involve the transposing of conductors on the poles to increase the cancellation of fields. This is sometimes done for high-voltage transmission lines where operation practices allow. This practice is not recommended for distribution lines because distribution lines have many more tap connections. For the 34.5-kV overhead lines, conductors will be arranged with a consistent phase position on each pole. For example. It is common practice, for distribution circuits, to make both sides of a double circuit pole identical: A-phase on top, B-phase in the middle, and C-phase on the bottom. If the phase positions are

jumbled to mitigate fields, then each electrical connection must take this into account. Because it can be expected that workmen will usually make the assumption of consistent phase positions, mistakes could happen, regardless of the addition of labels and caution signs.

- Further ground-level reductions of EMF are possible only by increasing conductor ground clearances. However, taller poles will increase construction costs by more than 5 percent.

AA.2.6 Assumptions and Methods Used in Electric and Magnetic Field Analyses

(vi) The assumptions and methods used in the electric and magnetic field analysis, including the current in amperes on each proposed transmission line; and

Response: See response *(iv)*. In addition, the Attachment to this exhibit shows data inputs and assumptions used in the electric and magnetic field analysis. The BPA Corona and Field Effects (Version 3) program was used.

AA.2.7 Monitoring Program

(vii) The applicant's proposed monitoring program, if any, for actual electric and magnetic field levels;

Response: No program for monitoring actual electric and magnetic field levels is proposed at this time.

AA.3 ALTERNATE METHODS

(B) An evaluation of alternate methods and costs of reducing radio interference likely to be caused by the transmission line in the primary reception area near interstate, U.S., and state highways;

Response:

AA.3.1 Radio and TV Interference Generation

The overhead 34.5-kV single-circuit and double-circuit collection system lines are not in the vicinity of Interstate and State Highways.

Power lines, such as the ones proposed here, operating at 34.5-kV in a clean environment, do not cause measurable or problematic foul-weather corona noise. This is because the conductors are of sufficient diameter and spacing, and the electrical voltage gradient on water droplets is too low to ionize the surrounding air.

AA.3.2 RI and TVI Calculations

Because Radio and TV interference cannot be generated by the proposed 34.5-kV collection system facilities, calculations would be meaningless and are therefore unnecessary.

AA.4 ALTERNATING CURRENT FIELDS

OAR 345-024-0090(1) *Can (the applicant) design, construct, and operate the proposed transmission line so that alternating current electric fields do not exceed 9 kV per meter at one meter above the ground surface in areas accessible to the public;*

Response: The electric field on the corridor of the proposed 34.5-kV single-circuit and double-circuit lines do not exceed 9 kV per meter. In fact, the Electric field does not exceed 0.705 kV per meter. See Figures AA2-3E and AA2-4E.

AA.5 INDUCED CURRENTS

OAR 345-024-0090(2) *Can (the applicant) design, construct, and operate the proposed transmission line so that induced currents resulting from the transmission line and related or supporting facilities will be as low as reasonably achievable;*

Response:

AA.5.1 Induced Voltage Phenomena

The proposed overhead 34.5-kV single-circuit and double-circuit collection system lines will have low electric fields at ground level (less than 1 kV/m) and are not expected to cause induced voltage concerns for wire livestock fences with steel fence posts, even where not purposefully bonded to ground rods.

AA.5.2 Induced Current Phenomena

A current-carrying conductor will induce a current to flow in another conductor that is parallel to it. Induced currents result from the net AC magnetic field. Grounded fences create electrical loops in which induced currents can flow. The value of the induced current depends upon the magnetic field strength, the fencing material, and the soil resistance.

Induced currents are not hazardous to people because almost no voltage is involved.

AA.5.2.1 Induced Current from the Proposed 34.5kV Overhead Transmission Line

Table AA2-1 indicates that the average electric field is greatest for the double-circuit 34.5-kV lines, and is 0.705 kV per meter at a location near the corridor centerline. This value is significantly lower than the recommended maximum value of 9 kV per meter. Therefore, the potential hazard is much less than it would be at 9-kV per meter, and are not considered to be significant.

Even though induced voltage concerns are not anticipated, the applicant intends to provide appropriate grounding of fences that parallel the line where appropriate, or where needed to satisfy a landowner's concern. Also, any metal-roofed buildings in proximity to the line will be similarly grounded if necessary to mitigate a perceived concern. This grounding practice is commonly done for high-voltage transmission lines to mitigate the shock hazard associated with the induced voltage. It is seldom if ever

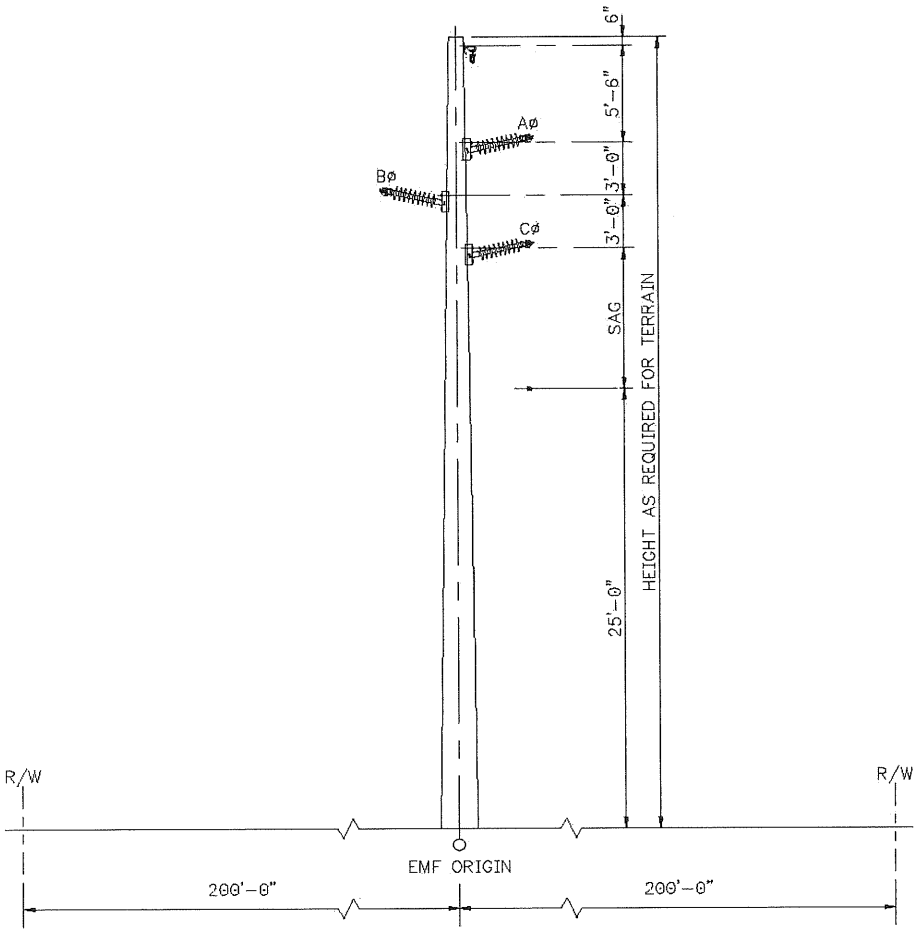
done for fences or buildings in the proximity of overhead distribution lines of 34.5-kV and lower.

AA.6 CONCLUSION

Based on the above information, the Applicant has satisfied the required OAR 345-021-0010(1)(aa), and the Council may find that the standard contained in OAR 345-024-0090 has been satisfied.

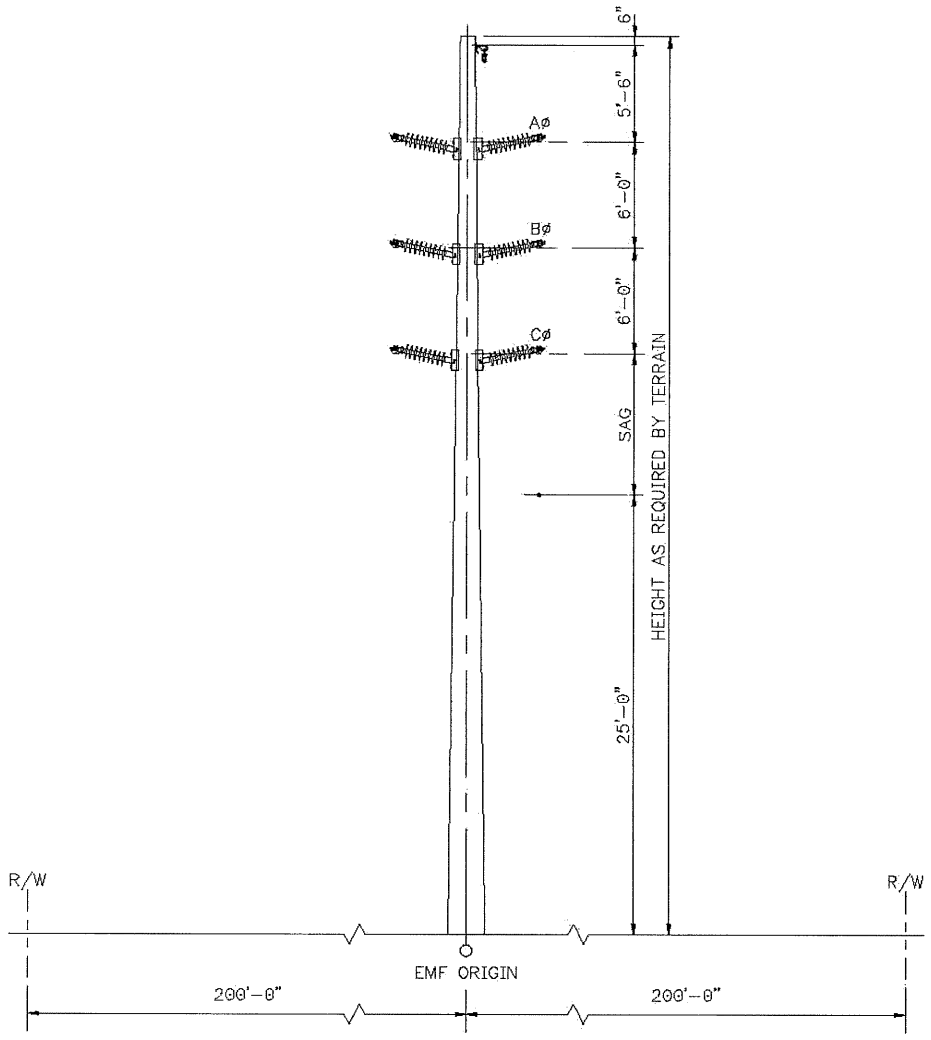
AA.7 REFERENCES

EPRI. 1987. Transmission Line Reference Book, 345-kV and Above. Second Edition revised. Publication No. EL-2500, Electric Power Research Institute, Palo Alto



250' RULING SPAN, 300' MAX. SPAN

FIGURE AA2-1 – TYPICAL 34.5-KV OVERHEAD SINGLE-CIRCUIT CONFIGURATION



250' RULING SPAN, 300' MAX. SPAN

FIGURE AA2-2 – TYPICAL 34.5-KV DOUBLE-CIRCUIT CONFIGURATION

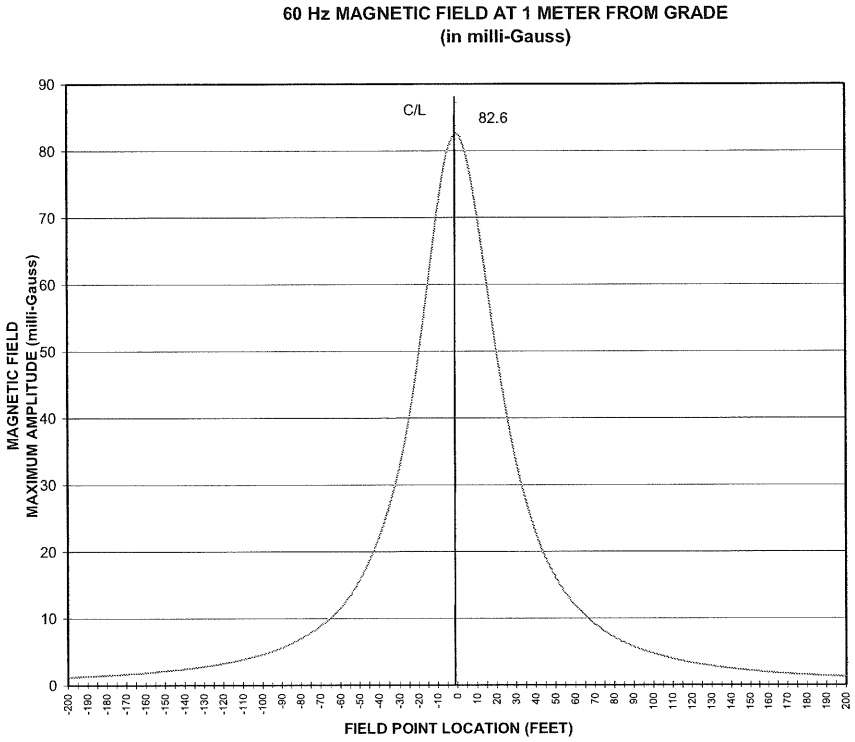


Figure AA2-3M 34.5-kV Overhead Single-Circuit Magnetic Field Profile

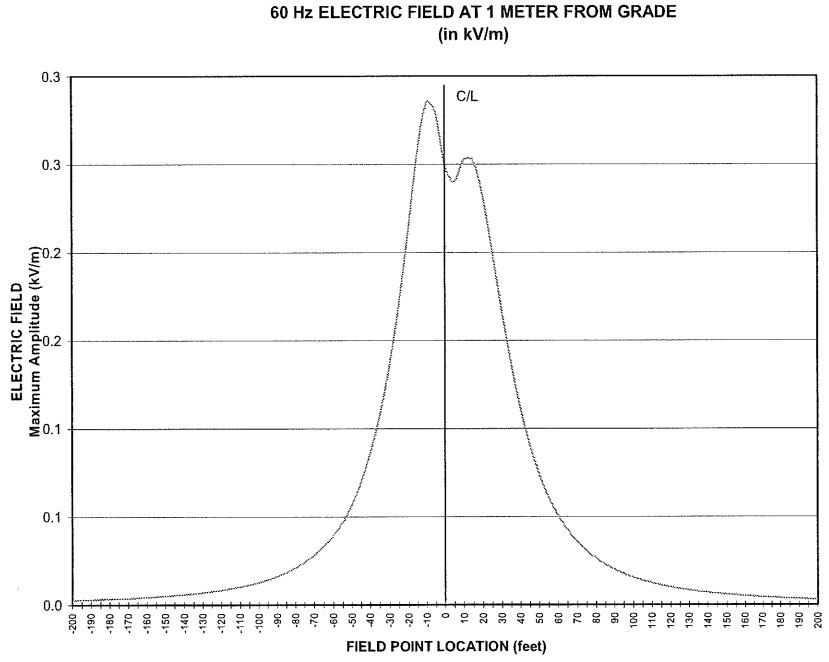


Figure AA2-3E 34.5-kV Overhead Single-Circuit Electric Field Profile

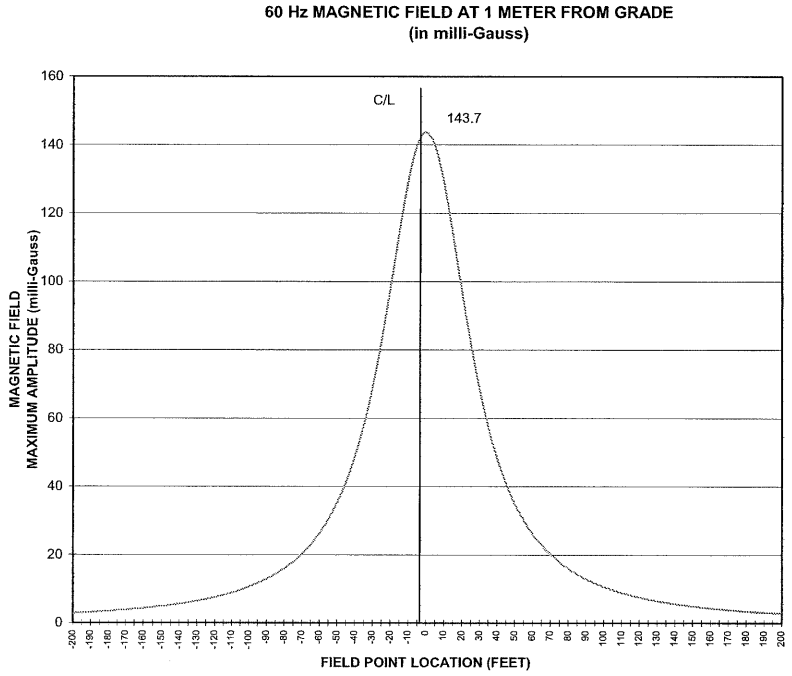


Figure AA2-4M 34.5-kV Overhead Double-Circuit Magnetic Field Profile

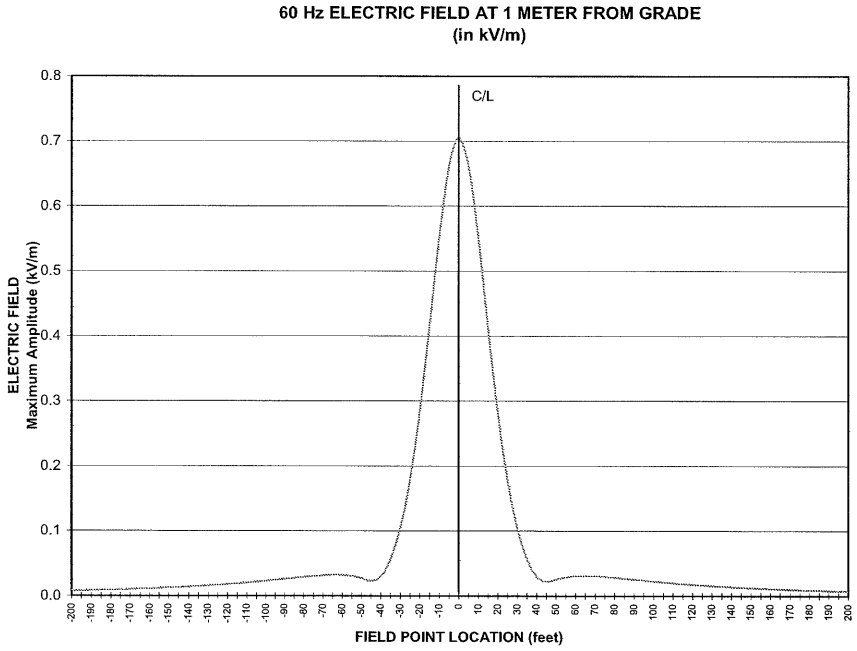


Figure AA2-4E 34.5-kV Overhead Double-Circuit Electric Field Profile

ATTACHMENT TO EXHIBIT AA2

AC Electric and Magnetic Field Analysis Data

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ÛßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßÛ
Û       C O R O N A   A N D   F I E L D        Û
Û E F F E C T S   P R O G R A M   V E R.  3    Û
Û   Source: Bonneville Power Administration    Û
ÛÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÛ
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INPUT DATA LIST

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               12/19/2005          11:52:56
****************** BIGLOW CANYON WIND FARM*************
FIGURE 1 35-KV SINGLE CIRCUIT SHIELDED 954 ACSR RAIL 50MW-837A PER PHASE
1,0, 3, 4,0.0,   2.00,   1.00,    .00

(ENGLISH UNITS OPTION)

(GRADIENTS ARE COMPUTED BY PROGRAM)

PHYSICAL SYSTEM CONSISTS OF  4 CONDUCTORS, OF WHICH  3 ARE ENERGIZED PHASES

OPTIONS: 'COMB'
  5.000,  5.000, 10.000,    .000,  1.000, 75.000,  3.280,  2.000,  3.280
'CIR1-A  ','A',   -4.50,   31.00, 1,   1.165,    .000,  23.000,     .000,     .837,     .000
'CIR1-B  ','A',    4.50,   28.00, 1,   1.165,    .000,  23.000,-120.000,     .837,     .000
'CIR1-C  ','A',   -4.50,   25.00, 1,   1.165,    .000,  23.000, 120.000,     .837,     .000
'SH-1    ','A',     .75,   37.00, 1,    .385,    .000,    .000,     .000,     .000,     .000
 41 -200.0    5.0
 40    5.0    5.0
  0     .0     .0
1COMBINED OUTPUT OF AUDIBLE NOISE, RADIO NOISE, TVI, OZONE CONCENTRATION, GROUND GRADIENT AND MAGNETIC FIELD
****************** BIGLOW CANYON WIND FARM*************
FIGURE 1 35-KV SINGLE CIRCUIT SHIELDED 954 ACSR RAIL 50MW-837A PER PHASE
```

	DIST. FROM CENTER OF TOWER (FEET)	HEIGHT (FEET)	MAXIMUM GRADIENT (KV/CM)	SUBCON DIAM. (IN)	NO. OF SUBCON	SUBCON SPACING (IN)	VOLTAGE L-N (KV)	PHASE ANGLE (DEGREES)	CURRENT (kAmps)	CORONA LOSSES (KW/MI)
CIR1-A	-4.50	31.00	3.14	1.16	1	.00	23.00	.00	.84	.000
CIR1-B	4.50	28.00	2.92	1.16	1	.00	23.00	-120.00	.84	.000
CIR1-C	-4.50	25.00	3.13	1.16	1	.00	23.00	120.00	.84	.000
SH-1	.75	37.00	.62	.38	1	.00	.00	.00	.00	.000

AN MICROPHONE HT.= 5.0 FT, RI ANT. HT.= 5.0 FT, TV ANT. HT.= 10.0 FT, ALTITUDE=   .0 FT
RI FREQ= 1.000 MHZ, TV FREQ= 75.000 MHZ, WIND VEL.(OZ)= 2.000 MPH, GROUND CONDUCTIVITY =   2.0 MMHOS/M
E-FIELD TRANSDUCER HT.= 3.3FT, B-FIELD TRANSDUCER HT.= 3.3FT

LATERAL DIST FROM REFERENCE (FEET)	AUDIBLE NOISE (RAIN) L50 DBA	AUDIBLE NOISE (FAIR) L50 DBA	RADIO INTERFERENCE (RAIN) L50 DBUV/M	RADIO INTERFERENCE (FAIR) L50 DBUV/M	TVI TOTAL RAIN DBUV/M	OZONE FOR RAIN RATE OF 1.00 IN/HR AT 0. FT LEVEL PPB	ELECTRIC FIELD KV/M	MAGNETIC FIELD GAUSS
-200.0	-46.4	-71.4	-46.5	-63.5	-76.2	.000000	.003	.00121
-195.0	-46.3	-71.3	-46.2	-63.2	-75.9	.000000	.003	.00127
-190.0	-46.1	-71.1	-45.8	-62.8	-75.7	.000000	.003	.00134
-185.0	-46.0	-71.0	-45.5	-62.5	-75.5	.000000	.003	.00141
-180.0	-45.9	-70.9	-45.2	-62.2	-75.2	.000000	.003	.00149
-175.0	-45.7	-70.7	-44.8	-61.8	-75.0	.000000	.004	.00157
-170.0	-45.6	-70.6	-44.4	-61.4	-74.7	.000000	.004	.00167
-165.0	-45.4	-70.4	-44.1	-61.1	-74.5	.000000	.004	.00177
-160.0	-45.3	-70.3	-43.7	-60.7	-74.2	.000000	.004	.00187
-155.0	-45.1	-70.1	-43.2	-60.2	-73.9	.000000	.005	.00199
-150.0	-45.0	-70.0	-42.8	-59.8	-73.6	.000000	.005	.00213
-145.0	-44.8	-69.8	-42.4	-59.4	-73.3	.000000	.005	.00227
-140.0	-44.6	-69.6	-41.9	-58.9	-73.0	.000000	.006	.00243
-135.0	-44.4	-69.4	-41.4	-58.4	-72.7	.000000	.006	.00261
-130.0	-44.3	-69.3	-40.9	-57.9	-72.4	.000000	.007	.00280
-125.0	-44.1	-69.1	-40.3	-57.3	-72.0	.000000	.008	.00302
-120.0	-43.9	-68.9	-39.8	-56.8	-71.7	.000000	.008	.00327
-115.0	-43.7	-68.7	-39.2	-56.2	-71.3	.000000	.009	.00354
-110.0	-43.4	-68.4	-38.5	-55.5	-70.9	.000000	.010	.00386
-105.0	-43.2	-68.2	-37.8	-54.8	-70.5	.000000	.011	.00421
-100.0	-43.0	-68.0	-37.1	-54.1	-70.1	.000000	.013	.00462
-95.0	-42.7	-67.7	-36.4	-53.4	-69.6	.000000	.014	.00508
-90.0	-42.5	-67.5	-35.6	-52.6	-69.2	.000000	.016	.00562
-85.0	-42.2	-67.2	-34.8	-51.8	-68.7	.000000	.018	.00625
-80.0	-41.9	-66.9	-33.9	-50.9	-68.1	.000000	.021	.00698
-75.0	-41.6	-66.6	-32.9	-49.9	-67.6	.000000	.024	.00784
-70.0	-41.3	-66.3	-31.9	-48.9	-67.0	.000000	.028	.00887
-65.0	-40.9	-65.9	-30.8	-47.8	-66.3	.000000	.033	.01010
-60.0	-40.6	-65.6	-29.6	-46.6	-65.6	.000000	.039	.01160
-55.0	-40.2	-65.2	-28.4	-45.4	-64.8	.000000	.047	.01343

-50.0	-39.8	-64.8	-27.1	-44.1	-64.0	.000000	.057	.01570
-45.0	-39.3	-64.3	-25.7	-42.7	-63.1	.000000	.069	.01853
-40.0	-38.9	-63.9	-24.2	-41.2	-62.1	.000000	.086	.02211
-35.0	-38.4	-63.4	-22.6	-39.6	-61.0	.000000	.107	.02669
-30.0	-37.8	-62.8	-21.0	-38.0	-59.8	.000000	.135	.03255
-25.0	-37.3	-62.3	-18.9	-35.9	-58.5	.000000	.171	.04002
-20.0	-36.8	-61.8	-16.8	-33.8	-57.1	.000000	.215	.04930
-15.0	-36.3	-61.3	-14.8	-31.8	-55.7	.000000	.258	.06012
-10.0	-35.9	-60.9	-13.4	-30.4	-54.5	.000000	.285	.07110
-5.0	-35.7	-60.7	-12.8	-29.8	-53.9	.000000	.279	.07956
.0	-35.7	-60.7	-13.2	-30.2	-54.3	.000000	.250	.08261
5.0	-36.0	-61.0	-14.5	-31.5	-55.4	.000001	.240	.07924
10.0	-36.4	-61.4	-16.4	-33.4	-56.8	.000004	.252	.07095
15.0	-36.9	-61.9	-18.5	-35.5	-58.2	.000008	.252	.06046
20.0	-37.4	-62.4	-20.6	-37.6	-59.6	.000011	.232	.05007
25.0	-37.9	-62.9	-22.3	-39.3	-60.8	.000013	.200	.04097
30.0	-38.5	-63.5	-23.9	-40.9	-61.9	.000014	.167	.03349
35.0	-38.9	-63.9	-25.4	-42.4	-62.9	.000014	.137	.02753
40.0	-39.4	-64.4	-26.8	-43.8	-63.8	.000014	.111	.02283
45.0	-39.8	-64.8	-28.2	-45.2	-64.7	.000014	.090	.01912
50.0	-40.3	-65.3	-29.4	-46.4	-65.5	.000013	.074	.01618
55.0	-40.6	-65.6	-30.6	-47.6	-66.2	.000013	.061	.01383
60.0	-41.0	-66.0	-31.7	-48.7	-66.8	.000012	.051	.01193
65.0	-41.3	-66.3	-32.7	-49.7	-67.5	.000012	.042	.01038
70.0	-41.7	-66.7	-33.7	-50.7	-68.0	.000011	.036	.00910
75.0	-42.0	-67.0	-34.6	-51.6	-68.6	.000011	.031	.00803
80.0	-42.2	-67.2	-35.4	-52.4	-69.1	.000010	.026	.00714
85.0	-42.5	-67.5	-36.2	-53.2	-69.5	.000010	.023	.00638
90.0	-42.8	-67.8	-37.0	-54.0	-70.0	.000010	.020	.00574
95.0	-43.0	-68.0	-37.7	-54.7	-70.4	.000009	.018	.00518
100.0	-43.2	-68.2	-38.4	-55.4	-70.8	.000009	.016	.00471
105.0	-43.5	-68.5	-39.0	-56.0	-71.2	.000009	.014	.00429
110.0	-43.7	-68.7	-39.6	-56.6	-71.6	.000008	.012	.00392
115.0	-43.9	-68.9	-40.2	-57.2	-72.0	.000008	.011	.00360
120.0	-44.1	-69.1	-40.8	-57.8	-72.3	.000008	.010	.00332
125.0	-44.3	-69.3	-41.3	-58.3	-72.6	.000008	.009	.00307
130.0	-44.5	-69.5	-41.8	-58.8	-73.0	.000007	.008	.00284
135.0	-44.6	-69.6	-42.3	-59.3	-73.3	.000007	.008	.00264
140.0	-44.8	-69.8	-42.7	-59.7	-73.6	.000007	.007	.00246
145.0	-45.0	-70.0	-43.2	-60.2	-73.9	.000007	.006	.00230
150.0	-45.1	-70.1	-43.6	-60.6	-74.1	.000007	.006	.00215
155.0	-45.3	-70.3	-44.0	-61.0	-74.4	.000006	.005	.00202
160.0	-45.5	-70.5	-44.4	-61.4	-74.7	.000006	.005	.00190
165.0	-45.6	-70.6	-44.7	-61.7	-74.9	.000006	.005	.00179
170.0	-45.7	-70.7	-45.1	-62.1	-75.2	.000006	.004	.00169
175.0	-45.9	-70.9	-45.4	-62.4	-75.4	.000006	.004	.00159
180.0	-46.0	-71.0	-45.8	-62.8	-75.7	.000006	.004	.00151
185.0	-46.1	-71.1	-46.1	-63.1	-75.9	.000006	.004	.00143
190.0	-46.3	-71.3	-46.4	-63.4	-76.1	.000005	.003	.00135
195.0	-46.4	-71.4	-46.7	-63.7	-76.3	.000005	.003	.00129
200.0	-46.5	-71.5	-47.0	-64.0	-76.5	.000005	.003	.00122

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Û      C O R O N A    A N D    F I E L D       Û
Û E F F E C T S    P R O G R A M    V E R.  3  Û
Û   Source: Bonneville Power Administration    Û
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INPUT DATA LIST

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                12/19/2005          11:32:13
****************** BIGLOW CANYON WIND FARM*************
FIGURE 2 35-KV DOUBLE-CIRCUIT SHIELDED 954 ACSR RAIL 50MW-837A PER PHASE
1,0, 6, 7,0.0,   2.00,    1.00,     .00

(ENGLISH UNITS OPTION)

(GRADIENTS ARE COMPUTED BY PROGRAM)

PHYSICAL SYSTEM CONSISTS OF  7 CONDUCTORS, OF WHICH  6 ARE ENERGIZED PHASES

OPTIONS: 'COMB'
  5.000,  5.000, 10.000,    .000,  1.000, 75.000,   3.280,  2.000,  3.280
'CIR1-A  ','A',    -4.50,    37.00, 1,    1.196,     .000,  23.000,      .000,      .837,     .000
'CIR1-B  ','A',    -4.50,    31.00, 1,    1.196,     .000,  23.000,-120.000,      .837,     .000
'CIR1-C  ','A',    -4.50,    25.00, 1,    1.196,     .000,  23.000, 120.000,      .837,     .000
'CIR2-A  ','A',     4.50,    37.00, 1,    1.196,     .000,  23.000,      .000,      .837,     .000
'CIR2-B  ','A',     4.50,    31.00, 1,    1.196,     .000,  23.000,-120.000,      .837,     .000
'CIR2-C  ','A',     4.50,    25.00, 1,    1.196,     .000,  23.000, 120.000,      .837,     .000
'SH-1    ','A',      .75,    43.00, 1,     .385,     .000,     .000,      .000,     .000,     .000
 41 -200.0    5.0
 40    5.0    5.0
  0     .0     .0
1COMBINED OUTPUT OF AUDIBLE NOISE, RADIO NOISE, TVI, OZONE CONCENTRATION, GROUND GRADIENT AND MAGNETIC FIELD
****************** BIGLOW CANYON WIND FARM*************
FIGURE 2 35-KV DOUBLE-CIRCUIT SHIELDED 954 ACSR RAIL 50MW-837A PER PHASE
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	DIST. FROM CENTER OF TOWER (FEET)	HEIGHT (FEET)	MAXIMUM GRADIENT (KV/CM)	SUBCON DIAM. (IN)	NO. OF SUBCON	SUBCON SPACING (IN)	VOLTAGE L-N (KV)	PHASE ANGLE (DEGREES)	CURRENT (kAmps)	CORONA LOSSES (KW/MI)
CIR1-A	-4.50	37.00	2.85	1.20	1	.00	23.00	.00	.84	.000
CIR1-B	-4.50	31.00	3.19	1.20	1	.00	23.00	-120.00	.84	.000
CIR1-C	-4.50	25.00	2.82	1.20	1	.00	23.00	120.00	.84	.000
CIR2-A	4.50	37.00	2.86	1.20	1	.00	23.00	.00	.84	.000
CIR2-B	4.50	31.00	3.19	1.20	1	.00	23.00	-120.00	.84	.000
CIR2-C	4.50	25.00	2.82	1.20	1	.00	23.00	120.00	.84	.000
SH-1	.75	43.00	1.86	.38	1	.00	.00	.00	.00	.000

AN MICROPHONE HT.=   5.0 FT, RI ANT. HT.=   5.0 FT, TV ANT. HT.= 10.0 FT, ALTITUDE=   .0 FT
RI FREQ= 1.000 MHZ, TV FREQ=   75.000 MHZ, WIND VEL.(OZ)= 2.000 MPH, GROUND CONDUCTIVITY =   2.0 MMHOS/M
E-FIELD TRANSDUCER HT.=   3.3FT, B-FIELD TRANSDUCER HT.=   3.3FT

LATERAL DIST FROM REFERENCE (FEET)	AUDIBLE NOISE (RAIN) L50 DBA	AUDIBLE NOISE (FAIR) L50 DBA	RADIO INTERFERENCE (RAIN) L50 DBUV/M	RADIO INTERFERENCE (FAIR) L50 DBUV/M	TVI TOTAL RAIN DBUV/M	OZONE FOR RAIN RATE OF 1.00 IN/HR AT 0. FT LEVEL PPB	ELECTRIC FIELD KV/M	MAGNETIC FIELD GAUSS
-200.0	-44.0	-69.0	-45.1	-62.1	-74.8	.000000	.007	.00280
-195.0	-43.9	-68.9	-44.8	-61.8	-74.6	.000000	.008	.00294
-190.0	-43.7	-68.7	-44.5	-61.5	-74.3	.000000	.008	.00310
-185.0	-43.6	-68.6	-44.2	-61.2	-74.1	.000000	.009	.00326
-180.0	-43.5	-68.5	-43.8	-60.8	-73.9	.000000	.009	.00344
-175.0	-43.3	-68.3	-43.5	-60.5	-73.6	.000000	.010	.00364
-170.0	-43.2	-68.2	-43.1	-60.1	-73.4	.000000	.010	.00385
-165.0	-43.1	-68.1	-42.7	-59.7	-73.1	.000000	.011	.00408
-160.0	-42.9	-67.9	-42.3	-59.3	-72.8	.000000	.011	.00433
-155.0	-42.8	-67.8	-41.9	-58.9	-72.5	.000000	.012	.00461
-150.0	-42.6	-67.6	-41.4	-58.4	-72.3	.000000	.012	.00491
-145.0	-42.4	-67.4	-41.0	-58.0	-72.0	.000000	.013	.00524
-140.0	-42.3	-67.3	-40.5	-57.5	-71.7	.000000	.014	.00561
-135.0	-42.1	-67.1	-40.0	-57.0	-71.3	.000000	.015	.00602
-130.0	-41.9	-66.9	-39.5	-56.5	-71.0	.000000	.016	.00647
-125.0	-41.7	-66.7	-39.0	-56.0	-70.7	.000000	.017	.00697
-120.0	-41.5	-66.5	-38.4	-55.4	-70.3	.000000	.018	.00754
-115.0	-41.3	-66.3	-37.8	-54.8	-69.9	.000000	.019	.00817
-110.0	-41.1	-66.1	-37.2	-54.2	-69.5	.000000	.020	.00889
-105.0	-40.9	-65.9	-36.5	-53.5	-69.1	.000000	.022	.00970
-100.0	-40.7	-65.7	-35.8	-52.8	-68.7	.000000	.023	.01062
-95.0	-40.4	-65.4	-35.0	-52.0	-68.3	.000000	.024	.01168
-90.0	-40.2	-65.2	-34.2	-51.2	-67.8	.000000	.026	.01290
-85.0	-39.9	-64.9	-33.4	-50.4	-67.3	.000000	.028	.01432
-80.0	-39.7	-64.7	-32.5	-49.5	-66.8	.000000	.029	.01597
-75.0	-39.4	-64.4	-31.5	-48.5	-66.2	.000000	.030	.01791
-70.0	-39.1	-64.1	-30.5	-47.5	-65.7	.000000	.032	.02021
-65.0	-38.7	-63.7	-29.4	-46.4	-65.0	.000000	.032	.02294
-60.0	-38.4	-63.4	-28.3	-45.3	-64.4	.000000	.032	.02624
-55.0	-38.0	-63.0	-27.0	-44.0	-63.7	.000000	.030	.03022
-50.0	-37.7	-62.7	-25.7	-42.7	-62.9	.000000	.027	.03509
-45.0	-37.3	-62.3	-24.3	-41.3	-62.1	.000000	.023	.04107
-40.0	-36.8	-61.8	-22.8	-39.8	-61.2	.000000	.029	.04845
-35.0	-36.4	-61.4	-21.2	-38.2	-60.3	.000000	.056	.05756
-30.0	-35.9	-60.9	-19.6	-36.6	-59.3	.000000	.103	.06873
-25.0	-35.4	-60.4	-18.0	-35.0	-58.3	.000000	.177	.08216
-20.0	-35.0	-60.0	-16.5	-33.5	-57.2	.000000	.281	.09764

-15.0	-34.5	-59.5	-15.2	-32.2	-56.3	.000000	.412	.11409
-10.0	-34.2	-59.2	-14.3	-31.3	-55.6	.000000	.552	.12921
-5.0	-33.9	-58.9	-13.9	-30.9	-55.4	.000000	.662	.13988
.0	-33.9	-58.9	-14.1	-31.1	-55.6	.000000	.705	.14371
5.0	-33.9	-58.9	-13.9	-30.9	-55.4	.000000	.663	.13988
10.0	-34.2	-59.2	-14.3	-31.3	-55.7	.000003	.553	.12921
15.0	-34.5	-59.5	-15.2	-32.2	-56.3	.000007	.414	.11409
20.0	-35.0	-60.0	-16.5	-33.5	-57.3	.000013	.282	.09764
25.0	-35.4	-60.4	-18.0	-35.0	-58.3	.000018	.178	.08216
30.0	-35.9	-60.9	-19.6	-36.6	-59.3	.000021	.105	.06873
35.0	-36.4	-61.4	-21.3	-38.3	-60.3	.000022	.057	.05756
40.0	-36.8	-61.8	-22.8	-39.8	-61.2	.000023	.029	.04845
45.0	-37.3	-62.3	-24.3	-41.3	-62.1	.000023	.022	.04107
50.0	-37.7	-62.7	-25.7	-42.7	-62.9	.000022	.026	.03509
55.0	-38.0	-63.0	-27.1	-44.1	-63.7	.000022	.029	.03022
60.0	-38.4	-63.4	-28.3	-45.3	-64.4	.000021	.031	.02624
65.0	-38.7	-63.7	-29.5	-46.5	-65.1	.000020	.031	.02294
70.0	-39.1	-64.1	-30.5	-47.5	-65.7	.000020	.031	.02021
75.0	-39.4	-64.4	-31.6	-48.6	-66.3	.000019	.030	.01791
80.0	-39.7	-64.7	-32.5	-49.5	-66.8	.000018	.028	.01597
85.0	-39.9	-64.9	-33.4	-50.4	-67.3	.000018	.027	.01432
90.0	-40.2	-65.2	-34.3	-51.3	-67.8	.000017	.025	.01290
95.0	-40.4	-65.4	-35.0	-52.0	-68.3	.000016	.024	.01168
100.0	-40.7	-65.7	-35.8	-52.8	-68.7	.000016	.022	.01062
105.0	-40.9	-65.9	-36.5	-53.5	-69.2	.000015	.021	.00970
110.0	-41.1	-66.1	-37.2	-54.2	-69.6	.000015	.020	.00889
115.0	-41.3	-66.3	-37.8	-54.8	-70.0	.000014	.019	.00817
120.0	-41.5	-66.5	-38.4	-55.4	-70.3	.000014	.017	.00754
125.0	-41.7	-66.7	-39.0	-56.0	-70.7	.000013	.016	.00697
130.0	-41.9	-66.9	-39.5	-56.5	-71.0	.000013	.015	.00647
135.0	-42.1	-67.1	-40.0	-57.0	-71.4	.000013	.015	.00602
140.0	-42.3	-67.3	-40.5	-57.5	-71.7	.000012	.014	.00561
145.0	-42.4	-67.4	-41.0	-58.0	-72.0	.000012	.013	.00524
150.0	-42.6	-67.6	-41.5	-58.5	-72.3	.000012	.012	.00491
155.0	-42.8	-67.8	-41.9	-58.9	-72.6	.000011	.012	.00461
160.0	-42.9	-67.9	-42.3	-59.3	-72.8	.000011	.011	.00433
165.0	-43.1	-68.1	-42.7	-59.7	-73.1	.000011	.010	.00408
170.0	-43.2	-68.2	-43.1	-60.1	-73.4	.000011	.010	.00385
175.0	-43.3	-68.3	-43.5	-60.5	-73.6	.000010	.009	.00364
180.0	-43.5	-68.5	-43.8	-60.8	-73.9	.000010	.009	.00344
185.0	-43.6	-68.6	-44.2	-61.2	-74.1	.000010	.009	.00326
190.0	-43.7	-68.7	-44.5	-61.5	-74.4	.000010	.008	.00310
195.0	-43.9	-68.9	-44.8	-61.8	-74.6	.000010	.008	.00294
200.0	-44.0	-69.0	-45.1	-62.1	-74.8	.000009	.007	.00280

1

EXHIBIT AA

Electric Transmission Line

Comment

(Exhibit AA, pages AA-1 through AA-14) Provide the electric and magnetic field analysis for all aboveground segments of the collection system.

Response

EMF calculations for 34.5-kV overhead collector lines are provided in Supplemental ASC, Attachment AA-1. The attachment consists of a revised version of ASC Exhibit AA, titled Exhibit AA2.

Additional Information

Supplemental ASC, Figure AA-1 (attached) shows the minor revisions associated with the facilities layout as shown in Figures C-2 and C-2A and discussed in the "Additional Information" subsection of Supplemental ASC, Exhibit C.

EXHIBIT BB

Other Information

This exhibit has not changed.

EXHIBIT CC

Other Legal Citations

This exhibit has not changed.

APPENDIX

Turbine Corridor
Request for Additional Information (RAI)

Wind Turbine Corridor Supplement

Site Certificate Application for the Biglow Canyon Wind Farm
Sherman County, Oregon

This document is submitted by Orion Sherman County Windfarm LLC (Applicant) and contains information supplementing the Biglow Canyon Wind Farm application for site certificate (ASC). This supplemental information explains and refines the Turbine Corridor siting proposal contained in the ASC. This submittal is made in response to the Oregon Department of Energy's (ODOE or Department) November 1, 2005 email message from Cathy Van Horn to Carlos Pineda.

Overview of the Turbine Corridor Concept

The Applicant seeks flexibility, within defined 500-foot wide Turbine Corridors, to make the final selection of turbine vendor, turbine size, number of turbines to be installed and precise turbine layout, after issuance of the site certificate and prior to commencement of construction. The Applicant has used the ASC to establish the legal and technical feasibility of granting the requested flexibility, across a defined range of turbine sizes and numbers of turbines and within defined Turbine Corridors, consistent in all cases with all applicable Council standards.

For some resources protected by Council standards, the Applicant has simply taken a worst-case approach in the ASC by considering the maximum possible impacts under any possible turbine size/number/layout combination, and demonstrated compliance with Council standards on this basis. For these resources, no further pre-construction submissions or special site certificate conditions are required.

For other resources, the Applicant has presented, and believes the draft proposed order (DPO) should contain, formulas and methods for assessing differential impacts of various permitted turbine size/number/layout combinations and for designating appropriate mitigation based on these combinations. These formulas and methods will be approved in the site certificate and applied prior to construction when the Applicant selects turbine vendors, sizes and numbers and designates a final layout. To address this latter group of resources, after site certificate issuance and prior to construction, the Applicant will provide to the Department a "Final Layout" consisting of a selection of turbine vendor, turbine size, total number of turbines and the location of each turbine. The Final Layout

will be accompanied by final resource impact calculations and final mitigation measures based upon those impact calculations.[1]

In sum, the Applicant's proposed approach will grant the Applicant important flexibility both in terms of turbine vendor and size selection and in terms of turbine micrositing within the defined Turbine Corridors. At the same time, it will ensure that for all resources protected by Council standards, compliance will be based either upon a worst-case methodology or upon an actual-impacts methodology. The validity and feasibility of both methods will be established by the evidence provided in the ASC and in response to Department requests for additional information, thus making the approach consistent with Council rules and more general requirements of Oregon administrative law.

Turbine Corridor - Coordinates, Dimensions, and Rationale

The Applicant proposes 19 individual Turbine Corridors. The locations of the Turbine Corridors are illustrated in Figure 1, with each corridor labeled by number. Attachment 1 defines the boundaries of each corridor as a series of coordinates, forming a closed polygon. In other words, drawing straight lines ("connecting-the-dots") between the given coordinates for each Turbine Corridor forms the defined boundaries of that Turbine Corridor.

Turbine Corridors are 500 feet wide, except in the following cases: a) at "end points", where they are approximately equivalent to semi-circles with a 250 foot radius, or b) in specific locations where two corridor segments are joined into one larger corridor. These features are incorporated into the coordinates presented in Attachment 1 and shown graphically in Figure 1.

Turbine Corridors run generally north-south, which is perpendicular to prevailing westerly winds, to maximize energy capture. Movement of wind turbine locations along the north-south axes during the Applicant's siting process allows the Applicant to space turbines appropriately so they do not interfere aerodynamically with each other. Larger capacity turbines generally have larger rotor diameters, thus requiring greater spacing between turbines along the north-south axes.

The Applicant has set its Turbine Corridor width at 500 feet in order to increase the east-west spacing between corridors. Since prevailing winds are westerly, turbines within a corridor will disturb wind flow to turbines in corridors located to the east (downwind). This "wake effect" must be mitigated by increasing the

[1] In response to market demand, the Facility may be constructed in two or more discrete phases. In this document and in the ASC the discussion of the Final Layout and related pre-construction site certificate conditions is intended to apply to a phased approach. Thus, prior to construction of "Phase I," the Final Layout for Phase I, but not subsequent phases, would be submitted to the Department. Similarly, pre-construction obligations (e.g., noise standard compliance and retirement security) would be fulfilled based on the phase to be constructed.

east-west spacing between turbines. Mitigating such wake effects by adjusting east-west distances between turbines improves the utilization of the wind resource, thus optimizing wind turbine electrical generation and project economics. Optimizing east-west location and corridor spacing is a complex and iterative process that also takes into account many factors, including locational wind data, site topography and elevation, noise setbacks, visual and environmental impacts, and construction feasibility and cost issues.

In fact, while a primary function of the width of the Turbine Corridors at the Biglow Canyon Wind Farm site is to optimize the capture of the wind resource, the Applicant also believes that a Turbine Corridor concept closely models the approach actually used in the siting of wind projects. In addition to micrositing based on the wind resources and turbine sizes, siting of wind energy projects must also consider the potential for finding cultural artifacts, new ecological features, or micro-habitats during pre-construction engineering surveys; siting must likewise take into account changing land use preferences of farmers and other landowners, and the technical considerations of designing access roads and collection systems in varied terrain, among other factors. Any of these or other factors can cause the Applicant to reconsider the precise locations of wind turbines and associated facilities within the Turbine Corridors.

Given the range of turbine rotor diameters and rated capacities that the Applicant is considering, as well as the topography of the Facility site, wider Turbine Corridors (1000 feet wide or more) would provide greater flexibility to micro-site turbines, to mitigate "wake effects" and to optimize the layout with respect to other factors. The Applicant considered proposing such larger corridors, but ultimately determined that a 500 foot corridor width strikes the best balance between project optimization and countervailing factors such as the costs of surveying and studying larger corridors and the Council's need to know the location of energy facilities with relative certainty at the time the site certificate is issued.

In brief, the Applicant looks at a variety of factors – including predictions based on meteorological data, interaction with terrain, wake effects and degradation of turbine capacity factors, as well as land use and environmental factors – when micro-siting turbines. Having a defined 500 foot Turbine Corridor which has been previously studied by the Applicant and approved by the Council in the site certificate and project order, saves time and effort in costly amendments of the Site Certificate, and provides greater flexibility in discovering and implementing best-fit siting alternatives.

Turbine Corridors – Impact Calculations

Table 1 shows an updated habitat impact calculation table. The area of all the Turbine Corridors totals 2,163 acres, of which 2,025 acres (94% of total corridor

area) is Category 6 Agricultural or Developed Habitat. Figure 2 shows the Turbine Corridors together with the 750 foot habitat buffer and habitat types contained within the Turbine Corridors and buffers. As described in the ASC, permanent impacts from the "footprint" of the Energy Facility within the Turbine Corridors are limited to approximately 11 acres (0.5% of the total corridor area), all in Category 3 or 4 habitats.

Table 1 is the same as Table P-8 in the ASC, with the addition of two columns: 1) total acreages contained within the 500 foot Turbine Corridors, and 2) worst-case or "maximum possible impact" based on siting facilities within the Turbine Corridors in non-agricultural habitat to the maximum extent possible. The calculation of maximum possible impact is described below.

During the course of conversations with ODOE staff and its consultants, information was requested on the *maximum possible* impact of facilities, as opposed to the *actual* or *expected* impact of facilities. That is, the Applicant was asked to calculate impacts based not on the actual or expected impact of the footprint of the proposed facilities layout[2], but on the maximum possible impact of the footprint of the facilities, assuming that the Applicant ultimately made micro-siting decisions that placed turbines and associated permanent facilities in non-agricultural habitat in every possible case. This exercise was undertaken and the results are illustrated by Figures 3-7.[3] The impacts increase from approximately 11 acres of actual or expected impact to approximately 12.5 acres (or 0.6% of the total corridor acreage) of maximum possible impact. This very small change from expected to worst case impact highlights the fact that the Facility is located almost entirely on cultivated land.

A revised Mitigation and Monitoring Plan has been submitted to the ODOE and ODFW. The plan contains revised impact calculations and proposes formulas for upfront mitigation of direct and displacement impacts, among other matters. Because the divergence between expected and worst-case direct habitat impacts is so small, the Applicant has simply proposed to commit up-front to mitigate for the worst-case impact and not to request a reduction in the size of the mitigation area based upon the eventual, actual "Final Layout" of the turbines and other facilities.

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[2] In the ASC submitted on October 12th, 2005, and in this Turbine Corridor Supplement, the Applicant uses the 225-turbine Minimum Turbine Layout, as it results in the greatest direct permanent impact "footprint".

[3] Given the prevalence of agricultural land throughout the Turbine Corridors, the methods used to generate this worst-case approach were simple: anyplace a turbine could be moved within a corridor, consistent with minimum turbine spacing requirements, in order to impact non-agricultural land, it was moved for purposes of this exercise. Access roads and collector cables similarly were moved in order to pass through non-agricultural land wherever possible.

Table 1	Total Acres (within 750 feet of facilities)	Total Acres (within 500 foot turbine corridors)	Current Facility Layout: Temporary Facilities (acres disturbed)	Current Facility Layout: Permanent Facilities (acres lost)	*Worst Case*[1]: *Permanent Facilities (acres lost)*
Category 1	**2.6**	**0.0**	**0.0**	**0.0**	**0.0**
Upland Trees	2.6	0.0	0.0	0.0	*0.0*
Category 2	**13.7**	**0.0**	**0.0**	**0.0**	**0.0**
Intermittent Stream/Riparian	0.2	0.0	0.0	0.0	0.0
Riparian Trees	0.1	0.0	0.0	0.0	*0.0*
Shrub-steppe	13.5	0.0	0.0	0.0	*0.0*
Category 3	**931.5**	**105.6**	**13.6**	**7.4**	**8.7**
CRP	709.6	101.9	12.4	7.2	*8.5*
Shrub-steppe	216.0	3.6	1.2	0.2	*0.2*
Intermittent streams	0.2	0.0	0.0	0.0	*0.0*
Upland trees	5.5	0.0	0.0	0.0	*0.0*
Pond	0.3	0.0	0.0	0.0	*0.0*
Category 4	**313.2**	**32.6**	**4.1**	**3.6**	**3.8**
CRP	138.3	22.8	3.1	2.7	*2.7*
Shrub-steppe	38.8	1.4	0.1	0.0	*0.0*
Grassland	136.1	8.4	1.0	0.9	*1.1*
Category 5	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Category 6	**10430.1**	**2025.1**	**356.9**	**154.9**	**153.4**
Developed	64.4	6.7	4.0	4.6	*4.6*
Agricultural	10365.7	2018.4	353.0	150.3	*148.8*
TOTAL	**11691.2**	**2163.2**	**374.6**	**165.9**	**165.9**
Category 3 and 4 Impacts			**17.7**	**11.0**	***12.5***

[1]*Maximum possible impact based on micro-siting into non-agricultural habitat within corridors wherever possible. See Figures 3-7 for illustration of approach.*

Turbine Corridors – Conditions of Site Certificate

Below are proposed pre-construction conditions to implement the Turbine Corridor concept with respect to the following resources: noise, retirement of the Facility, and jurisdictional waters.

With respect to all other resources covered by Council standards (including wildlife habitat, scenic/aesthetic, recreation, protected areas, land use, seismic, soils, and threatened/endangered species), the ASC already considers the maximum possible impacts under any possible turbine size/vendor/layout and no layout-specific mitigation measures are proposed. Accordingly, for this latter set of resources protected by Council standards, no specific pre-construction conditions are required.

1. General conditions

1.1 Prior to commencement of construction the site certificate holder shall submit to the Department written information showing the final selection of wind turbine vendor, turbine size, total number of turbines to be installed and a detailed layout plan showing the locations of individual turbines, turbine access roads, electrical collector cables, O&M building, permanent meteorological towers, project substation and transmission lines, along with the temporary laydown and staging areas (collectively, the "Final Layout").

1.2 Turbines, turbine access roads and electrical collector cables shown on the Final Layout must be located entirely within Turbine Corridors approved in the site certificate, except where the site certificate expressly authorizes access roads or collector cables outside of Turbine Corridors.

2. Noise Conditions

2.1 Prior to commencement of construction, and based upon the Final Layout, the site certificate holder shall submit to the Department information specifying the noise levels generated by the turbine model(s) and size(s) designated in the Final Layout, along with the additional information required in conditions 2.2, 2.3 and 2.4 below.

2.2 Based upon the Final Layout, the site certificate holder also shall submit modelling results showing the 36 and 50 dBA noise contours around all Energy Facility components, and identifying each structure that is a noise sensitive receptor located within these contours.

2.3 For each structure that is a noise sensitive receptor identified within the 50 dBA contour, the site certificate holder shall submit a non-occupancy agreement or similar agreement ensuring that as of the commencement of operation of the Facility, the structure will no longer be a noise sensitive receptor as defined in applicable regulations of the Oregon Department of Environmental Quality.

2.4 For each structure that is a noise sensitive receptor identified within the 36 dBA contour but outside of the 50 dBA contour, the site certificate holder shall submit a noise standard waiver, noise easement or similar agreement demonstrating that as of commencement of operation of the Facility, Oregon noise standards will be met at that structure.

3. Decommissioning Conditions

3.1 Prior to commencement of construction, the site certificate holder shall submit to the Department an estimate of the net cost of retiring the Facility and restoring the Facility site, based on the designated turbine vendor, size, number and other information in the Final Layout and derived by applying the methods specified in the site certificate and final order.

3.2 Prior to commencement of construction, the site certificate holder shall submit to the Department a bond, letter of credit or other form of security acceptable to the Department in the amount of the final estimate of the net cost of retiring the Facility and restoring the site.

4. Wetlands/Jurisdictional Waters Conditions

4.1 Prior to commencement of construction and based upon the Final Layout, the site certificate holder shall submit to the Department and the Oregon Division of State Lands maps showing the location of each new or improved road and/or collector cable crossing of the jurisdictional waters of the state identified in the site certificate and final order. These maps shall be accompanied by the information required in conditions 4.2 and 4.3 below.

4.2 The site certificate holder also shall submit a final calculation of the amounts of removal and fill in each jurisdictional water of the state.

4.3 Based upon the final impact calculations required by condition 4.2, and upon the methods approved in the site certificate and final order, the site certificate holder also shall submit a designation of the location and size of the jurisdictional water mitigation area(s).

4.4 Upon review by the Department and DSL, the information submitted pursuant to conditions 4.1 to 4.3 shall be incorporated into the final removal-fill permit for the Facility.

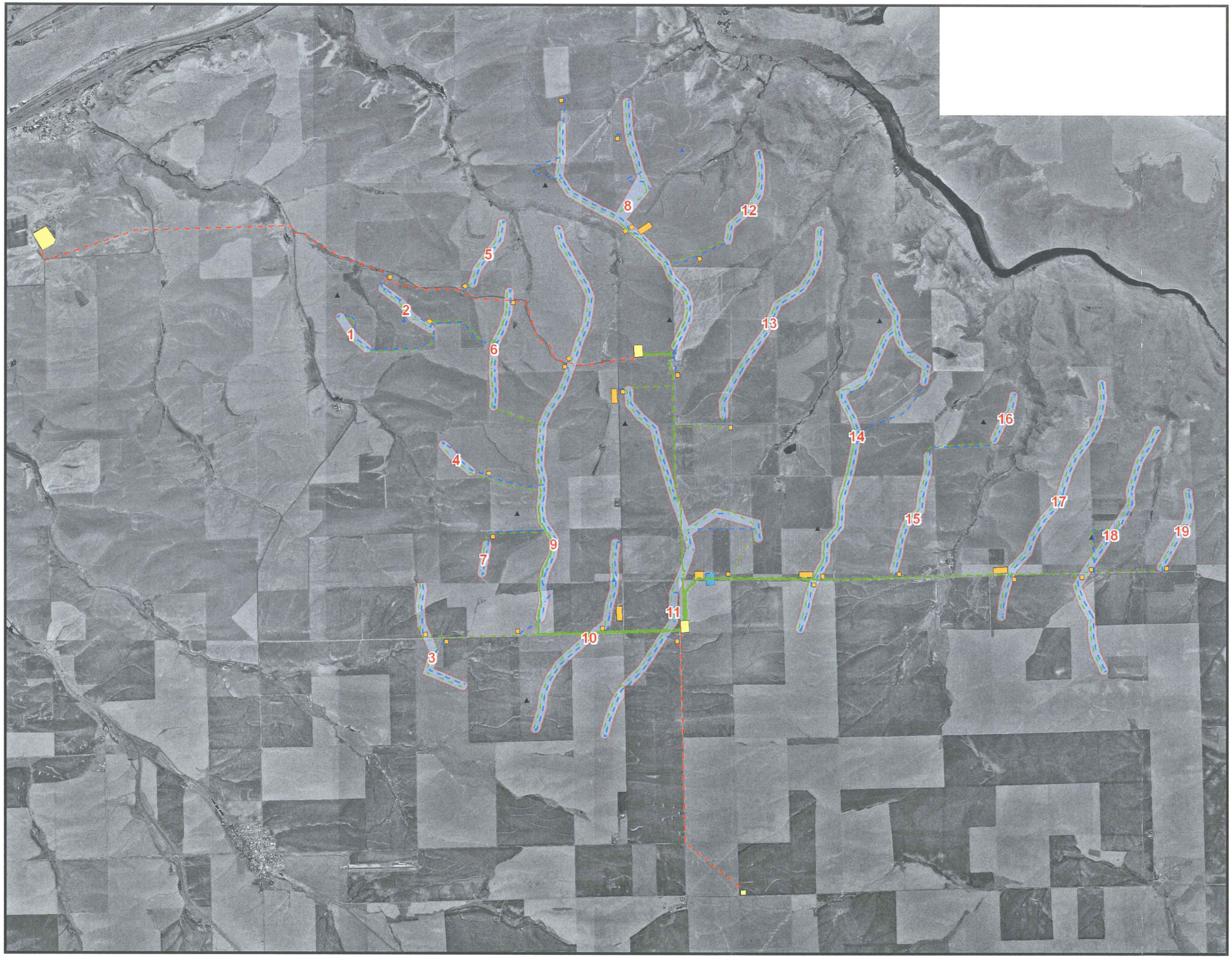


Figure 1. Wind Turbine Corridor Supplement - Biglow Canyon Wind Project Turbine Corridors and Facilities

- Turbine Corridor
- Proposed Transmission Line
- Proposed Collector System
- Access Rds - New or Improved

Met Towers

- Permanent
- Temporary
- Proposed Substation
- O&M Facility
- Staging Areas

N
W E
S

0 0.5 1 2 3

Kilometers

WEST, Inc.

Figure 2. Wind Turbine Corridor Supplement - Biglow Canyon Wind Project Facilities and Habitat

- Turbine Corridor
- New Facilities - 750-ft Buffer
- Proposed Transmission Line
- Proposed Collector System
- Access Rds - New or Improved

Met Towers

- Permanent
- Temporary
- Proposed Substation
- O&M Facility
- Staging Areas

Habitat

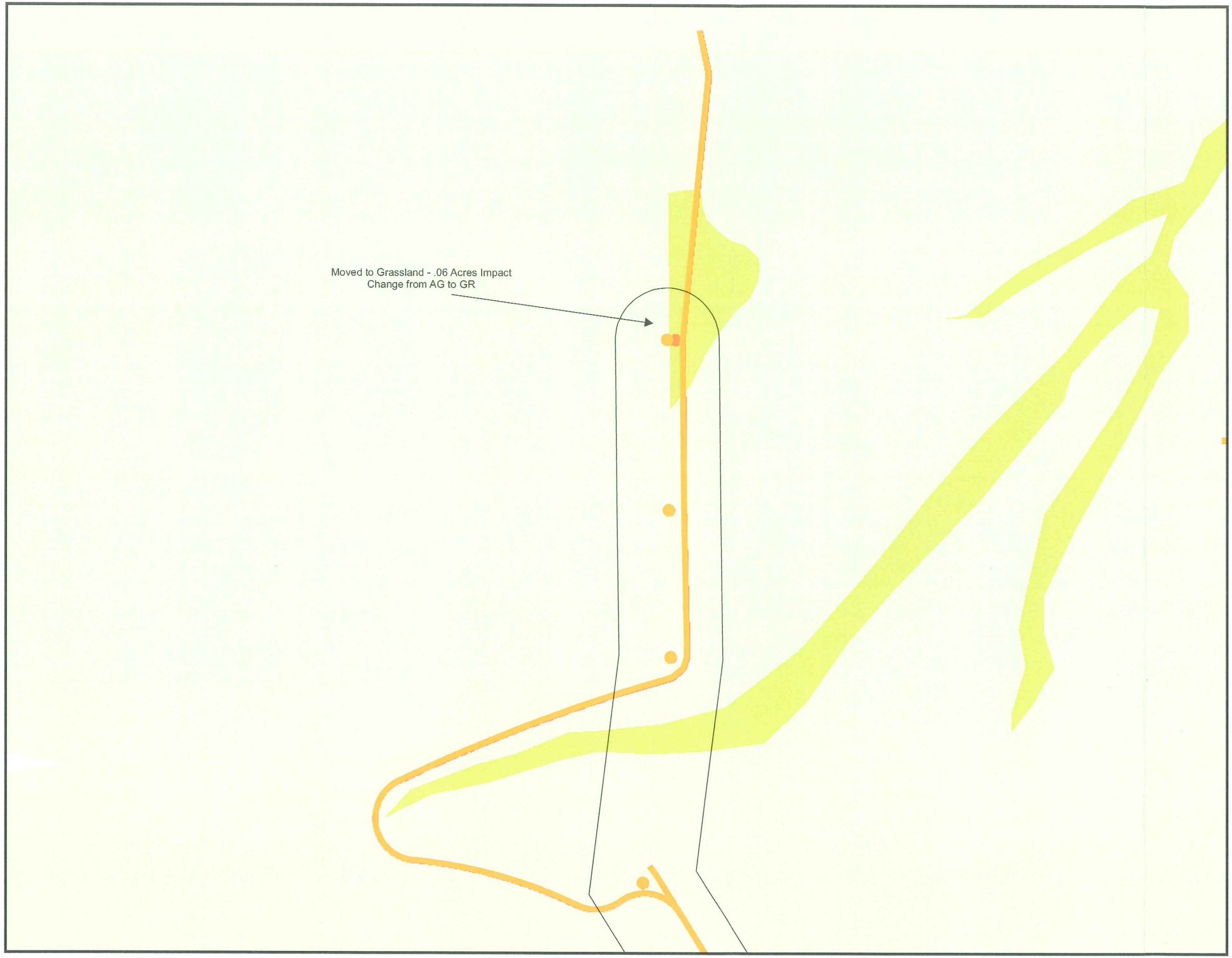
- Agriculture (AG)
- CRP
- Developed (DE)
- Grassland (GR)
- Stream/ riparian trees (WS/RT)
- Pond (PO)
- Shrub-steppe (SS)
- Upland trees (UT)

Habitat Categories 1 - 6

N
W E
S

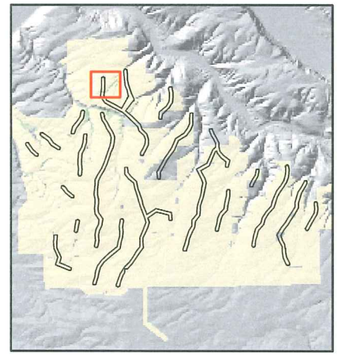
0 0.5 1 2 3
Kilometers

WEST, Inc



Wind Turbine Corridor Supplement Habitat Impacts: Maximum Possible Impact Figure 3

Area Enlarged



Legend

- Proposed Turbine Corridors
- Current Footprint
- Worse Case Scenario Footprint
- Agriculture
- CRP
- Developed
- Grassland
- Intermittent stream
- Intermittent stream/ riparian trees
- Shrub-steppe
- Upland trees

N

250 0 250 500 Feet

CH2MHILL

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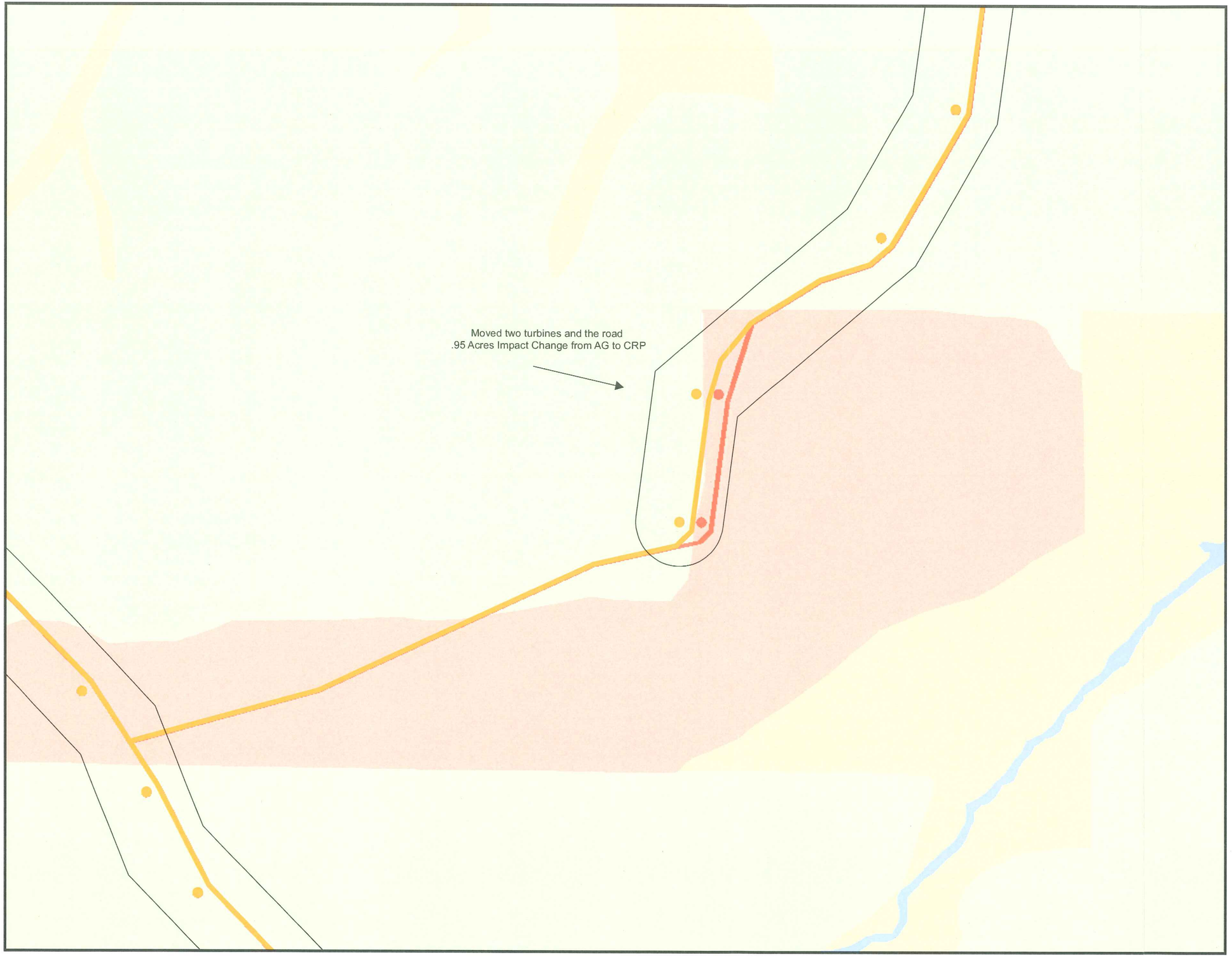
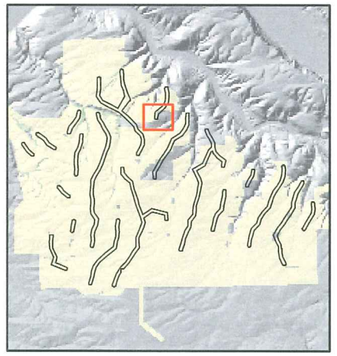


Wind Turbine Corridor Supplement Habitat Impacts: Maximum Possible Impact Figure 4

Area Enlarged



Legend

- Proposed Turbine Corridors
- Current Footprint
- Worse Case Scenario Footprint
- Agriculture
- CRP
- Developed
- Grassland
- Intermittent stream
- Intermittent stream/ riparian trees
- Shrub-steppe
- Upland trees

N

250 0 250 500 Feet

CH2MHILL

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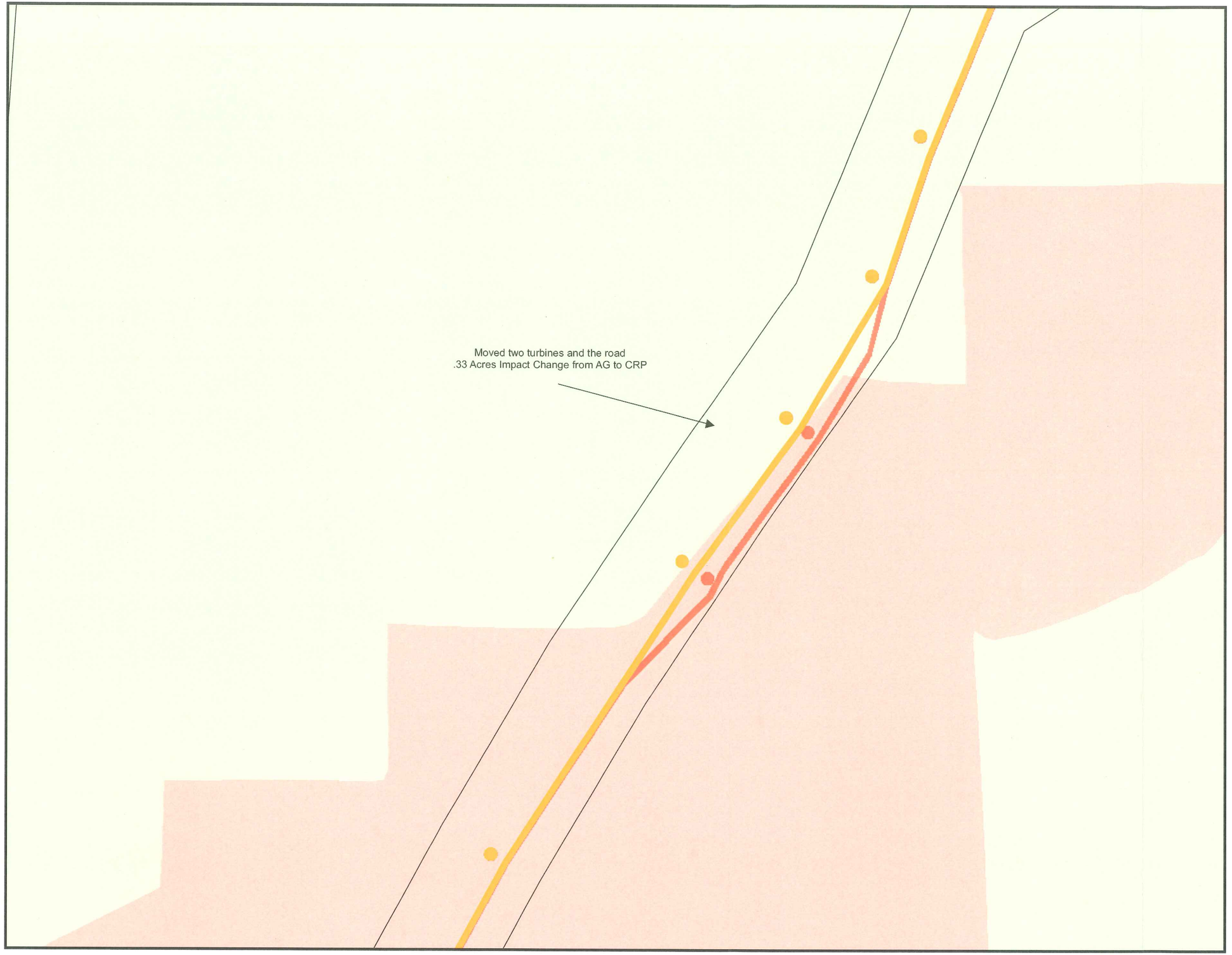
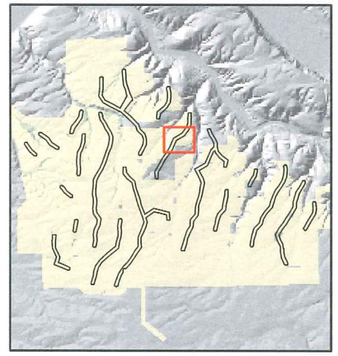


Wind Turbine Corridor Supplement Habitat Impacts: Maximum Possible Impact Figure 5

Area Enlarged



Legend

- Proposed Turbine Corridors
- Current Footprint
- Worse Case Scenario Footprint
- Agriculture
- CRP
- Developed
- Grassland
- Intermittent stream
- Intermittent stream/ riparian trees
- Shrub-steppe
- Upland trees

N

250 0 250 500 Feet

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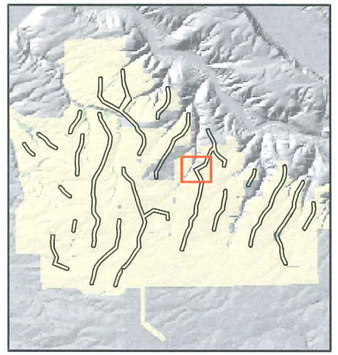
Wind Turbine Corridor Supplement Habitat Impacts: Maximum Possible Impact Figure 6

Area Enlarged



Legend

- Proposed Turbine Corridors
- Current Footprint
- Worse Case Scenario Footprint
- Agriculture
- CRP
- Developed
- Grassland
- Intermittent stream
- Intermittent stream/ riparian trees
- Shrub-steppe
- Upland trees

N

250 0 250 500 Feet

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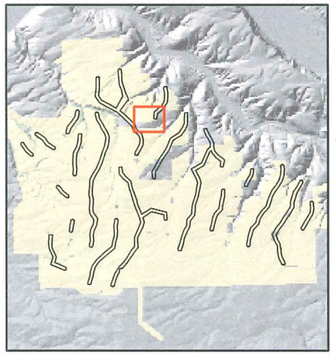
Moved two turbines and the road
.95 Acres Impact Change from AG to CRP

Wind Turbine Corridor Supplement Habitat Impacts: Maximum Possible Impact Figure 7

Area Enlarged



Legend

- Proposed Turbine Corridors
- Current Footprint
- Worse Case Scenario Footprint
- Agriculture
- CRP
- Developed
- Grassland
- Intermittent stream
- Intermittent stream/ riparian trees
- Shrub-steppe
- Upland trees

N

250 0 250 500 Feet

CH2MHILL

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