

Exhibit I Soil Protection

Boardman to Hemingway Transmission Line Project



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Amended Preliminary Application for Site Certificate

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TABLE OF CONTENTS

1.0	INTRODUCTION.....	I-1
2.0	APPLICABLE RULES AND AMENDED PROJECT ORDER PROVISIONS	I-1
2.1	General Standards for Siting Facilities	I-1
2.2	Site Certificate Application Requirements	I-1
2.3	Amended Project Order Provisions	I-1
3.0	ANALYSIS.....	I-2
3.1	Analysis Area	I-2
3.2	Methods.....	I-3
3.2.1	Identifying Soil Properties.....	I-3
3.2.2	Overview of Impacts Analysis.....	I-5
3.2.3	Assessing Erosion Impacts	I-5
3.2.4	Assessing Soil Reclamation Potential	I-7
3.2.5	Identifying Current Land Uses that Require or Depend on Productive Soils and Evaluating Impacts on Productive Soils.....	I-8
3.3	Soil Identification and Description	I-9
3.4	Current Land Use	I-10
3.4.1	High Value Farmland Soils	I-11
3.4.2	Land Cover Types	I-11
3.5	Soil Impact Assessment	I-12
3.5.1	Temporary Impacts.....	I-13
3.5.2	Permanent Impacts	I-19
3.5.3	Retirement Phase Impacts	I-23
3.5.4	Soil Impact Summary	I-23
3.6	Mitigation Measures and No Adverse Impacts.....	I-24
3.6.1	Avoidance of Sensitive Soils	I-24
3.6.2	Minimize Soil Impacts with Best Management Practices	I-24
3.6.3	Minimizing Impacts of Spills	I-25
3.6.4	Mitigation of Soil Erosion by Water.....	I-27
3.6.5	Mitigation for Wind Erosion.....	I-29
3.6.6	Mitigation for Soil Compaction.....	I-29
3.6.7	Soil Revegetation and Reclamation	I-29
3.6.8	Mitigation of Farmland and Forested Areas	I-31
3.6.9	Adherence to Federal Agency Land Use Plans.....	I-31
3.6.10	Soil Mitigation Summary	I-32
3.6.11	No Adverse Impacts	I-32
3.7	Soil Monitoring.....	I-32
4.0	IDAHO POWER'S PROPOSED SITE CERTIFICATE CONDITIONS.....	I-33
5.0	CONCLUSION	I-34
6.0	COMPLIANCE CROSS-REFERENCES.....	I-34
7.0	RESPONSE TO PUBLIC COMMENTS	I-36
8.0	REFERENCES.....	I-36

LIST OF TABLES

Table I-1. Soil Orders within the Site BoundaryI-10

Table I-2. High Value Farmland Soils within Site BoundaryI-11

Table I-3. Land Cover Types within the Site BoundaryI-11

Table I-4. Comparison of Site Boundary and Disturbance Areas (acres)I-13

Table I-5. Erosion Factors in the Temporary Disturbance Area (acres/percent of
Temporary Disturbance Area).....I-14

Table I-6. Soil Reclamation Factors in Temporary Disturbance Area (acres/percent of
Temporary Disturbance Area).....I-16

Table I-7. Temporary Impacts to High Value Farmland SoilsI-17

Table I-8. Land Cover Types within the Temporary Disturbance AreaI-18

Table I-9. Erosion Factors in the Permanent Disturbance AreaI-21

Table I-10. Permanent Impacts to High Value Farmland SoilsI-22

Table I-11. Land Cover Types within the Permanent Disturbance AreaI-23

Table I-12. Compliance Requirements and Relevant Cross-ReferencesI-35

Table I-13. Public Comments.....I-36

LIST OF FIGURES

Figure I-1. STATSGO and SSURGO Soil Data Coverage.....I-4

LIST OF ATTACHMENTS

- Attachment I-1. Mapbook of Soil Mapping Units
- Attachment I-2. Table of Soil Mapping Units
- Attachment I-3. 1200-C Permit Application and Draft Erosion and Sediment Control Plan
- Attachment I-4. ODEQ 1200-C Permit Acknowledgement

ACRONYMS AND ABBREVIATIONS

Amended Project Order	First Amended Project Order, Regarding Statutes, Administrative Rules and Other Requirements Applicable to the Proposed Boardman to Hemingway Transmission Line (December 22, 2014)
ASC	application for site certificate
BLM	Bureau of Land Management
BMP	best management practice
DOE	U.S. Department of Energy
EFSC or Council	Energy Facility Siting Council
EPA	Environmental Protection Agency
ESCP	Erosion and Sediment Control Plan
GIS	geographic information system
IPC	Idaho Power Company
kV	kilovolt
mm	millimeter
NED	National Elevation Dataset
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
OAR	Oregon Administrative Rule
ODA	Oregon Department of Agriculture
ODEQ	Oregon Department of Environmental Quality
Project	Boardman to Hemingway Transmission Line Project
ReGAP	Regional Gap Analysis Project
RMP	resource management plan
ROW	right-of-way
SPCC	Spill Prevention, Control, and Countermeasures Plan
SSURGO	Soil Survey Geographic Database
STATSGO	State Soil Geographic Database
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USGS	U.S. Geological Survey

1 Exhibit I

2 Soil Protection

3 1.0 INTRODUCTION

4 Exhibit I describes and analyzes the impacts to soils potentially resulting from the Boardman to
5 Hemingway Transmission Line Project (Project). Exhibit I shows that, while construction and
6 operation of the Project may create the potential for impacts to soils due to erosion, Idaho
7 Power Company (IPC) will implement best management practices (BMPs) through its Erosion
8 and Sediment Control Plan (ESCP) to avoid and minimize potential adverse impacts.

9 2.0 APPLICABLE RULES AND AMENDED PROJECT ORDER 10 PROVISIONS

11 2.1 General Standards for Siting Facilities

12 The Soil Protection Standard at Oregon Administrative Rule (OAR) 345-022-0022 provides:

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

18 2.2 Site Certificate Application Requirements

19 OAR 345-021-0010(1)(i) provides Exhibit I must include the following information regarding soil
20 conditions and uses in the analysis area:

21 *(A) Identification and description of the major soil types in the analysis area.*

22 *(B) Identification and description of current land uses in the analysis area, such as*
23 *growing crops, that require or depend on productive soils.*

24 *(C) Identification and assessment of significant potential adverse impact to soils from*
25 *construction, operation and retirement of the facility, including, but not limited to, erosion*
26 *and chemical factors such as salt deposition from cooling towers, land application of*
27 *liquid effluent, and chemical spills.*

28 *(D) A description of any measures the applicant proposes to avoid or mitigate adverse*
29 *impact to soils.*

30 *(E) The applicant's proposed monitoring program, if any, for adverse impact to soils*
31 *during construction and operation.*

32 2.3 Amended Project Order Provisions

33 The Amended Project Order includes the following discussion:

34 *The applicant shall include information describing the impact of construction and*
35 *operation of the proposed facility on soil conditions in the analysis area. Describe all*
36 *measures proposed to maintain soil productivity during construction and operation. The*
37 *applicant should consult with local farmers, landowners, soil conservation districts, and*

1 federal land managers regarding mitigation of impacts to farm and forest lands. Specific
2 discussion should include weed encroachment, interference with irrigation equipment,
3 and the potential for restrictions to aerial applications caused by the proximity of
4 transmission towers.

5 Exhibit I should also include the required evidence related to the federally-delegated
6 National Pollutant Discharge Elimination System (NPDES) 1200-C permit application
7 (alternatively, the NPDES information could be incorporated into Exhibit BB – Other
8 Information). OAR 345-021-0000(7) requires the applicant to submit one copy of all
9 applications for federally-delegated permits, or provide a schedule of the date by which
10 the applicant intends to submit the application. In addition to a copy of the federally
11 delegated permit application, the applicant must also provide a letter or other indication
12 from the ODEQ stating that the agency has received a permit application from the
13 applicant, identifying any additional information the agency is likely to need from the
14 applicant based on the agency's review of the application, and estimating the date when
15 the agency will complete its review and issue a permit decision.

16 The applicant should emphasize discussion of erosion control in Exhibit I, especially for
17 impacted forestland to minimize and mitigate damage to forest soils and streams. A draft
18 erosion and sediment control plan must be provided for review (if not already
19 incorporated into an attached NPDES permit application), if the applicant will rely upon
20 the erosion and sediment control plan to meet the soil protection standard.

21 (Amended Project Order, Section III(i)).

22 **3.0 ANALYSIS**

23 **3.1 Analysis Area**

24 The analysis area for Exhibit I includes all areas within the Site Boundary, which is defined as
25 "the perimeter of the site of a proposed energy facility, its related or supporting facilities, all
26 temporary laydown and staging areas, and all corridors and micro-siting corridors proposed by
27 the applicant" (OAR 345-001-0010(55)). The Site Boundary encompasses the following facilities
28 in Oregon:

- 29 • The Proposed Route, consisting of 270.8 miles of new 500-kilovolt (kV) electric
30 transmission line, removal of 12 miles of existing 69-kV transmission line, rebuilding of
31 0.9 mile of a 230-kV transmission line, and rebuilding of 1.1 miles of an existing 138-kV
32 transmission line;
- 33 • Four alternatives that each could replace a portion of the Proposed Route, including the
34 West of Bombing Range Road Alternative 1 (3.7 miles), West of Bombing Range Road
35 Alternative 2 (3.7 miles), Morgan Lake Alternative (18.5 miles), and Double Mountain
36 Alternative (7.4 miles);
- 37 • One proposed 20-acre station (Longhorn Station);
- 38 • Ten communication station sites of less than ¼-acre each and two alternative
39 communication station sites;
- 40 • Permanent access roads for the Proposed Route, including 206.3 miles of new roads
41 and 223.2 miles of existing roads requiring substantial modification, and for the
42 Alternative Routes, including 30.2 miles of new roads and 22.7 miles of existing roads
43 requiring substantial modification; and

- 1 • Thirty-one temporary multi-use areas and 299 pulling and tensioning sites of which four
2 will have light-duty fly yards within the pulling and tensioning sites.

3 The Project features are fully described in Exhibit B, and the Site Boundary for each Project
4 feature is described in Exhibit C, Table C-24. The location of the Project features and the Site
5 Boundary is outlined in Exhibit C.

6 **3.2 Methods**

7 **3.2.1 Identifying Soil Properties**

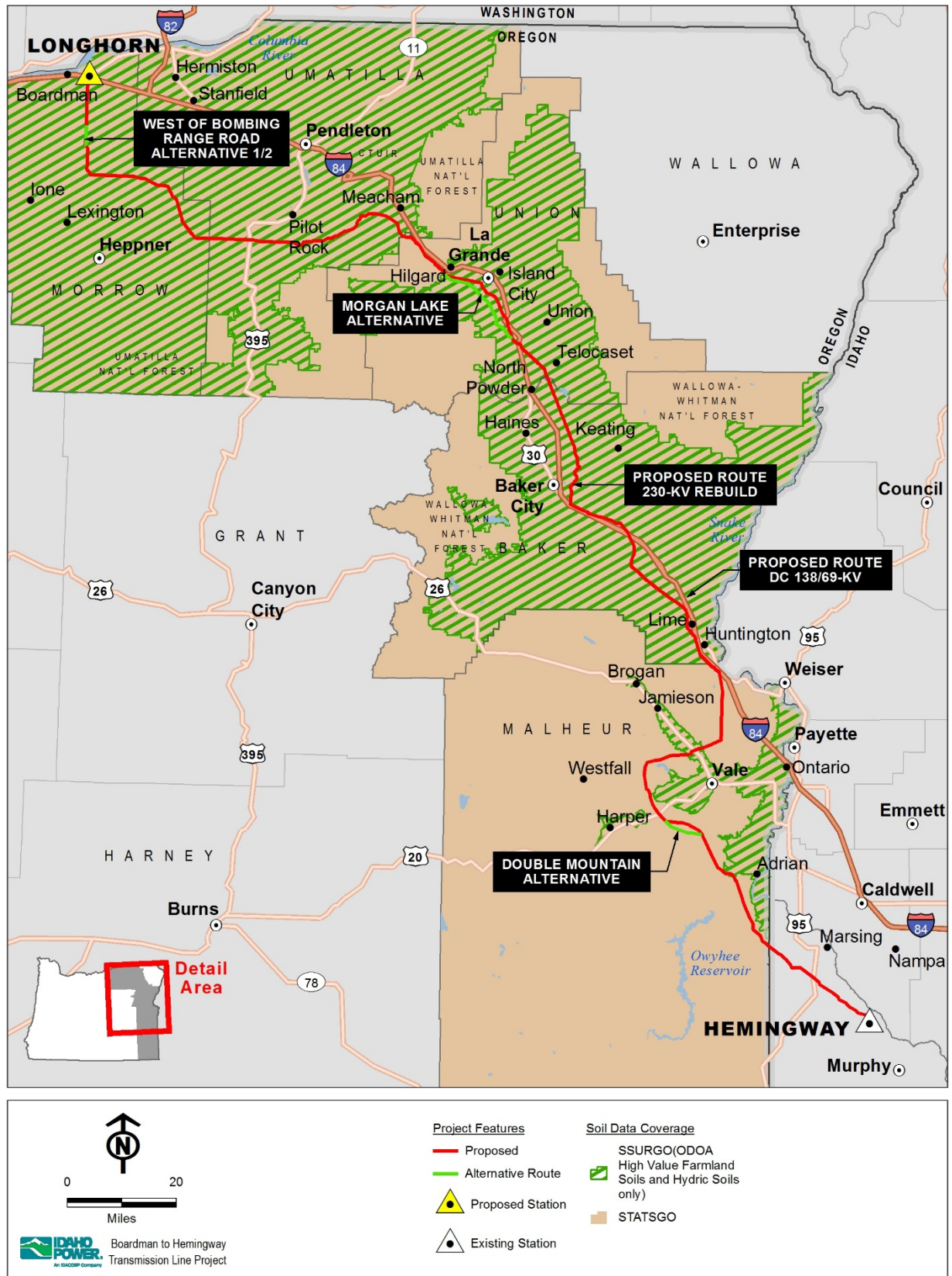
8 IPC identified the properties of soils throughout the Site Boundary, using literature-derived soil
9 properties and land cover types. The U.S. Department of Agriculture (USDA) Natural Resources
10 Conservation Service (NRCS) maintains the State Soil Geographic Database (STATSGO;
11 NRCS 2011) which presents general soil properties for the entire United States. In this report,
12 STATSGO data are used to characterize soil erosion and soil reclamation properties. See
13 Attachment I-1 for a mapbook of the STATSGO soil mapping units contained within the Site
14 Boundary. See Attachment I-2 for a table displaying the STATSGO soil properties by soil
15 mapping units contained within the Site Boundary.

16 The NRCS also maintains the Soil Survey Geographic Database (SSURGO) database, which is
17 a compilation of county soil surveys performed with a mapping resolution scale of approximately
18 1:24,000. SSURGO data, as compared to STATSGO data, include more detailed soil properties
19 information based on smaller map units. However, SSURGO data do not provide complete
20 coverage of the Site Boundary (see Figure I-1). The SSURGO database was used only if similar
21 data were not available in STATSGO. In addition, the hydric soils were evaluated using
22 SSURGO data as well as data from the Oregon Wetlands Database (Oregon Spatial Data
23 Library 2013).

24 The U.S. Geological Survey (USGS) maintains the National Elevation Dataset (NED) with
25 nationwide coverage of detailed elevation information compiled from multiple sources, and
26 updated at two-month intervals. The NED data were used for the slope analysis presented in
27 this Exhibit.

28 The NRCS soils data were used for preliminary evaluation of soil impacts due to erosion and for
29 soil suitability for Project reclamation. When the final route has been selected and prior to
30 construction, additional site-specific soil properties will be surveyed during the site-specific
31 geotechnical investigation. Detailed information relating to the scope of the geotechnical
32 investigation is presented in the main text of Exhibit H and Exhibit H, Attachment H-1. The
33 investigation will include drilling of exploration borings and collection of soil samples for
34 laboratory analysis of soil properties. Relevant to Exhibit I, the soil analyses performed through
35 geotechnical investigation will also be used to verify the STATSGO and SSURGO data used in
36 the preliminary soil impact analyses presented in this Exhibit.

37 Figure I-1 below shows the STATSGO and SSURGO soil data coverage across the Project
38 area.



1
2

Figure I-1. STATSGO and SSURGO Soil Data Coverage

1 **3.2.2 Overview of Impacts Analysis**

2 To assess the potential Project impacts of construction and operations on soils, IPC focused on
3 the areas of soil disturbance and not necessarily on all areas throughout the Site Boundary, as
4 not all of the Site Boundary will be disturbed. The soil analyses were evaluated for two related
5 disturbance conditions, the temporary disturbance area and the permanent disturbance area.

6 Both temporary and permanent impacts will occur from the construction, operation, and retirement of
7 the Project. Temporary disturbance during the 2- to 3-year construction period includes ground
8 disturbance to areas that would be restored to preconstruction conditions following completion of the
9 Project; these include temporary access roads, multi-use areas, pulling and tensioning sites, light-duty
10 fly yards, areas around tower pads and the Longhorn Station. Temporary impacts during operations
11 would result from the periodic disturbance associated with inspection and maintenance of the line,
12 while temporary impacts associated with retirement of the Project would be similar to those described
13 for construction.

14 Permanent impacts are associated with areas that are disturbed during construction, but which are
15 not allowed to restore to preconstruction conditions. Permanent impacts would occur along access
16 roads, communication stations, Longhorn Station, and tower sites, as well as within the permanent
17 right-of-way (ROW) and vegetative maintenance zones along portions of the Project that cross
18 forested/woodland habitats. Exhibit B describes the Project in detail, as well as the associated
19 construction and operations activities that could result in soil disturbance.

20 **3.2.3 Assessing Erosion Impacts**

21 To assess potential impacts to soil from erosion caused by the Project, IPC analyzed the soil
22 properties affecting soil erosion and slope. Factors that influence soil erosion include soil
23 texture, structure, length and slope steepness, vegetation cover density, and rainfall or wind
24 intensity. Soils most susceptible to erosion by wind and water are typically non-cohesive soils
25 with low infiltration rates, residing on moderate to steep slopes, and soils that are sparsely
26 vegetated. Non-cohesive soils include silty, sandy, or gravelly soils, with little to no clay-sized
27 particles. Wind erosion processes are less affected by slope angles but highly influenced by
28 wind intensity and slope aspect relative to wind direction. The potential for soil erosion within the
29 Site Boundary varies based on the climate, erosion mechanism, and soil characteristics.

30 In this Exhibit, erosion potential was analyzed through soil K factor, soil wind erodibility, and
31 slope assessment. The soil loss tolerance, or T factor, was considered as a means of
32 determining the amount of soil that is most susceptible to erosion impacts. The detailed
33 geotechnical investigation will provide further evaluation of soil erosion potential, based on both
34 additional review of soil properties and laboratory testing of soil samples collected during
35 geotechnical drilling. STATSGO data were used for the analysis of soil erosion properties, and
36 NED data were used to evaluate slope.

37 **3.2.3.1 Soil K Factor**

38 Soil erosion hazards were mapped throughout the Site Boundary based on the soil's K factor. K
39 is defined as the soil-erodibility factor and is based on a standard measurement condition in a
40 unit plot. The unit plot is 72.6 feet (22.1 meters) long on a 9 percent slope, maintained in
41 continuous fallow, tilled up and down hill periodically to control weeds and break crusts that form
42 on the surface of the soil. The plots are plowed, disked, and cultivated the same for a row crop
43 of corn or soybeans except that no crop is grown on the plot.

44 Soils high in clay have low K values because they are resistant to detachment. Detachment is
45 the term that describes the removal of soil fragments from a soil mass that is caused by falling

1 rain drops, running water, or wind. It is the first stage of erosion. Coarse-textured soils, such as
2 sandy soils, have low K values because of low runoff even though these soils are easily
3 detached. Medium textured soils, such as the silt loam soils, have moderate K values because
4 they are moderately susceptible to detachment and produce moderate runoff. Soils having high
5 silt contents are the most erodible of all soils. They are easily detached, tend to crust, and
6 produce high rates of runoff.

7 The U.S. Department of Energy (DOE), Pacific Northwest National Laboratory website (DOE
8 2003) guideline was used to segregate the mapped NRCS STATSGO soils into low, moderate,
9 or high K factor soils. DOE defined low K factor values between 0.05 to 0.15, moderate K factor
10 values were from 0.25 to 0.4, and high K factor values were greater than 0.4. The closest
11 category in the STATSGO data to 0.4 was 0.37. As such, a K factor of 0.37 or greater was used
12 to define soils most likely to erode.

13 To quantify the potential erosion impacts by K factor, the temporary and permanent disturbance
14 areas identified within the Site Boundary were overlaid on the K factor geographic information
15 system (GIS) data, and the area of high K factor soils was reported in acres.

16 3.2.3.2 Wind Erodibility

17 The potential for soil erosion by wind was evaluated using NRCS STATSGO wind erodibility
18 group data, which are based on the texture of the surface layer, the size and durability of
19 surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and
20 frozen soil layers also influence wind erosion. Project construction activities that could expose
21 soils to wind erosion include any surface disturbance (e.g., road construction and
22 improvements, vegetation clearing). Wind erodibility is defined by the tons of soil that might be
23 lost annually per acre of soils exposed (tons per acre per year), with higher values indicating
24 higher potential to be eroded by the wind. The wind erodibility is measured on an average
25 annual basis. There may be some seasonal variability of wind erodibility depending on seasonal
26 winds, or presence or absence of soil moisture or frozen ground.

27 Soils in wind erodibility groups 1 through 4 (see
28 https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/?cid=nrcs142p2_054224#95 for
29 definition of wind erodibility groups), which would have greater than or equal to 86 tons per acre
30 per year, were considered highly wind erodible. To quantify the potential impacts to soil due to
31 wind erosion, the temporary and permanent disturbance areas identified within the Site
32 Boundary were overlaid on the wind erodibility GIS data and the acreage for each wind
33 erodibility group was determined. The area of highly wind erodible soils was reported in acres.

34 3.2.3.3 Slope

35 In general, steep slopes possess a greater potential for erosion by water or mass movements
36 than flat areas. Ground-disturbing activities may cause greater soil erosion on steep slopes than
37 on gentle slopes.

38 USGS NED data (30-meter resolution) were used to assess the potential for erosion on steep
39 slopes. Areas containing greater than 25 percent slope were considered to have greater erosion
40 potential. The area of steep slopes within the temporary and permanent disturbance areas was
41 reported in acres.

42 3.2.3.4 Soil T Factor

43 The soil T factor is an indicator of soil loss tolerance, or the amount of soil loss that can be
44 tolerated for soil to remain productive. Soils with a low T factor are more sensitive to the effects
45 of erosion than soils with higher T factors. The U.S. Forest Service (USFS) Soil Management

1 Handbook (USFS 1991) states that soils with a soil loss tolerance less than or equal to 2 tons
2 per acre per year are generally considered soils with low soil loss tolerance. This value for soil
3 loss tolerance was used in this analysis, in conformance to the USFS guideline.

4 STATSGO data were used to evaluate soil T factor. The area of soils containing a low T factor
5 were analyzed for both the temporary and permanent disturbance areas and reported in acres.

6 **3.2.4 Assessing Soil Reclamation Potential**

7 Soil properties were also evaluated for suitability for reclamation. Different soil types or
8 properties have different potential for reclamation. Identification of the soil properties in different
9 areas may affect decisions on the types of vegetation to be planted, the timing of reclamation,
10 and the likelihood that follow-up tasks may be required to assure reclamation success.

11 Reclamation is planned as part of the construction phase of the Project, and the effects of soil
12 factors to soil reclamation were evaluated only for the temporary disturbance areas to be
13 disturbed during construction.

14 IPC looked at several soil properties in evaluating reclamation potential. These properties
15 included soil compaction, the amount of stony-rocky soil, droughty soil, depth to bedrock, and
16 the presence of hydric soils. STATSGO data were used to assess all soil reclamation properties
17 except for reclamation of hydric soils. STATSGO data reported no hydric soils, so the SSURGO
18 database was used in conjunction with hydric soil data from the Oregon Wetlands Database.
19 The methods for evaluation of each property are presented below.

20 **3.2.4.1 Soil Compaction**

21 Compaction could occur during both construction and operation of the Project. Different soil
22 types have different susceptibility to compaction; however, as a conservative measure, it was
23 assumed that if the soil is disturbed by construction equipment or operations vehicles, there is at
24 least some potential for soil compaction. Although all soil is susceptible to compaction to varying
25 degrees, wet soils are more readily compacted than dry soils, and clay loam or finer soils with
26 poor drainage characteristics were assumed to be highly compaction prone. A review of the
27 STATSGO database indicated that no highly compaction-prone soils were found within the Site
28 Boundary. Therefore, the impacts to highly compaction-prone soils are not quantified in this
29 section. However, mitigation of compacted soils is discussed below in Section 3.5.1.2.

30 **3.2.4.2 Stony-Rocky Soil**

31 Stony-rocky soils are defined by the NRCS as having at least 20 percent coarse fragments, with
32 coarse fragments defined as soil particles with diameters greater than 2 millimeters (mm). Soil
33 particles greater than 2 mm are termed coarse particles and include gravels, cobbles, stones,
34 and boulders (Soil Survey Division Staff 1993). Rocks greater than 75 mm include cobbles,
35 stones, and boulders. Stony-rocky soil containing predominantly gravel could reduce
36 revegetation success because gravel competes with plant roots for space and does not retain
37 moisture as well as fine-grained soils. Soils containing large quantities of cobbles and larger
38 rocks provide the same impediments to revegetation as gravel. They also interfere with
39 mechanical cultivation equipment such as plows, soil augers, and seed drills.

40 To assess the impacts to revegetation efforts from stony-rocky soils, areas of stony-rocky soil
41 (as defined by soil particles greater than 2 mm in diameter) were presented as acres within the
42 temporary disturbance area.

1 3.2.4.3 Droughty Soil

2 Drought-prone soils are termed “droughty soils” due to their low water-holding capacity.
3 Droughty soils may not hold enough water within the root zone to support plant life, making
4 revegetation difficult. A soil was considered droughty if it has sandy loam or coarser texture, and
5 drainage class of moderately to excessively well-drained. The areas of droughty soil were
6 presented in acres within the temporary disturbance area.

7 3.2.4.4 Shallow Bedrock

8 According to NRCS soil descriptions, shallow bedrock is defined as bedrock occurring within
9 20 inches of ground surface. Bedrock is considered as moderately deep between 20 and 40
10 inches, as deep from 40 to 60 inches, and as very deep if greater than 60 inches. The bedrock
11 classifications from shallow to deep were examined and are referred to as “shallow bedrock”
12 because they occur within 5 feet of ground surface, the area where most Project disturbance will
13 occur. Blasting would be necessary in the footings of transmission line towers and possibly
14 other structures, in areas where shallow bedrock would be encountered. This blasting could
15 result in mixing of topsoil and subsoil, and an increase in the stony-rocky component in these
16 areas, making revegetation difficult. The STATSGO database provided a category for bedrock
17 of 51 inches below ground surface; therefore, the analysis here assumes that bedrock
18 encountered less than 51 inches below ground surface that is disturbed during construction
19 could negatively affect revegetation efforts. It should be noted that the STATSGO depth to
20 bedrock data were not available for some soil mapping units. Those units are noted in the soil
21 map unit descriptions in Attachment I-2, Table I-2-1.

22 The areas containing shallow bedrock were presented as acres within the temporary
23 disturbance area to assess the impacts to revegetation efforts.

24 3.2.4.5 Hydric Soil

25 Hydric soils are formed under saturation, flooding, or ponding for a sufficient period to develop
26 anaerobic characteristics in the upper soil horizon. Hydric soils, combined with surface water or
27 shallow groundwater and indicative vegetation species, are necessary indicators of wetlands.
28 Disturbance of hydric soils may result in decreased water storage capacity of soil, decreased
29 soil porosity, and decreased ability to replace hydrophytic vegetation.

30 Hydric soils are a necessary component of wetlands and wetland information is presented in
31 Exhibit J. All wetlands contain hydric soil. However, many hydric soils lack the vegetation or
32 surface water characteristics to be considered wetlands. Therefore, the extent of hydric soils is
33 greater than the area of wetlands.

34 Hydric soil was analyzed using SSURGO data and hydric soil data from the Oregon Wetlands
35 Database. The areas of hydric soils were presented in acres within the temporary disturbance
36 area.

37 **3.2.5 Identifying Current Land Uses that Require or Depend on Productive Soils** 38 **and Evaluating Impacts on Productive Soils**

39 For the purposes of Exhibit I, IPC conservatively identified areas within the analysis area that
40 may include current land uses that require or depend on productive soils, through analysis of
41 high value farmland soils data and land cover type data. The high value farmland soils data
42 indicate soils within the analysis area that have potential for agricultural land use; the land cover
43 type data indicate how land within the analysis area are currently used. Neither dataset

1 conclusively identified all current land uses in the analysis area that require or depend on
2 productive soils.¹

3 3.2.5.1 High Value Farmland Soils

4 IPC obtained data from the Oregon Department of Agriculture (ODA) identifying high value
5 farmland soils for Morrow, Umatilla, Union, Baker, and Malheur counties. The high value
6 farmland soils data include soils that are irrigated and classified as prime, unique, Class I, or
7 Class II or that are non-irrigated and classified as prime, unique, Class I, or Class II (see
8 generally ORS 215.710).

9 For purposes of identifying current land uses that require or depend on productive soils for
10 Exhibit I, IPC conservatively assumed that lands with high value farmland soils are actively used
11 for agricultural purposes and therefore depend on the presence of productive soils.

12 Acres of high value farmland soils within the Site Boundary are presented in this Exhibit, along
13 with impacts within the temporary and permanent disturbance areas.

14 3.2.5.2 Land Cover Type

15 Regional Gap Analysis Project (ReGAP) data along with desktop interpretation of 2012 National
16 Agriculture Imagery Program imagery were used to characterize land cover types within the Site
17 Boundary. This dataset includes the following land cover types: Developed, Bare Ground,
18 Cultivated Cropland (which includes dryland and irrigated agriculture), Forest/Woodland, Open
19 Water, Pasture/Hay, Shrub/Grass, and Wetland. For purposes of Exhibit I, IPC assumed that
20 the following land cover types require productive soils: Cultivated Cropland, Forest/Woodland,
21 and Pasture/Hay.

22 Acres of each land cover type listed above within the Site Boundary are presented in this
23 Exhibit, along with impacts within the temporary and permanent disturbance areas. Additional
24 information regarding agricultural land uses is presented in Exhibit K, Attachment K-1,
25 Agricultural Lands Assessment. The Agricultural Lands Assessment contains discussion of
26 current agricultural conditions, including the types of agriculture and the specific crops grown in
27 the analysis area.

28 3.3 Soil Identification and Description

29 OAR 345-021-0010(1)(i)(A): Identification and description of the major soil types in the
30 analysis area.

31 Soils are placed into orders based on their characteristics. At the highest level, there are 12 different
32 soil orders, with each order further refined into subunits based on additional defining characteristics.
33 The Project crosses several STATSGO soil orders, which are discussed below.

34 The analysis area in the Boardman area and throughout Morrow County consists predominantly
35 of the soil orders Aridisol and Mollisol. Aridisols are found in dry climates and contain
36 subsurface horizons in which clay, calcium carbonate, silica, salts, and/or gypsum have
37 accumulated due to limited leaching. Aridisols are usually not suitable for agriculture unless
38 irrigation water is provided. Revegetation in these areas may be more difficult due to lack of
39 water, or revegetation may need to occur during a wetter portion of the year. The order Mollisol

¹ Areas potentially containing agricultural lands were visually surveyed from public roads by IPC to determine actual land uses. More information regarding farm uses can be found in Exhibit K, Attachment K-1, Agricultural Lands Assessment.

1 includes a variety of soils formed mainly under grasslands and is the predominant order in
 2 northeastern Oregon. These soils have a strong organic component formed by the
 3 decomposition of grass and other vegetation, which results in very productive soils. These soils,
 4 if properly preserved or reclaimed, should be favorable for revegetation.

5 Soils in the Blue Mountains consist primarily of Mollisols. Small portions of northeast Oregon also
 6 contain the soil orders Andisol and Entisol. The order Andisol is represented by a variety of soils
 7 with a predominantly volcanic or volcanoclastic origin. Andisols in eastern Oregon are predominantly
 8 found under coniferous forest vegetation within the Blue Mountains. However, Andisols are
 9 sometimes cleared of forest and used for agriculture. Entisols are typically young or recently
 10 developed soils, displaying little or no development of differing soil layers or horizons. Given
 11 adequate moisture, Andisols would be suitable for reclamation. Entisols are typically shallow or
 12 sandy, lack organic matter, are easily erodible, and do not contain well-developed soil layers. The
 13 lack of water, scarce organic matter, and sandy soil conditions may require revegetation with
 14 species suitable to this soil type. Soils south of the Blue Mountains are a mix of Mollisols, Entisols,
 15 and Aridisols.

16 Table I-2-1 in Attachment I-2 displays soil factors by individual soil map units. For the analyses
 17 below, the soil properties for individual soil map units have been combined to provide
 18 summaries for the Proposed Route by county, and for the individual alternative route (see Table
 19 I-1). Attachment I-1 comprises a mapbook displaying the soil mapping units for areas within the
 20 Site Boundary.

21 **Table I-1. Soil Orders within the Site Boundary**

Route	County	Soil Order ³ (acres)			
		Aridisols	Mollisols	Andisols	Entisols
Proposed Route	Morrow ¹	287	2,441	–	406
	Umatilla	–	2,949	366	38
	Union	–	2,929	79	–
	Baker ²	–	4,623	–	826
	Malheur	2,584	3,303	–	–
Total Proposed Route		2,871	16,244	445	1,270
Alternative Routes					
West of Bombing Range Road Alternative 1	Morrow	99	–	–	–
West of Bombing Range Road Alternative 2	Morrow	92	–	–	–
Morgan Lake Alternative	Union	–	1,418	79	–
Double Mountain	Malheur	3	679	–	–

¹ Includes station acres.

² Includes rebuild segment.

³ Source: STATSGO data.

22 3.4 Current Land Use

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

25 For the purposes of Exhibit I, IPC conservatively identified areas within the analysis area that
 26 may include current land uses that require or depend on productive soils, using high value
 27 farmland soils and land cover type. Identification of estimated actual current land uses in the

1 analysis area is discussed in more detail in the Agricultural Lands Assessment, Exhibit K,
2 Attachment K-1.

3 **3.4.1 High Value Farmland Soils**

4 As shown in Table I-2, high value farmland soils data were used to identify lands that may
5 include current land uses that require or depend on productive soils within the Site Boundary.
6 The high value farmland soils data do not provide a qualitative description of actual current land
7 use, but may be representative of current agricultural land uses within the Site Boundary.

8 **Table I-2. High Value Farmland Soils within Site Boundary**

Route	County	Site Boundary (acres)	High Value Farmland Soils (acres) ³
Proposed Route	Morrow ¹	3,134	1,136
	Umatilla	3,352	326
	Union	3,007	230
	Baker ²	5,448	99
	Malheur	5,888	132
Total Proposed Route		20,829	1,922
Alternative Routes			
West of Bombing Range Road Alternative 1	Morrow	96	35
West of Bombing Range Road Alternative 2	Morrow	90	30
Morgan Lake	Union	1,496	75
Double Mountain	Malheur	669	–

¹ Includes station acres.

² Includes rebuild segment.

³ Source: SSURGO data.

9 **3.4.2 Land Cover Types**

10 The USDA ReGAP data were also used to identify land cover types that may include current land
11 uses that require or depend on productive soils (see Table I-3). The land cover type data do not
12 provide a qualitative description of actual current land use but, with the exception of developed,
13 open water, and bare ground categories, the remaining land cover types may be representative of
14 current land uses that require or depend on productive soils to support the current use.

15 **Table I-3. Land Cover Types within the Site Boundary**

Route	County	Site Boundary (acres)	Agriculture/Developed (acres) ³	Bare Ground (acres) ³	Cultivated Cropland (acres) ³	Forest/Woodland (acres) ³	Open Water (acres) ³	Pasture/Hay (acres) ³	Shrub/Grass (acres) ³	Wetland (acres) ³
Proposed Route	Morrow ¹	3,133	27	<1	1,089	-	4	46	1,967	-
	Umatilla	3,352	22	<1	278	659	–	104	2,243	45
	Union	3,007	28	23	131	1,099	–	<1	1,658	68
	Baker ²	5,448	27	54	127	146	<1	27	5,050	18
	Malheur	5,888	30	30	289	2	3	102	5,427	5
Total		20,829	134	107	1,914	1,906	7	280	16,345	135

Route	County	Site Boundary (acres)	Agriculture/ Developed (acres) ³	Bare Ground (acres) ³	Cultivated Cropland (acres) ³	Forest/ Woodland (acres) ³	Open Water (acres) ³	Pasture/ Hay (acres) ³	Shrub/ Grass (acres) ³	Wetland (acres) ³
Alternative Routes										
West of Bombing Range Road Alt 1	Morrow	99	9	-	15	-	-	2	73	-
West of Bombing Range Road Alt 2	Morrow	92	7	-	9	-	-	1	75	-
Morgan Lake	Union	1,497	3	4	82	804	-	-	566	37
Double Mountain	Malheur	682	-	-	-	-	-	-	682	-

¹ Includes station acres.

² Includes rebuild segment.

³ Source: ReGAP database.

1 3.5 Soil Impact Assessment

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

6 This section identifies and assesses potential adverse impacts to soils from the Project due to
7 erosion, loss of soil reclamation potential, compaction, and chemical spills. Additionally, as
8 directed by the Amended Project Order, potential impacts to productive soils are discussed. The
9 analysis is organized by temporary and permanent disturbance impacts.

10 The Project does not contain cooling towers, and no activity associated with the Project will
11 result in salt deposition or land application of liquid effluent.

12 The impacts to soils are limited because not all of the Site Boundary will be disturbed. The soil
13 analyses were evaluated using the temporary disturbance area and the permanent disturbance
14 area. The temporary and permanent disturbance areas are both completely contained within the
15 Site Boundary and occupy only small percentages of the Site Boundary, as shown in Table I-4.
16 Summaries of construction and operations disturbance areas by feature are presented in Exhibit
17 C, Table C-24. The Site Boundary is also displayed by feature in maps presented in Exhibit C,
18 Attachments C-2 and C-3.

19

1 **Table I-4. Comparison of Site Boundary and Disturbance Areas (acres)**

Route	County	Site Boundary (acres)	Temporary Disturbance (acres)	Permanent Disturbance (acres)
Proposed Route	Morrow ¹	2,503	530	72
	Umatilla	3,805	881	98
	Union	2,906	791	90
	Baker ²	5,484	1,221	171
	Malheur	5,774	1,322	207
Total Proposed Route		20,472	4,745	733
Percent of Site Boundary		100	23	3
Alternative Routes				
West of Bombing Range Road Alternative 1	Morrow	–	–	–
West of Bombing Range Road Alternative 2	Morrow	–	–	–
Morgan Lake	Union	–	–	–
Double Mountain	Malheur	669	140	27

¹ Includes station acres.

² Includes rebuild segment.

2 **3.5.1 Temporary Impacts**

3 **3.5.1.1 Temporary Soil Erosion Resulting from Construction Activities**

4 Project construction activities that will affect soil erosion include clearing, grubbing, grading,
5 backfilling, and excavation along the ROW and at additional temporary workspaces. Ground
6 clearing during construction will increase the potential for erosion, especially on slopes
7 exceeding 25 percent. Removal of protective vegetation will temporarily expose soil to potential
8 wind and water erosion. Migration of Project soils could result in topsoil loss or sedimentation
9 into surface water streams or lakes, which could affect aquatic species and fisheries. Soil
10 disturbances may occur on productive soils on lands with many uses, including agricultural and
11 forested land.

12 The majority of soil erosion impacts are of limited duration, occurring predominantly during the
13 construction period, approximately 2 to 3 years. The areas used only for construction will be
14 reclaimed as soon as construction is completed in any area. Reclamation activities may include
15 re-grading to original land contours, replacing topsoil, and revegetation (see Exhibit P1,
16 Attachment P1-3, Reclamation and Revegetation Plan).

17 Table I-5 summarizes the acres within the temporary disturbance area containing highly wind
18 erodible soils, high K factor, slopes greater than 25 percent, and low soil loss tolerance.

1 **Table I-5. Erosion Factors in the Temporary Disturbance Area (acres/percent of Temporary Disturbance Area)**

Route	County	Erosion Factors							
		Highly Wind Erodible ^{2,3}		High K Factor ^{2,4}		Slope Greater Than 25% ⁶		Low T Factor ^{2,5}	
		Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent
Proposed Route	Morrow ¹	347	55	444	70	–	–	287	45
	Umatilla	147	21	676	94	65	9	388	54
	Union	79	11	446	64	–	–	299	43
	Baker	-	-	361	35	391	38	614	59
	Malheur	603	45	555	41	121	9	745	56
Total Proposed Route		1,220	25	2,483	50	578	12	2,833	57
Alternative Routes									
West of Bombing Range Road Alt 1	Morrow	32	100	32	100	–	–	–	–
West of Bombing Range Road Alt 2	Morrow	22	100	22	100	–	–	–	–
Morgan Lake	Union	79	21	222	60	–	–	158	43
Double Mountain	Malheur	46	29	46	29	–	–	111	71

¹ Includes station acres.

² Source: STATSGO data.

³ Highly wind erodible include STATSGO wind erodibility classes 1 through 4 (wind erosion greater than or equal to 86 tons per acre per year).

⁴ High K factor defined as K factor greater than or equal to 0.37.

⁵ Lot T factor defined as T factor less than or equal to 2 tons per acre per year.

⁶ Source: USGS National Elevation Dataset database.

1 3.5.1.2 Temporary Soil Compaction Resulting from Construction Activities

2 Project-related soil compaction will occur in temporary disturbance areas. Soil compaction occurs
3 due mainly to the weight of construction equipment and vehicles driving on native soil. Areas under
4 roadways, structures, and high-use areas would be most susceptible to soil compaction.

5 All soils have at least some potential for soil compaction. However, different soil types have
6 different susceptibility to compaction. Dry, poorly graded, non-cohesive soils, such as loose
7 sand or silt, are not readily compactible. The added weight of vehicles or equipment simply
8 results in the loose soil grains moving to points of less pressure. On the other hand, fine-grained
9 clay or other poorly drained, cohesive soils have the greatest potential for soil compaction.
10 These soils are considered highly compactible.

11 Over-compaction of soil affects the soil's potential for erosion and reclamation. Soil compaction
12 can increase overland flow of rainwater or snow melt, increasing erosion potential. Over
13 compacted soil reduces the amount of water infiltration necessary to support plant growth.
14 Compacted soil is also less suitable to natural plant regeneration or seeding.

15 The NRCS STATSGO soil properties were reviewed within the Site Boundary. No soil was
16 detected with the combination of fine grain size, and poor drainage characteristics that would
17 result in classification as highly compactible. Therefore, no areas within the temporary
18 disturbance area were identified as needing special considerations for soil compaction.

19 3.5.1.3 Temporary Soil Impacts Resulting from Reclamation Activities

20 Construction activities will result in the need for reclamation in temporary disturbance areas, and the
21 reclamation activities themselves may result in temporary soil impacts. Some soil compaction will
22 occur within the disturbed areas due to the movement of heavy equipment over the soil. Areas
23 under roadways, structures, and high-use areas will be most affected. Compaction will be greatest
24 in those areas containing compaction prone soils, such as very fine-grained, poorly drained soils.
25 Although no areas within the temporary disturbance area were identified as needing special
26 considerations for soil compaction, all soil will have some potential for soil compaction, and
27 compacted soil will need to be ripped, loosened, or otherwise treated using BMPs at the end of the
28 Project to restore their productivity.

29 If extensive construction blasting is necessary, the amount of stony-rocky soils will increase as
30 blasted rock is incorporated into nearby soils. Several soil properties affect the ability to conduct soil
31 reclamation and especially reestablishment of vegetation, including the amount of stony-rocky soil
32 and droughty soil. The amount of shallow bedrock can also affect the success of soil reclamation.

33 Stony-rocky soils contain high percentages coarse soil fragments, such as sand and gravel. Stony-
34 rocky soil does not retain moisture as well as fine-grained soil, and is poor in providing soil nutrients
35 to new or established vegetation. Droughty soil is similarly coarse textured (sandy loam or coarser)
36 and excessively well-drained. Revegetation in stony-rocky or droughty soils will require selection of
37 drought-resistant species, seasonal planting at times when moisture is likely, and possible mulching,
38 watering, or soil amendments.

39 The soil properties affecting reclamation are of longer duration than impacts from erosion. Droughty
40 soils are not as favorable for revegetation, and reclamation in droughty soil will be more difficult
41 when compared to non-droughty soil. The impacts from stony-rocky soil, including possible increase
42 in stony-rocky soil from blasting are also a long-term soil condition that could prolong the time to
43 achieve successful reclamation.

44 Table I-6 summarizes the soil factors that could affect soil reclamation for the Project, including
45 stony-rocky soil, droughty soil, shallow bedrock, and hydric soil.

1 **Table I-6. Soil Reclamation Factors in Temporary Disturbance Area (acres/percent of Temporary Disturbance**
 2 **Area)**

Route	County	Stony/Rocky ^{2,3}		Droughty ^{2,4}		Shallow Bedrock ^{2,5}		Hydric Soil ⁶	
		Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent
Proposed Route	Morrow ¹	72.4	11.4	248.0	39.1	492.7	77.8	–	–
	Umatilla ¹	183.5	25.7	221.2	31.0	631.7	88.5	69.4	9.7
	Union	527.0	75.6	527.0	75.6	605.5	86.9	56.7	8.1
	Baker	877.6	84.4	877.6	84.4	614.2	59.1	44.1	4.2
	Malheur	738.9	55.1	935.6	69.7	831.7	62.0	36.8	2.7
Total Proposed Route		2,399.4	48.3	2,809.3	56.6	3,175.8	71.75	207.0	4.2
Alternative Routes									
West of Bombing Range Road Alt 1	Morrow	–	–	31.7	100	31.7	100	–	–
West of Bombing Range Road Alt 2	Morrow	–	–	22.4	100	22.4	100	–	–
Morgan Lake	Union	250.5	68.2	250.5	68.2	329.0	89.6	39.3	10.7
Double Mountain	Malheur	110.7	70.6	111.8	71.3	111.8	71.25	–	–

¹ Includes station acres.

² Source: STATSGO data.

³ Stony rocky soil is defined as soil with at least 20 percent of soil particles with size greater than 2 mm.

⁴ Droughty soils are defined as soil with sandy loam or coarser texture, and drainage class of moderately to excessively well-drained.

⁵ Shallow bedrock is defined as bedrock occurring within 51 inches of ground surface.

⁶ Source for hydric soil is SSURGO database and Oregon Wetland Database from the Oregon Spatial Data Library (2013).

Note: SSURGO and STATSGO databases did not contain any highly compactable soil within analysis area; therefore, highly compactable soil is not shown on this table.

1 During operations, maintenance or repair activities may also require reclamation in small areas
 2 in or around the Project features. The impacts resulting from operation-related reclamation
 3 activities will be similar to those described above for construction-related reclamation, only on a
 4 much smaller scale. IPC expects only minor, insignificant reclamation activities during the
 5 operations phase.

6 3.5.1.4 Temporary Soil Impacts Specific to Productive Soils

7 The analysis provided in Section 3.2.5 provides an estimate of the amount of land within the
 8 analysis area that includes current land uses requiring or depending on productive soils, based
 9 on high value farmland soils and land cover types. Temporary soil disturbances will likely occur
 10 on productive soils within the temporary disturbance area. Potential soil impacts to productive
 11 soils used for agriculture and forested areas include soil erosion, damage to the agricultural land
 12 drainage and irrigation systems, mixing of topsoil and subsoil, potential loss of topsoil, and soil
 13 compaction. Agricultural land within the temporary disturbance area will be unavailable to
 14 agriculture during construction. Construction on soil with low soil loss tolerance may cause
 15 erosion on soil not well suited to soil loss. Construction areas not also used for operations will
 16 be reclaimed as soon as possible following construction. For seasonal crops, soil could be
 17 suitable within a growing season of construction completion. Forested areas may also be
 18 suitable for replanting of tree species within a growing season. However, the transmission line
 19 ROW will not be suitable for tree growth as long as the Project remains in service. The flight
 20 paths of crop dusting aircraft may have to be modified or restricted in agricultural areas adjacent
 21 to the transmission line.

22 A review of the databases used to estimate current land uses that require or depend on
 23 productive soils, including high value farmland soils and land cover types, allows for estimates of
 24 the acres of productive soils that may be impacted during construction (see Tables I-7 and I-8).

25 **Table I-7. Temporary Impacts to High Value Farmland Soils**

Route	County	High Value Farmland Soils (acres) ²	% of Temporary Disturbance Area in High Value Farmland Soils	% of Temporary Impacts to High Value Farmland Soils relative to total countywide High Value Farmland Soils
Proposed Route	Morrow ¹	260	41	0.09
	Umatilla	103	14	0.02
	Union	126	18	0.1
	Baker	32	3	0.09
	Malheur	43	3	0.03
Total Proposed Route		564	11	0.05
Alternative Routes				
West of Bombing Range Road Alt 1	Morrow	11	35	<0.01
West of Bombing Range Road Alt 2	Morrow	6	28	<0.01
Morgan Lake	Union	73	20	0.06
Double Mountain	Malheur	–	–	–

¹ Includes station acres.

² Source: SSURGO database.

³ Percentage not calculated as alternative route is located in both Baker and Malheur counties.

1 Table I-8. Land Cover Types within the Temporary Disturbance Area

Route	County	Temporary Disturbance Area (acres)	Developed (acres) ²	Bare Ground (acres) ²	Cultivated Cropland (acres) ²	Forest/Woodland (acres) ²	Open Water (acres) ²	Pasture/Hay (acres) ²	Shrub/Grass (acres) ²	Wetland (acres) ²
Proposed Route	Morrow ¹	633.5	3.6	–	232.5	–	1.5	2.1	393.7	–
	Umatilla	713.7	6.9	–	58.3	137.6	–	23.9	482.3	4.6
	Union	697.2	3.7	15.9	100.8	204.4	–	<0.1	364.0	8.3
	Baker	1,039.9	10.0	3.7	60.2	24.3	–	12.8	918.1	10.8
	Malheur	1,341.8	4.8	8.9	103.2	<0.1	<0.1	21.3	1,203.5	0.1
Total Proposed Route		4,426.1	29.0	28.5	555.0	366.3	1.5	60.2	3,361.6	23.8
Alternative Routes										
West of Bombing Range Road Alternative 1	Morrow	–	1.8	–	3.1	–	–	0.3	26.5	–
West of Bombing Range Road Alternative 2	Morrow	–	1.2	–	1.4	–	–	0.1	19.8	–
Morgan Lake	Union	–	1.2	0.4	79.9	146.0	–	–	136.7	2.9
Double Mountain	Malheur	–	–	–	–	–	–	–	156.9	–

¹ Includes station acres.

² Source: USDA ReGAP database.

1 3.5.1.5 Temporary Soil Impacts Resulting from Herbicide Use

2 Up to approximately 200 gallons of herbicides may be stored at multi-use areas (approximately
3 6.45 gallons per multi-use area) and used on-site to limit vegetation beneath transmission lines
4 and to control infestations of weedy species or noxious weeds during construction (see
5 Exhibit G, Table G-3a). Herbicides may be applied using a broadcast applicator mounted on a
6 truck or all-terrain vehicle, backpack sprayers, or with hand sprayers as conditions dictate.
7 Herbicide applications will be conducted by licensed operators or under the supervision of a
8 licensed operator in accordance with state laws. All herbicide applications will comply with label
9 restrictions, federal, state, and/or county regulation, and landowner agreements. No spraying
10 will occur prior to notification and approval from the applicable land management agency or
11 landowner. Private property will be sprayed only following written permission. State and federal
12 herbicide recording requirements will be followed, including Bureau of Land Management (BLM)
13 and USFS requirements. The Noxious Weed Plan (Exhibit P1, Appendix P1-5) will contain a list
14 of approved herbicides, target species, and application times and rates. Herbicide use during
15 operations will be similar to what is described here. However, herbicides will not be stored on
16 the Project during operations, but brought in and applied on an as-needed basis to control
17 infestations of weedy species or noxious weeds.

18 Soil treated with herbicides may require some interval following application before suitable or
19 favorable vegetation can be re-established. However, land management agency-approved
20 herbicides used per manufacturers' guidance, and applied at the appropriate concentrations will
21 not result in permanent damage to soil. Additional information on noxious weed and vegetation
22 management, including application of herbicides is presented in the Noxious Weed Plan (Exhibit
23 P1, Attachment P1-5), and the Vegetation Management Plan (Exhibit P1, Attachment P1-4).

24 3.5.1.6 Temporary Soil Impacts Resulting from Chemical Spills

25 During construction, a limited amount of hazardous substances will be used on-site, including
26 petroleum fuels, lubricants, cleaners, paints, and other common construction materials. To
27 comply with fuel storage requirements, IPC will require its construction contractor to prepare a
28 Spill Prevention, Control, and Countermeasures Plan (SPCC Plan). The SPCC Plan will comply
29 with 40 Code of Federal Regulations, Part 112, and will include site-specific implementation of
30 cleanup procedures in the event of soil contamination from spills or leaks of fuels, lubricants,
31 coolants, or solvents. The SPCC Plan will identify applicable legal and contractual requirements,
32 Project-specific spill prevention procedures, and other stipulations and methods to address
33 Project spill prevention, response, and cleanup procedures (see Exhibit G, Attachment G-4).
34 IPC will fully comply with Oregon Department of Environmental Quality (ODEQ) regulations for
35 storage of hazardous materials and cleanup and disposal of hazardous waste on all lands
36 associated with the Project. Due to the procedures that IPC plans to implement during
37 construction, the Project is not expected to result in impacts from chemical spills. For additional
38 discussion regarding IPC's plans regarding spill prevention and management of hazardous
39 materials, see Exhibit G.

40 3.5.2 Permanent Impacts

41 3.5.2.1 Permanent Soil Erosion Resulting from Operations Activities

42 The soil erosion impacts during operations of the Project will be minimal. Soil erosion in the
43 permanent disturbance area will predominantly consist of soil disturbances at tower sites,
44 Longhorn station, communication stations, and/or access roads necessary to maintain the
45 transmission lines and conduct necessary repairs. Erosion impacts in the permanent
46 disturbance areas will be minor and occur only intermittently over the life of the Project.

1 The reclamation of soils from construction activities within the temporary disturbance area will
2 result in stable soils. Construction-phase reclamation will therefore reduce the potential for soil
3 erosion during Project operations. For instance, the area around the Longhorn Station site will
4 be covered with free draining rock, which will isolate native soil from erosive conditions. Access
5 roads retained for operations will be seeded with a grass mix and revegetated, thereby
6 minimizing the surface exposed to erosive conditions. For normal maintenance activities, an 8-
7 foot portion of the road will be used and vehicles will drive over the vegetation. For non-routine
8 maintenance requiring access by larger vehicles, the full width of the access road may be used.
9 Access roads will be repaired, as necessary, but will not be routinely graded so as to minimize
10 impact to vegetation.

11 Table I-9 summarizes the soil areas containing highly wind erodible soils, high K factor, slopes
12 greater than 25 percent, and low T factor soil within the permanent disturbance area. There will
13 be little or no erosional impacts during the operations phase. Stormwater mitigation measures
14 described in Section 3.6.4 will reduce or eliminate erosional impacts during operations.

15 Due to the small size of the permanent disturbance area, the reclamation that will occur
16 following construction, and the intermittent operations activities that could increase erosion,
17 impacts from erosion during the operations phase will be minimal.

1 **Table I-9. Erosion Factors in the Permanent Disturbance Area**

Route	County	Erosion Factors							
		Highly Wind ^{2,3} Erodible		High K Factor ^{2,4}		Slope Greater Than 25% ⁶		Low T Factor ^{2,5}	
		Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent
Proposed Route	Morrow ¹	64.5	50.3	78.5	61.2	–	–	63.7	49.7
	Umatilla	12.0	10.4	114.9	100.0	32.3	28.1	80.7	70.3
	Union	–	–	70.3	72.7	66.6	69.0	53.5	55.3
	Baker	–	–	80.7	41.7	70.3	36.3	133.7	69.1
	Malheur	91.9	41.1	91.5	40.9	19.6	8.8	130.6	58.4
Total Proposed Route		168.4	22.2	435.9	50.6	188.8	24.9	462.2	61.1
Alternative Routes									
West of Bombing Range Road Alt. 1	Morrow	5.1	100.0	5.1	100.0	–	–	–	–
West of Bombing Range Road Alt. 2	Morrow	3.4	100.0	3.4	100.0	–	–	–	–
Morgan Lake	Union	–	–	39.3	74.2	46.8	88.4	31.3	59.2
Double Mountain	Malheur	9.1	32.3	9.1	32.3	–	–	19.1	67.7

¹ Includes station acres.

² Source: NRCS STATSGO database.

³ Highly wind erodible include STATSGO wind erodibility classes 1 through 4 (wind erosion greater than or equal to 86 tons per acre per year).

⁴ High K factor defined as K factor greater than or equal to 0.37.

⁵ Lot T factor defined as T factor less than or equal to 2 tons per acre per year.

⁶ Source: USGS National Elevation Dataset database.

1 3.5.2.2 Permanent Soil Impacts Specific to Productive Soils

2 There will be some permanent loss of productive soils in the areas of permanent soil
 3 disturbance due to replacement of productive land with Project features. The predominant land
 4 loss is placement of permanent structures on formerly productive land, including the Longhorn
 5 Station, tower foundations, communication stations, and access roads, which will result in a
 6 long-term loss of that acreage under these features. Utilization of these areas within the
 7 permanent disturbance area was assumed to result in “permanent” soil loss because the Project
 8 will likely persist indefinitely. However, it is not irreversible, and in the unlikely event that the
 9 Project is decommissioned, those areas will be reclaimed for other beneficial uses.

10 Table I-10 shows the limited amount of impact the Project will have on high value farmland soils
 11 during operation of the Project. The operations phase of the Project will result in an insignificant
 12 loss to high value farmland soils, averaging less than 0.01 percent of the acreage of high value
 13 farmland soils per county.

14 **Table I-10. Permanent Impacts to High Value Farmland Soils**

Route	County	Permanent Disturbance Area High Value Farmland Soils ² (acres)	% of Permanent Disturbance Area in High Value Farmland Soils	% of Permanent Impacts to High Value Farmland Soils Relative to Total Countywide High Value Farmland Soils
Proposed Route	Morrow ¹	37.4	29.0	<0.1
	Umatilla	12.9	11.0	<0.1
	Union	2.9	3.0	<0.1
	Baker	1.6	0.8	<0.1
	Malheur	3.0	1.0	<0.1
Total Proposed Route		58.0	7.0	<0.1
Alternative Routes				
West of Bombing Range Road Alt. 1	Morrow	1.9	37.0	<0.1
West of Bombing Range Road Alt. 2	Morrow	0.7	21.0	<0.1
Morgan Lake	Union	0.2	<0.1	<0.1
Double Mountain	Malheur	–	–	–

¹ Includes station acres.

² Source: SSURGO database.

³ Percentage not calculated as alternative route is located in both Baker and Malheur counties.

15 Table I-11 presents the land cover types within the permanent disturbance area by Project route
 16 and county. The land cover types that could be impacted are the same in the permanent
 17 disturbance area as in the temporary disturbance area. These land uses include cultivated
 18 cropland and shrub/grass in Morrow County, cultivated cropland, forest/woodland, irrigated
 19 agriculture, pasture/hay and shrub/grass in Umatilla County, forest/woodland and shrub/grass in
 20 Union County, and cultivated cropland, irrigated agriculture and shrub/grass in Baker and
 21 Malheur counties.

1 **Table I-11. Land Cover Types within the Permanent Disturbance Area**

Route	County	Developed (acres) ²	Bare Ground (acres) ²	Cultivated Cropland (acres) ²	Forest/Woodland (acres) ²	Open Water (acres) ²	Pasture/Hay (acres) ²	Shrub/Grass (acres) ²	Wetland (acres) ²
Proposed Route	Morrow ¹	0.8	–	45.4	–	0.1	1.0	80.9	–
	Umatilla	2.4	–	11.8	20.9	–	4.8	73.0	2.0
	Union	0.7	0.3	1.1	32.8	–	<0.1	59.7	2.2
	Baker	0.9	0.9	3.0	6.8	–	1.0	180.7	0.2
	Malheur	0.4	0.4	5.4	<0.1	–	5.8	211.0	0.1
Total Proposed Route		5.25	1.6	66.7	60.5	0.1	12.6	605.3	4.5
Alternative Routes									
West of Bombing Range Road Alt. 1	Morrow	0.5	–	0.5	–	–	0.1	4.0	–
West of Bombing Range Road Alt. 2	Morrow	0.4	–	0.4	–	–	<0.1	2.6	–
Morgan Lake	Union	<0.1	0.1	0.1	29.9	–	–	21.5	1.2
Double Mountain	Malheur	–	–	–	–	–	–	28.2	–

¹ Includes station acres.

² Source: USDA ReGAP database.

2 **3.5.3 Retirement Phase Impacts**

3 The Project is designed to last indefinitely with proper maintenance and replacement of
4 components as needed. However, in the unlikely event that the Project is decommissioned, it
5 will result in temporary soil impacts of approximately the same magnitude as during
6 construction; therefore, the same practices used during construction to minimize impacts to the
7 soil will be used during decommissioning activities. All transmission line structures and
8 associated features will be removed, and disturbed areas will be reclaimed. Decommissioning
9 activities will include excavation to remove structures. This will temporarily expose bare soil to
10 erosional impacts. Grading may be used to restore natural land contours, or to spread
11 stockpiled topsoil onto reclaimed land. Reclaimed roads will be ripped to reduce compaction as
12 described in the Reclamation and Revegetation Plan (Exhibit P1, Attachment P1-3). During
13 decommissioning, those areas with “permanent” topsoil removal will be reclaimed, and
14 revegetated to preconstruction conditions. These activities will result in temporary exposure of
15 bare soil to increased erosion.

16 **3.5.4 Soil Impact Summary**

17 The temporary disturbance may result in increased erosion, soil compaction, loss of soil
18 productivity and/or the need for soil reclamation. Disturbed soils will include productive soils
19 used for agriculture, timber production, and grazing. These soil disturbances will be mitigated
20 through the measures described below. The permanent disturbance area will result in a direct
21 loss of productive soil due to placement of permanent Project features; however, soil erosion
22 and soil reclamation will be minimal during Project operations as discussed above. The Project
23 is not expected to be retired. However, the amount of soil disturbance during retirement would
24 be approximately equal to the amount of disturbance required during construction. Retirement
25 disturbance would require similar mitigation measures to those needed during and following
26 construction.

3.6 Mitigation Measures and No Adverse Impacts

OAR 345-021-0010(1)(i)(D): A description of any measures the applicant proposes to avoid or mitigate adverse impact to soils.

OAR 345-022-0022: To issue a site certificate, the Council must find that the design, construction and operation of the facility, taking into account mitigation, are not likely to result in a significant adverse impact to soils including, but not limited to, erosion and chemical factors such as salt deposition from cooling towers, land application of liquid effluent, and chemical spills

3.6.1 Avoidance of Sensitive Soils

The Supplemental Siting Study (see Exhibit B, Attachment B-2) evaluated numerous constraints, including soil properties and agricultural land uses throughout selection of the Proposed Route. Soil-related constraints included hydric soils, steep terrain, prime farmlands, and landslide information from the Statewide Landslide Inventory Database for Oregon. As part of the siting process, IPC communicated with local, state, and federal entities, landowners, and other stakeholders to obtain input to minimize Project impacts to irrigated agricultural lands and other sensitive resources. In response to stakeholder communications, the Proposed Route has shifted and an alternative route has been included for consideration.

IPC's engineers conducted engineering design studies. An Engineering Geology and Seismic Hazards Supplement (see Exhibit H, Attachment H-1) has been prepared, incorporating geologic hazard and soil data from many sources. The engineers have also conducted a reconnaissance review of the entire Proposed Route for unstable land conditions, incorporating review of the Statewide Landslide Inventory Database for Oregon database with aerial imagery review and site visits to landslides and unstable landforms. Results of this reconnaissance are included in the desktop survey. Transmission line routes, access roads and other Project features have been located and designed to avoid impacts to unstable or landslide-prone soils where possible. The Project will use existing roads to access Project sites to the extent practicable; where needed, existing roads will be improved to reduce sediment generation and minimize impacts to soils.

Results of further engineering evaluations will be used to provide micrositing and design of Project structures that protect the public and minimize construction on unstable soil surfaces. Additional soil data will be collected during the site-specific geotechnical evaluation. The engineers have preliminarily proposed 469 boreholes at regular intervals along the Project route to further evaluate soil conditions. A description of proposed geotechnical investigation tasks appears in Exhibit H.

Additional soil analysis will be conducted during the final geotechnical exploration program (see Exhibit H, Attachment H-1) to assist in preparing detailed foundation designs and erosion and sediment control measures. The potential sensitivity of soils will be considered in design and siting.

3.6.2 Minimize Soil Impacts with Best Management Practices

Localized impacts to soils at and around tower locations, access roads, fly yards, and facility footprints in the temporary disturbance area will be minimized through the use of BMPs and restoration efforts to restore soil surfaces and vegetation following disturbances.

Stormwater discharges from construction activities that disturb one or more acres are regulated under the Environmental Protection Agency (EPA) National Pollutant Discharge Elimination

1 System (NPDES) stormwater program. Prior to discharging stormwater, construction operators
2 must obtain coverage under an NPDES permit. Oregon is authorized by the EPA to implement a
3 statewide stormwater program under the NPDES. The ODEQ Stormwater Program has permits
4 and requirements modeled after EPA's NPDES program. ODEQ will require adherence to
5 NPDES stormwater requirements, submittal of a 1200-C construction stormwater permit
6 application, and preparation of an ESCP that describes construction activities and methods
7 proposed to comply with stormwater requirements. IPC will obtain an NPDES 1200-C
8 Stormwater Construction Permit, and will implement an ESCP. IPC proposes a generic set of
9 construction BMPs to be available for use on a majority of the Project where soils are not highly
10 erosive, slopes are not steep, and construction is away from surface water. More specific BMP
11 methods and BMP locations will be designated in areas with higher potential for soil erosion
12 impacts. Where steep slopes cannot be avoided, site-specific BMPs tailored to encountered soil
13 types in those areas will be applied to control and reduce erosion. The ESCP will present
14 appropriate BMPs for minimizing impacts in areas with steep slopes. No construction will occur
15 until the 1200-C stormwater permit has been obtained and the ESCP has been finalized and
16 approved by ODEQ. A draft version of the ESCP is included in Attachment I-3. Attachment I-4
17 contains a letter from ODEQ acknowledging receipt of the preliminary 1200-C permit application
18 and draft ESCP.

19 Reclamation will be necessary in disturbed soil areas. The draft Reclamation and Revegetation
20 Plan (see Exhibit P1, Attachment P1-3) presents the measures that IPC will use for reclamation
21 and revegetation such as recontouring, scarification, soil replacement, seedbed preparation,
22 fertilization, seed mixtures, seeding timing, seeding methods, supplemental wetland and riparian
23 plantings and supplemental forest plantings to ensure reclamation success. To ensure the
24 protective measures set forth in the draft Reclamation and Revegetation Plan are incorporated
25 into the final Reclamation and Revegetation Plan and to ensure compliance with the final
26 Reclamation and Revegetation Plan, IPC proposes that the Energy Facility Siting Council
27 (EFSC or Council) include the following condition in the site certificate providing for the same:

28 ***Fish and Wildlife Condition 4:*** *Prior to construction, the site certificate holder*
29 *shall finalize, and submit to the department for its approval, a final Reclamation*
30 *and Revegetation Plan. The protective measures described in the draft*
31 *Reclamation and Revegetation Plan in ASC Exhibit P1, Attachment P1-3, shall*
32 *be included and implemented as part of the final Reclamation and Revegetation*
33 *Plan, unless otherwise approved by the department.*

34 ***Fish and Wildlife Condition 17:*** *During construction, the site certificate holder*
35 *shall conduct all work in compliance with the final Reclamation and Revegetation*
36 *Plan referenced in Fish and Wildlife Condition 4.*

37 **3.6.3 Minimizing Impacts of Spills**

38 The draft SPCC Plan details IPC's plans to manage hazardous substances during construction,
39 including measures to prevent and contain spills. The draft SPCC Plan identifies Project-specific
40 spill prevention procedures and other stipulations and methods to address Project spill
41 prevention, response, and cleanup procedures, including but not limited to the following:

- 42 • Transfer of liquids and refueling will occur only at approved locations that are at least
43 100 feet away from any wetlands or surface waters, 200 feet from any private water well,
44 and 400 feet from any municipal or community water well, with certain exceptions noted
45 below.
- 46 • Crews must have adequate spill response equipment available at the dispensing or
47 transfer location.

- 1 • When materials are stored in a fuel storage tank, the Contractor will locate the tank at
2 least 100 feet from wetlands, 200 feet from private water wells, and 400 feet from
3 municipal water supply wells, with certain exceptions noted below; install a temporary
4 earthen berm around the tank and line it with plastic to provide containment; inspect the
5 tank, berm, and liner daily; inspect the tank after refilling; correct any conditions that
6 could result in a spill, leak, or compromise the integrity of the secondary containment;
7 and plug or close all tank openings when not in use.
- 8 • Only a fuel truck with a maximum of 300 gallons of fuel may enter restricted areas to
9 refuel construction equipment. Two trained personnel will be present during refueling to
10 reduce the potential for spill or accidents.

11 To ensure the protective measures set forth in the draft SPCC Plan are incorporated into the
12 final SPCC Plan and to ensure compliance with the final SPCC Plan, IPC proposes that the
13 Council include the following conditions in the site certificate providing for the same:

14 **Soil Protection Condition 1:** *Prior to construction, the site certificate holder*
15 *shall submit to the department a copy of an Oregon Department of*
16 *Environmental Quality (ODEQ)-approved construction-related final Spill*
17 *Prevention, Control, and Countermeasures Plan (SPCC Plan). The protective*
18 *measures described in the draft SPCC Plan in ASC Exhibit G, Attachment G-4,*
19 *shall be included as part of the construction-related final SPCC Plan, unless*
20 *otherwise approved by the department.*

21 **Soil Protection Condition 4:** *During construction, the site certificate holder shall*
22 *conduct all work in compliance with the construction-related final SPCC Plan*
23 *referenced in Soil Protection Condition 1.*

24 IPC does not anticipate that it will need a SPCC Plan for any of the Project facilities or activities
25 during operations, except possibly at the Longhorn Station if IPC and not BPA operates the
26 Longhorn Station. To ensure operations are covered by an SPCC Plan, if necessary, IPC
27 proposes that the Council include the following conditions in the site certificate:

28 **Soil Protection Condition 7:** *Prior to operation, if the site certificate holder is required*
29 *by ODEQ statutes or rules to implement a SPCC Plan for operation of the facility, the*
30 *site certificate holder shall submit to the department a copy of an ODEQ-approved*
31 *operation-related SPCC Plan.*

32 **Soil Protection Condition 8:** *During operation, the site certificate holder shall*
33 *conduct all work in compliance with the operation-related SPCC Plan referenced*
34 *in Soil Protection Condition 7, if applicable.*

35 Explosives (considered a class of hazardous material) will be used for blasting rock where
36 needed. Explosive line hardware will be used to terminate and splice the conductor. The use,
37 storage, and other details pertaining to the use of explosives will be conducted in accordance
38 with the Framework Blasting Plan (Exhibit G, Attachment G-5). The Framework Blasting Plan
39 describes the procedures, safety measures, and monitoring that the Contractor will adhere to
40 while implementing activities during construction of the Project. The procedures include
41 measures to secure the storage area from theft and control access to the material to ensure the
42 protection of public health and safety. All explosive storage facilities and employees handling
43 explosives will meet all necessary Bureau of Alcohol, Tobacco, Firearms, and Explosives
44 requirements. Regulated blasting materials will be stored in accordance with the National Fire
45 Protection Association 495: Explosive Materials Code and OAR 837-012-1340. Any relocation
46 of explosives will be reported to the Office of the State Fire Marshal as required by OAR 837-

1 012-1360. The Framework Blasting Plan will be updated following site-specific geotechnical
2 investigation. In addition, the Contractor will be required to submit a detailed blasting plan
3 (Contractor's Blasting Plan) to IPC that is consistent with the provisions in the Framework
4 Blasting Plan. To ensure proper management of hazardous substances during construction and
5 operation, IPC proposes that the Council include the following conditions in the site certificate:

6 **Soil Protection Condition 2:** *Prior to construction, the site certificate holder*
7 *shall finalize, and submit to the department for its approval, a final Blasting Plan.*
8 *The protective measures described in the draft Blasting Plan in ASC Exhibit G,*
9 *Attachment G-5, shall be included as part of the final Blasting Plan, unless*
10 *otherwise approved by the department. The final Blasting Plan shall meet the*
11 *requirements of the Oregon State Police – Oregon Office of State Fire Marshal*
12 *for the transportation, storage, and use of explosives.*

13 **Soil Protection Condition 5:** *During construction, the site certificate holder shall*
14 *conduct all work in compliance with the final Blasting Plan referenced in Soil*
15 *Protection Condition 2.*

16 **3.6.4 Mitigation of Soil Erosion by Water**

17 Erosion control measures will be designed with attention to the potential soil erosion impacts
18 described in Section 3.5.1.1, with particular attention to areas containing highly wind erodible
19 soils, high K factor soil, slopes greater than 25 percent, and low T factor soils. Work on access
20 roads will include grading and re-graveling of existing roads and construction of new roads. Soil
21 erosion will be minimized by constraining traffic, heavy equipment, and construction to existing
22 roads where possible. Where new road construction is required, road widths will be limited to
23 the width necessary to accommodate the construction equipment. New roads will be located to
24 avoid steep areas as much as possible. In addition, roads will be constructed so that proper
25 drainage is not impaired and soil erosion is minimized. IPC's construction contractor will limit the
26 use of access roads by trucks and other heavy equipment during wet weather. Existing culverts
27 will be upgraded if they are damaged by the Project or cannot support construction traffic.

28 Areas impacted by construction will be reseeded and landscaped with vegetation to minimize
29 erosion and restore the systems to their natural state. Temporary ditches, sediment fences, and
30 silt traps will be installed as defined by the ESCP. Erosion control measures will remain intact
31 until natural vegetation is sufficient to protect against erosion. The Longhorn Station area will be
32 graded and landscaped to prevent soil erosion during operation.

33 Erosion and sediment control measures will meet local, county, state, and federal guidelines.
34 Detailed information about applicable regulations and guidelines is presented in the Project
35 ESCP. ODEQ guidelines are described in the Erosion and Sediment Control Manual (ODEQ
36 2005). The manual was prepared primarily to support development of stormwater BMPs for
37 construction sites requiring compliance with the 1200-C General Permit.

38 General erosion and sediment control measures to be implemented during Project construction
39 include:

- 40 • Scheduling to avoid earth-disturbing activities during wet weather;
- 41 • Work area sediment controls;
- 42 • Storm drain inlet protection; and
- 43 • Non-stormwater pollution controls, such as materials use and waste management
44 BMPs, covering or otherwise protecting stockpiles, and runoff and erosion prevention
45 measures for slopes susceptible to erosion.

1 Specific erosion and sediment control measures and BMPs to be implemented during Project
2 construction and operations include the following:

- 3 • Seeding and Stabilization: Seeding for permanent stabilization will be performed in all
4 areas where land disturbance has occurred. If topsoil is removed, care will be taken to
5 ensure it is not mixed with the underlying subsoil. Topsoil will be stored in a separate
6 stockpile. It will be returned to the area it was taken from and will not be spread in
7 adjacent areas. Seeding will be evaluated for success of establishment after two growing
8 seasons. Areas where adequate cover has not been established will be re-seeded.
- 9 • Silt Fencing: Silt fences will be inspected and repaired or replaced as necessary.
10 Trapped sediment will be removed before it reaches one-third of the aboveground fence
11 height. Once the drainage area has become permanently stabilized, the fence materials
12 and sediment deposits will be removed. The disturbed area will then be graded and
13 seeded.
- 14 • Vegetation Buffers: Vegetation buffers will be used to treat sheet flow from adjacent
15 surfaces by slowing runoff velocities and allowing sediment and other pollutants to settle
16 and partially infiltrate into underlying soils. Vegetation buffers will be inspected as
17 necessary to ensure uniform sheet flow and minimize any development of channels.
- 18 • Temporary Construction Entrances: Temporary construction entrance gravel pads will be
19 maintained in a condition to prevent mud and sediment from leaving the construction
20 site. After each rainfall, structures used to trap sediment will be inspected and cleaned
21 out as necessary.
- 22 • Concrete Washouts: Concrete washouts will be sited away from waterbodies. They will
23 be installed prior to any concrete placement on the site. They will be repaired, enlarged,
24 or cleaned out as necessary to maintain capacity for wasted concrete. They will be
25 inspected at least weekly when actively used and covered as necessary to avoid
26 overflow during storms.

27 To ensure the protective measures set forth in the draft ESCP are incorporated into the final
28 ESCP and to ensure compliance with the final ESCP, IPC proposes that the Council include the
29 following conditions in the site certificate providing for the same:

30 **Soil Protection Condition 3:** *Prior to construction, the site certificate holder*
31 *shall submit to the department a copy of an ODEQ-approved construction-related*
32 *final Erosion and Sediment Control Plan (ESCP). The protective measures*
33 *described in the draft ESCP Plan in ASC Exhibit I, Attachment I-3, shall be*
34 *included as part of the construction-related final ESCP Plan, unless otherwise*
35 *approved by the department.*

36 **Soil Protection Condition 6:** *During construction, the site certificate holder shall*
37 *conduct all work in compliance with the final ESCP referenced in Soil Protection*
38 *Condition 3.*

39 For roads, IPC will reduce soil erosion by constructing roads with frequent road drainage
40 structures, maintaining those structures as needed, avoiding locations that generate more road
41 surface and ditch runoff, reducing the frequency of road grading, closing access roads to the
42 public where possible, and using effective erosion control measures (see ESCP in
43 Attachment I-3). Roads retained for operations will be seeded and revegetated pursuant to the
44 Reclamation and Revegetation Plan (Exhibit P1, Attachment P1-3), which will limit surface
45 erosion, and vehicles will drive over the vegetation. Access roads also will be repaired, as

1 necessary, but not routinely graded. The small amount of traffic on permanent access roads
2 during maintenance activities and inspections is not anticipated to result in soil erosion.

3 **3.6.5 Mitigation for Wind Erosion**

4 Wind erodibility is measured in average soil loss per year. However, the wind erodibility likely
5 varies seasonally in response to soil moisture, summer heating, and similar climate factors. To
6 mitigate the risk of accelerating soil erosion by wind in areas identified with wind erodibility
7 groups 1 through 4,² IPC will implement reseeding efforts, apply mulch, and water for dust
8 control to minimize potential erosion by wind on the disturbed soils during construction and over
9 the long term. Areas susceptible to wind erosion that will be disturbed by construction activities
10 and not permanently covered by aboveground facilities will be vegetated using a seed mixture
11 specified by the ODA, BLM, USFS, or other agencies as being capable of surviving in local
12 conditions and withstanding burial and deflation from wind processes. Native species will be
13 used and, if any non-native species are required for specific problem areas, species will be
14 selected that will not become nuisance species to the surrounding areas.

15 Disturbed areas susceptible to wind erosion will be hydroseeded when temperatures and
16 moisture levels are conducive to seed germination.

17 **3.6.6 Mitigation for Soil Compaction**

18 STATSGO soil data suggest that highly compactible soils are generally not present in the
19 analysis area. However, IPC will minimize soil compaction, rutting, and structural damage by
20 avoiding activities when soils are wet as described in Exhibit K, Attachment K-1, Agricultural
21 Lands Assessment. To the extent possible, mechanized clearing and maintenance will occur in
22 late summer and early fall months. Regrading, recontouring, scarifying, and final cleanup
23 activities after construction will mitigate potential soil compaction.

24 However, because all soil has at least some potential for soil compaction, BMPs will be applied
25 following construction to rip, loosen, or otherwise relieve soil compaction to restore the
26 productive potential for soil in temporary disturbance areas.

27 Soil compaction will not be significant during operations. Travel is infrequent and mostly on
28 already established travelways. Mitigation for soil compaction would typically not be necessary
29 during the operations phase. However, if short-term repair of a particular area were required,
30 local soil loosening may be necessary to facilitate reclamation at the end of the repair interval.
31 Although decommissioning is not planned, impacts from soil compaction during
32 decommissioning will be similar to those in the construction phase.

33 **3.6.7 Soil Revegetation and Reclamation**

34 After completion of construction activities, compacted soils in non-agricultural areas will be
35 mechanically loosened where necessary. Previously stockpiled and salvaged topsoil will be
36 replaced, and vegetation reestablished as appropriate for the location. In cropped agricultural
37 areas, IPC will work in consultation with local landowners and agricultural operators to restore

² Wind Erodibility Groups are defined as: Group 1 – Very fine sand, fine sand, sand or coarse sand; Group 2 – Loamy very fine sand, loamy fine sand, loamy sand, and loamy coarse sand; very fine sandy loam and silt loam with 5 or less percent clay and 25 or less percent very fine sand; and sapric soil materials (as defined in Soil Taxonomy); except Folists; Group 3 – Very fine sandy loam (but does not meet WEG criterion 2), fine sandy loam, sandy loam, and coarse sandy loam; noncalcareous silt loam that has greater than or equal to 20 to less than 50 percent very fine sand and greater than or equal to 5 to less than 12 percent clay. Group 4 – Clay, silty clay, noncalcareous clay loam that has more than 35 percent clay and noncalcareous silty clay loam that has more than 35 percent clay; all of these do not have sesquic, parasesquic, ferritic, ferruginous, or kaolinitic mineralogy (high iron oxide content) (see https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/?cid=nrcs142p2_054224#95).

1 crops or replace productive soil to the extent practicable. Slopes and cut banks will be stabilized
2 with riprap and/or planted or seeded with vegetation, and Project facilities will be monitored and
3 maintained to prevent erosion for the life of the Project. Revegetation actions and activities will
4 be presented as part of the Project's Vegetation Management Plan (see Exhibit P1, Attachment
5 P1-4).

- 6 • **Shallow Bedrock:** Restoration of soils with exposed bedrock or shallow bedrock may
7 require adaptive seed mixtures and implementation of revegetation practices (i.e.,
8 fertilization, mulching, monitoring) to enhance revegetation success. Revegetation of
9 areas with extensive rock outcrop may not be possible.
- 10 • **Droughty Soils:** Droughty soils may not hold enough water within the root zone to
11 support plant life, making revegetation difficult. In areas of droughty soils, the soil
12 surfaces will be mulched and stabilized to minimize wind erosion and to conserve soil
13 moisture.
- 14 • **Large Stones:** Rocks excavated during foundation work will be kept separate from
15 topsoil during construction and during surface preparation as part of restoration. The
16 rock removed during construction will be moved to designated onsite locations.
- 17 • **High Water Table:** Depending on the specific time of construction, dewatering may be
18 required for foundation installation in areas with shallow saturated soil zones. Water
19 associated with dewatering will be pumped to a discharge structure that is appropriately
20 sized for the discharge volume. Water associated with dewatering will not be directly
21 discharged to water bodies. IPC will minimize the potential for dewatering by scheduling
22 the majority of construction activities during the dry season.
- 23 • **Hydic Soils:** Construction activities will include provisions for construction in areas of
24 saturated soils, such as postponing soil disturbances when soils were excessively wet.
25 The first alternative will be to avoid these areas, similar to avoiding steep slopes.
26 Mitigation measures described in IPC's ESCP will be used during construction to
27 minimize potential impacts to wetlands and hydric soils. With these measures, such as
28 segregating topsoil, leaving root systems intact during vegetation removal, using low
29 ground-weight equipment or prefabricated equipment mats, installing permanent and
30 temporary erosion control near water bodies, using breakers or sealing foundation
31 bottoms to maintain wetland hydrology, constructing during dryer seasons and
32 monitoring, impacts are not anticipated to hydric soils. In addition, Exhibit J, Attachment
33 J-3, Appendix S Site Rehabilitation Plan describes rehabilitation that would occur if
34 temporary wetland impacts were to occur.

35 To ensure the protective measures set forth in the draft Vegetation Management Plan are
36 incorporated into the final Vegetation Management Plan and to ensure compliance with the final
37 Vegetation Management Plan, IPC proposes that the Council include the following conditions in
38 the site certificate providing for the same:

39 ***Fish and Wildlife Condition 5:*** *Prior to construction, the site certificate holder*
40 *shall finalize, and submit to the department for its approval, a final Vegetation*
41 *Management Plan. The protective measures described in the draft Vegetation*
42 *Management Plan in ASC Exhibit P1, Attachment P1-4, shall be included as part*
43 *of the final Vegetation Management Plan, unless otherwise approved by the*
44 *department.*

45 ***Fish and Wildlife Condition 18:*** *During construction, the site certificate holder*
46 *shall conduct all work in compliance with the final Vegetation Management Plan*
47 *referenced in Fish and Wildlife Condition 5.*

1 ***Fish and Wildlife Condition 28:*** *During operation, the site certificate holder*
2 *shall conduct all work in compliance with the final Vegetation Management Plan*
3 *referenced in Fish and Wildlife Condition 5.*

4 The presence of some combination of stony-rocky, droughty, or shallow bedrock soil was
5 considered when designing the Reclamation and Revegetation Plan (see Exhibit P1,
6 Attachment P1-3). Reclamation predominantly occurs immediately following construction;
7 therefore, reclamation potential was not assessed for the permanent disturbance area of the
8 operations phase.

9 **3.6.8 Mitigation of Farmland and Forested Areas**

10 The impacts of the Project on farmland and forested areas will be reduced through cooperation
11 and consultation with agencies and landowners. The impacts will include lower (or no)
12 production for a short period during the construction phase. Following construction, the right-of-
13 way may continue to be used for farming practices, except where aboveground facilities will be
14 located. However, for safety and reliability reasons, trees cannot be restored beneath the
15 transmission lines. IPC will implement minimization and mitigation measures for impacts to
16 forest and farmland, such as topsoil segregation, stockpiling and salvaging (see Exhibit P1,
17 Attachment P1-3, Reclamation and Revegetation Plan). Topsoil salvaging and segregation will
18 occur in these areas to minimize potential impacts to soil and agricultural productivity.
19 Construction in active agricultural areas will be prioritized in the winter, outside of the typical
20 agricultural period, to minimize impacts to agricultural activities. The winter construction
21 schedule also will allow any irrigation canals to be crossed when they are mostly dry and out of
22 operation. The only long-term and permanent impacts to high value farmland soils from the
23 Project will be associated with the permanent infrastructure (towers, roads). Exhibit K presents
24 additional information pertaining to land use, and Exhibit K, Attachment K-1 is an Agricultural
25 Lands Assessment describing current agricultural conditions in the analysis area, including the
26 types of agriculture and the specific crops grown. Appendix B to the Agricultural Lands
27 Assessment, the Agricultural Impacts Mitigation Plan, provides additional detail regarding IPC's
28 proposed measures for mitigating impacts to productive soils and agricultural/forest operations
29 that require or depend on those soils.

30 Construction BMPs will prevent the introduction and spread of weed species in accordance with
31 the Noxious Weed Plan (Exhibit P1, Attachment P1-5). The focus of IPC's weed control efforts
32 will be to prevent the spread of noxious weeds that result from IPC's construction, operation,
33 and maintenance activities.

34 There are five noxious weed activities proposed for the Project. These include 1) inventorying
35 existing occurrence, distribution and abundance of noxious weeds prior to construction; 2)
36 monitoring and documenting the occurrence, distribution, and abundance of noxious weeds for
37 3 years following completion of construction activities; 3) reducing infestations of noxious weeds
38 caused by Project activities and preventing the spread of new and existing populations within
39 the Project area during all phases of the Project; 4) preventing any negative impacts to sensitive
40 native plant species during weed control activities; and 5) consulting and coordinating with land
41 management agencies regarding noxious weed inventory and control activities.

42 **3.6.9 Adherence to Federal Agency Land Use Plans**

43 Although not required as part of the EFSC process, applicable federal land use plans will inform
44 the development of BMPs to minimize and mitigate impacts to soils. IPC will demonstrate
45 adherence to the goals and directives of the BLM and USFS management plans for soil
46 disturbances on federal lands. Several BLM Resource Management Plans (RMPs) and the

1 Wallowa-Whitman National Forest Land and Resource Management Plan (Forest Plan; USFS
2 1990) contain requirements for minimizing erosion and maintaining productive use of soils within
3 their jurisdictions.

4 **3.6.10 Soil Mitigation Summary**

5 Soil-disturbing activities comply with state and federal planning directives. Project activities on
6 federal lands, including stormwater management implementation and reclamation, comply with
7 the BLM goals and directives found in the Baker RMP, Record of Decision (BLM 1989) and the
8 Southeastern Oregon RMP (BLM 2002). Project activities on National Forest land are consistent
9 with the Wallowa-Whitman Forest Plan (USFS 1990). Soil-disturbing activities on federal, state,
10 or private land are covered by the 1200-C stormwater permit that will be obtained prior to
11 construction activities.

12 Soil in temporary disturbance areas will be temporarily exposed to soil erosion. However, the
13 impacts of soil erosion should be minimized by implementation of the ODEQ-approved 1200-C
14 stormwater permit including stormwater BMPs described in the ESCP. Soil reclamation will
15 occur as soon as feasible after construction ends in any particular area. Reclamation efforts,
16 including minimizing Project-related soil erosion, will continue during operations in accordance
17 with the Reclamation and Revegetation Plan (Exhibit P1, Attachment P1-3) and the mitigation
18 actions outlined in Section 7.3 of the Agricultural Lands Assessment (Exhibit K, Attachment K-
19 1). Herbicide use and storage during Project operations and maintenance are described in the
20 Vegetation Management Plan (Exhibit P1, Attachment P1-4).

21 The potential soil erosion impacts during operations are negligible. Although Project retirement
22 is not anticipated, if retirement is conducted, it would be undertaken as a new construction
23 project, and a valid stormwater permit and ESCP would be in effect to reduce soil erosion. The
24 stormwater mitigation measures and reclamation efforts will result in a Project that does not
25 cause adverse impact to soil from soil erosion.

26 **3.6.11 No Adverse Impacts**

27 Taking into consideration the avoidance, minimization, and mitigation protective measures
28 provided for in the Reclamation and Revegetation Plan, SPCC Plan, ESCP, and Vegetation
29 Management Plan, the Project likely will not result in significant adverse impacts to soils (see
30 OAR 345-022-0022).

31 **3.7 Soil Monitoring**

32 OAR 345-021-0010(1)(i)(E): The applicant's proposed monitoring program, if any, for
33 adverse impact to soils during construction and operation.

34 During construction, monitoring will occur in accordance with the requirements of the
35 Reclamation and Revegetation Plan (Exhibit P1, Attachment P1-3) and the ESCP as part of the
36 1200-C stormwater permit.

37 During operations, IPC will conduct regular (generally bi-annual) inspections of the Project as
38 part of the its company-wide transmission line inspection process. If IPC identifies during a
39 regular inspection that the Project structures are resulting in erosion, IPC will take necessary
40 corrective actions and additional mitigation measures. To ensure soil impacts are monitored
41 during operations, IPC proposes the following site certificate condition:

42 **Soil Protection Condition 9:** *During operation, the site certificate holder shall*
43 *inspect the Project features for soil impacts as part of the site certificate holder's*

1 regular transmission line inspection process and shall implement corrective
2 actions and mitigation measures, if necessary.

3 **4.0 IDAHO POWER'S PROPOSED SITE CERTIFICATE CONDITIONS**

4 IPC proposes the following site certificate conditions to ensure compliance with the Soil
5 Protection Standard and other EFSC standards as indicated elsewhere in this application for
6 site certificate:

7 **Prior to Construction**

8 **Soil Protection Condition 1:** Prior to construction, the site certificate holder
9 shall submit to the department a copy of an Oregon Department of
10 Environmental Quality (ODEQ)-approved construction-related final Spill
11 Prevention, Control, and Countermeasures Plan (SPCC Plan). The protective
12 measures described in the draft SPCC Plan in ASC Exhibit G, Attachment G-4,
13 shall be included as part of the construction-related final SPCC Plan, unless
14 otherwise approved by the department.

15 **Soil Protection Condition 2:** Prior to construction, the site certificate holder
16 shall finalize, and submit to the department for its approval, a final Blasting Plan.
17 The protective measures described in the draft Blasting Plan in ASC Exhibit G,
18 Attachment G-5, shall be included as part of the final Blasting Plan, unless
19 otherwise approved by the department. The final Blasting Plan shall meet the
20 requirements of the Oregon State Police – Oregon Office of State Fire Marshal
21 for the transportation, storage, and use of explosives.

22 **Soil Protection Condition 3:** Prior to construction, the site certificate holder
23 shall submit to the department a copy of an ODEQ-approved construction-related
24 final Erosion and Sediment Control Plan (ESCP). The protective measures
25 described in the draft ESCP Plan in ASC Exhibit I, Attachment I-3, shall be
26 included as part of the construction-related final ESCP Plan, unless otherwise
27 approved by the department.

28 **Fish and Wildlife Condition 4:** Prior to construction, the site certificate holder
29 shall finalize, and submit to the department for its approval, a final Reclamation
30 and Revegetation Plan. The protective measures described in the draft
31 Reclamation and Revegetation Plan in ASC Exhibit P1, Attachment P1-3, shall
32 be included and implemented as part of the final Reclamation and Revegetation
33 Plan, unless otherwise approved by the department.

34 **Fish and Wildlife Condition 5:** Prior to construction, the site certificate holder
35 shall finalize, and submit to the department for its approval, a final Vegetation
36 Management Plan. The protective measures described in the draft Vegetation
37 Management Plan in ASC Exhibit P1, Attachment P1-4, shall be included as part
38 of the final Vegetation Management Plan, unless otherwise approved by the
39 department.

40 **During Construction**

41 **Soil Protection Condition 4:** During construction, the site certificate holder shall
42 conduct all work in compliance with the construction-related final SPCC Plan
43 referenced in Soil Protection Condition 1.

1 **Soil Protection Condition 5:** During construction, the site certificate holder shall
2 conduct all work in compliance with the final Blasting Plan referenced in Soil
3 Protection Condition 2.

4 **Soil Protection Condition 6:** During construction, the site certificate holder shall
5 conduct all work in compliance with the final ESCP referenced in Soil Protection
6 Condition 3.

7 **Fish and Wildlife Condition 17:** During construction, the site certificate holder
8 shall conduct all work in compliance with the final Reclamation and Revegetation
9 Plan referenced in Fish and Wildlife Condition 4.

10 **Fish and Wildlife Condition 18:** During construction, the site certificate holder
11 shall conduct all work in compliance with the final Vegetation Management Plan
12 referenced in Fish and Wildlife Condition 5.

13 **Prior to Operation**

14 **Soil Protection Condition 7:** Prior to operation, if the site certificate holder is
15 required by ODEQ statutes or rules to implement a SPCC Plan for operation of
16 the facility, the site certificate holder shall submit to the department a copy of an
17 ODEQ-approved operation-related SPCC Plan.

18 **During Operation**

19 **Soil Protection Condition 8:** During operation, the site certificate holder shall
20 conduct all work in compliance with the operation-related SPCC Plan referenced
21 in Soil Protection Condition 7, if applicable.

22 **Soil Protection Condition 9:** During operation, the site certificate holder shall
23 inspect the Project features for soil impacts as part of the site certificate holder's
24 regular transmission line inspection process and shall implement corrective
25 actions and mitigation measures, if necessary.

26 **Fish and Wildlife Condition 28:** During operation, the site certificate holder
27 shall conduct all work in compliance with the final Vegetation Management Plan
28 referenced in Fish and Wildlife Condition 5.

29 **5.0 CONCLUSION**

30 Exhibit I includes the soils information required by OAR 345-021-0010(1)(i) and the Amended
31 Project Order, and demonstrates that the design, construction, and operation of the Project,
32 taking into account mitigation, are not likely to result in a significant adverse impact to soils.

33 **6.0 COMPLIANCE CROSS-REFERENCES**

34 Table I-12 identifies the location within the application for site certificate of the information
35 responsive to the application submittal requirements in OAR 345-021-0010(1)(i), the Soil
36 Protection Standard at OAR 345-022-0022, and the relevant Amended Project Order provisions.

1 **Table I-12. Compliance Requirements and Relevant Cross-References**

Requirement	Location
OAR 345-021-0010(1)(i)	
(i) Exhibit I. Information from reasonably available sources regarding soil conditions and uses in the analysis area, providing evidence to support findings by the Council as required by OAR 345-022-0022, including:	
(A) Identification and description of the major soil types in the analysis area.	Exhibit I, Section 3.3
(B) Identification and description of current land uses in the analysis area, such as growing crops, that require or depend on productive soils.	Exhibit I, Section 3.4
(C) Identification and assessment of significant potential adverse impact to soils from construction, operation and retirement of the facility, including, but not limited to, erosion and chemical factors such as salt deposition from cooling towers, land application of liquid effluent, and chemical spills.	Exhibit I, Section 3.5
(D) A description of any measures the applicant proposes to avoid or mitigate adverse impact to soils.	Exhibit I, Section 3.6
(E) The applicant's proposed monitoring program, if any, for adverse impact to soils during construction and operation.	Exhibit I, Section 3.7
OAR 345-022-0022	
To issue a site certificate, the Council must find that the design, construction and operation of the facility, taking into account mitigation, are not likely to result in a significant adverse impact to soils including, but not limited to, erosion and chemical factors such as salt deposition from cooling towers, land application of liquid effluent, and chemical spills.	Exhibit I, Section 3.6
Amended Project Order Comments	
The applicant shall include information describing the impact of construction and operation of the proposed facility on soil conditions in the analysis area. Describe all measures proposed to maintain soil productivity during construction and operation. The applicant should consult with local farmers, landowners, soil conservation districts, and federal land managers regarding mitigation of impacts to farm and forest lands. Specific discussion should include weed encroachment, interference with irrigation equipment, and the potential for restrictions to aerial applications caused by the proximity of transmission towers.	Exhibit I, Section 3.2.1 through Section 3.2.4, Section 3.5, and Section 3.6
Exhibit I should also include the required evidence related to the federally-delegated National Pollutant Discharge Elimination System (NPDES) 1200-C permit application (alternatively, the NPDES information could be incorporated into Exhibit BB – Other Information). OAR 345-021-0000(7) requires the applicant to submit one copy of all applications for federally-delegated permits, or provide a schedule of the date by which the applicant intends to submit the application. In addition to a copy of the federally delegated permit application, the applicant must also provide a letter or other indication from the ODEQ stating that the agency has received a permit application from the applicant, identifying any additional information the agency is likely to need from the applicant based on the agency's review of the application, and estimating the date when the agency will complete its review and issue a permit decision.	Exhibit I, Section 3.6.2, Attachment I-3
The applicant should emphasize discussion of erosion control in Exhibit I, especially for impacted forestland to minimize and mitigate damage to forest soils and streams. A draft erosion and sediment control plan must be	Exhibit I, Section 3.4, Section 3.5.1.4,

Requirement	Location
provided for review (if not already incorporated into an attached NPDES permit application), if the applicant will rely upon the erosion and sediment control plan to meet the soil protection standard.	Section 3.6.2, Section 3.6.4, Section 3.6.8, and Attachment I-3

1 7.0 RESPONSE TO PUBLIC COMMENTS

2 Table I-13 provides IPC's responses to the public comments cited in the Amended Project
3 Order.

4 Table I-13. Public Comments

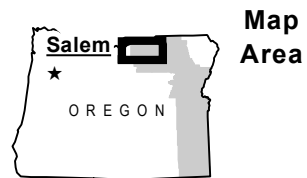
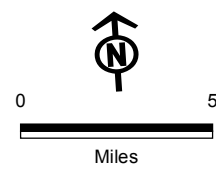
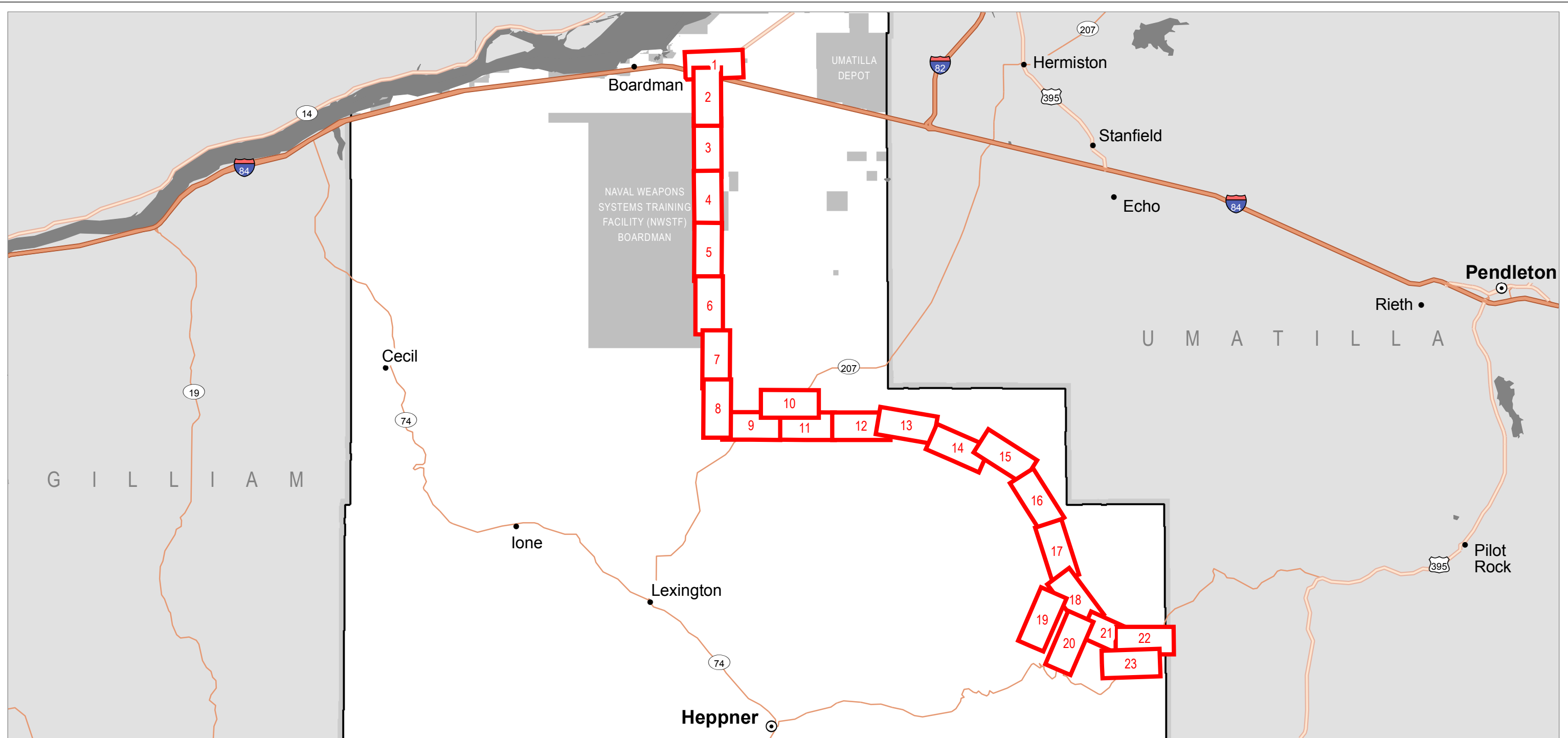
Public Comments	Location
Road construction and facility operation impacts that have the potential to affect soils shall be addressed in Exhibit I. Exhibit I shall address impacts of road construction and long term facility operation, including sedimentation and runoff to water bodies; soil compaction; potential impacts to farming operations or to fish; revegetation of disturbed sites; and weed control.	See Exhibit I, Section 3.5.2.1, Section 3.5.2.3, Section 3.6.1, Section 3.6.2, Section 3.6.4, and Section 3.6.8
A commenter expressed a desire to limit use of roads during wet weather. Exhibit I shall address whether the applicant proposes to limit the use of a road (or roads) during construction and operations during wet weather conditions.	Exhibit I, Section 3.6.4
A commenter expressed concern that there will adverse impacts on the soil conservation activities being conducted in upper Kitchen Creek Valley (Baker County) and its drainages. Exhibit I shall address potential impacts to active soil conservation projects in the area, and proposed mitigation measures as necessary.	No Project features are located in the Kitchen Creek Valley.

5 8.0 REFERENCES

- 6 BLM (Bureau of Land Management). 1989. Baker Resource Management Plan Record of
7 Decision. Rangeland Program Summary. BLM-OR-PT-89-10-1792. Available online at:
8 http://www.blm.gov/or/plans/files/Baker_RMP.pdf
- 9 BLM. 2002. Southeastern Oregon Resource Management Plan and Record of Decision. Vale
10 Field Office. September. Available online at:
11 <http://www.blm.gov/or/districts/vale/plans/seormp.php>
- 12 DOE (Department of Energy, Pacific Northwest National Laboratory). 2003. 5.3.2 Soil Erodibility
13 Factor. Available online at:
14 http://mepas.pnl.gov/mepas/formulations/source_term/5_0/5_32/5_32.html (accessed
15 April 2011).
- 16 NRCS (Natural Resources Conservation Service). 2011. U.S. General Soil Map (STATSGO2).
17 Available online at <http://soildatamart.nrcs.usda.gov> (Accessed 11/2011).
- 18 ODEQ (Oregon Department of Environmental Quality). 2005. Erosion and Sediment Control
19 Manual. Available online at: <http://www.cicacenter.org/pdf/ORESCManual.pdf>

- 1 Oregon Spatial Data Library. 2013. Available at:
- 2 <http://oregonexplorer.info/wetlands/DataCollections/GeospatialData>. Accessed 2013.
- 3 Soil Survey Division Staff. 1993. Soil Survey Manual. Soil Conservation Service. U.S.
- 4 Department of Agriculture Handbook 18. Available online at:
- 5 <http://soils.usda.gov/technical/manual/>
- 6 USFS (United States Forest Service). 1990. Land and Resource Management Plan. Wallowa-
- 7 Whitman National Forest. Pacific Northwest Region. Available online at:
- 8 <http://www.fs.usda.gov/detail/wallowa-whitman/landmanagement/planning/?cid=stelprdb5259879>
- 9 USFS. 1991. FSH 2509.18 – Soil Management Handbook. Effective September 3. Available
- 10 online at http://www.fs.fed.us/im/directives/fsh/2509.18/2509.18,0_code.txt

ATTACHMENT I-1
MAPBOOK OF SOIL MAPPING UNITS



Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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June 2017

Map Index

Location Map (Map #)

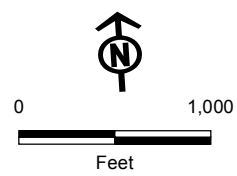


Boardman to Hemingway
Transmission Line Project

**Attachment I-1
Soil Mapping Units
Location Maps**

Morrow County

Map Index



Project Features

- Site Boundary
- Proposed Route
- Stations

Mileposts

- Mile
- Tenth-mile

STATSGO Soil Factors

- Quincy

Land Status

- Bureau of Land Management
- Bureau of Reclamation
- Private



Boardman to Hemingway
Transmission Line Project

**Attachment I-1
Soil Mapping Units**

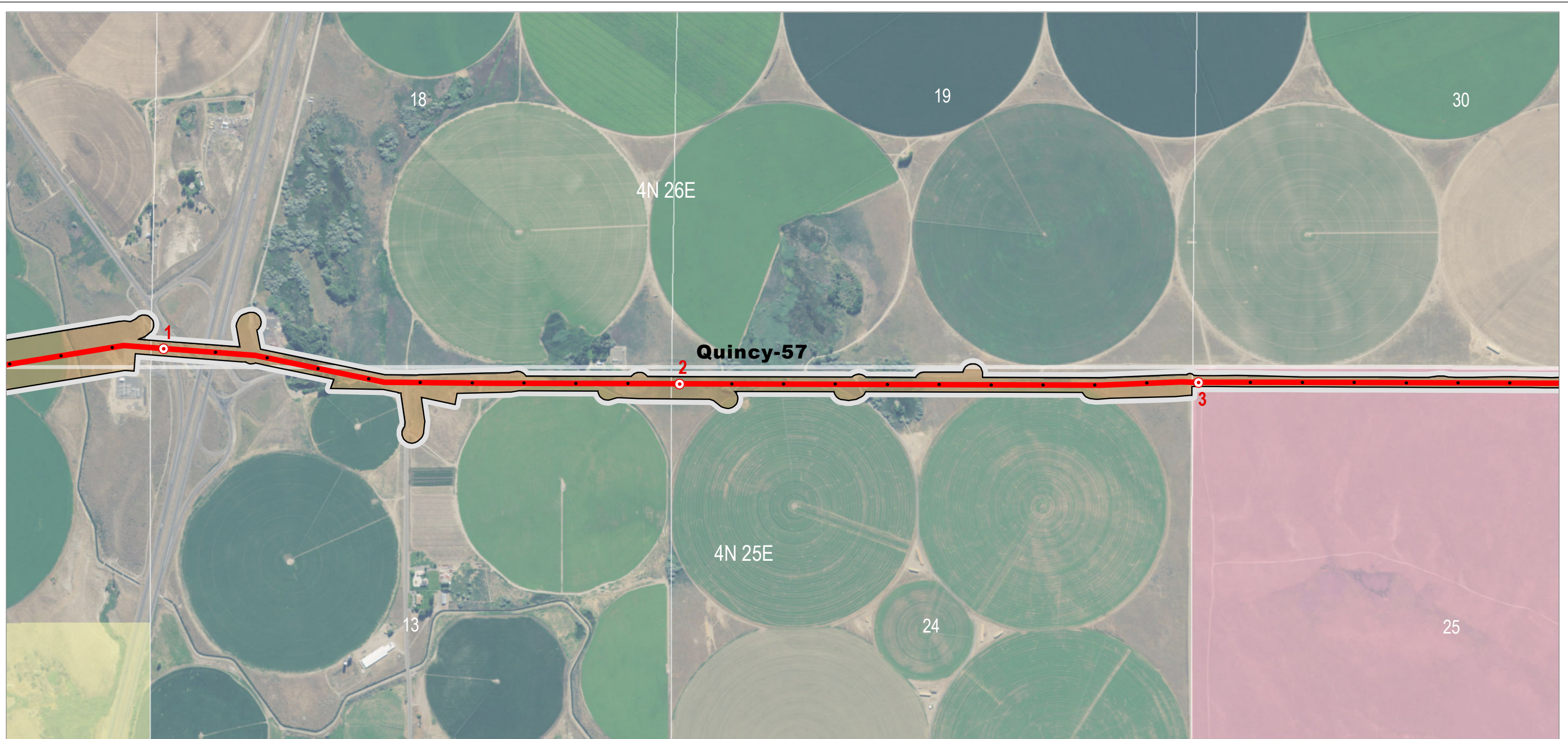
Proposed Route
Morrow County

Map 1

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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June 2017



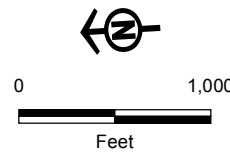
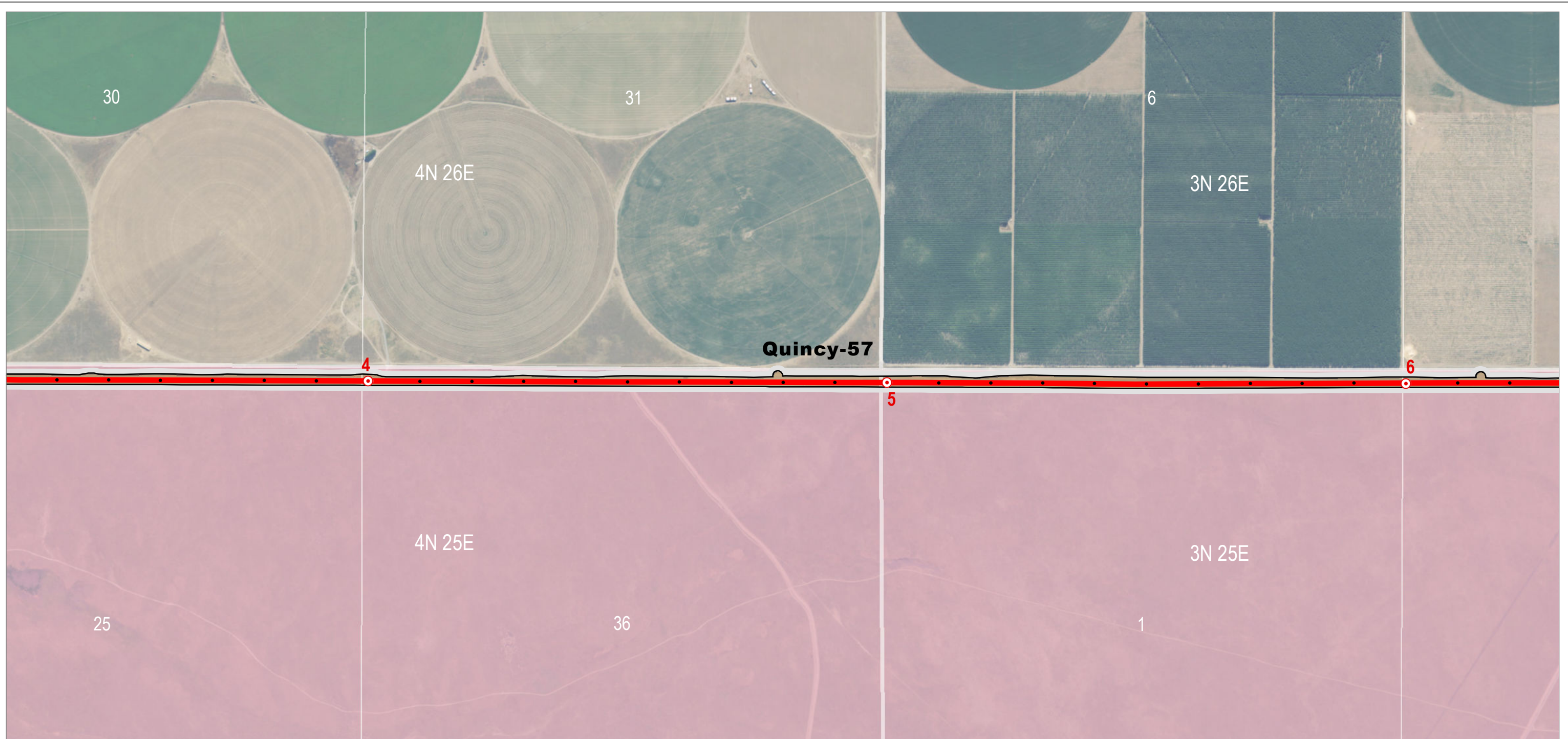
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|---|---|--|

**Attachment I-1
Soil Mapping Units**

Proposed Route
Morrow County

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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Project Features

- Site Boundary
- Proposed Route
- Mileposts**
- Mile
- Tenth-mile

STATSGO Soil Factors

- Quincy

Land Status

- Military Reservation or Corps of Engineers
- Private



Boardman to Hemingway
Transmission Line Project

**Attachment I-1
Soil Mapping Units**

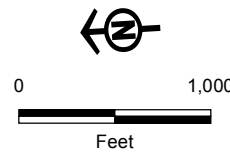
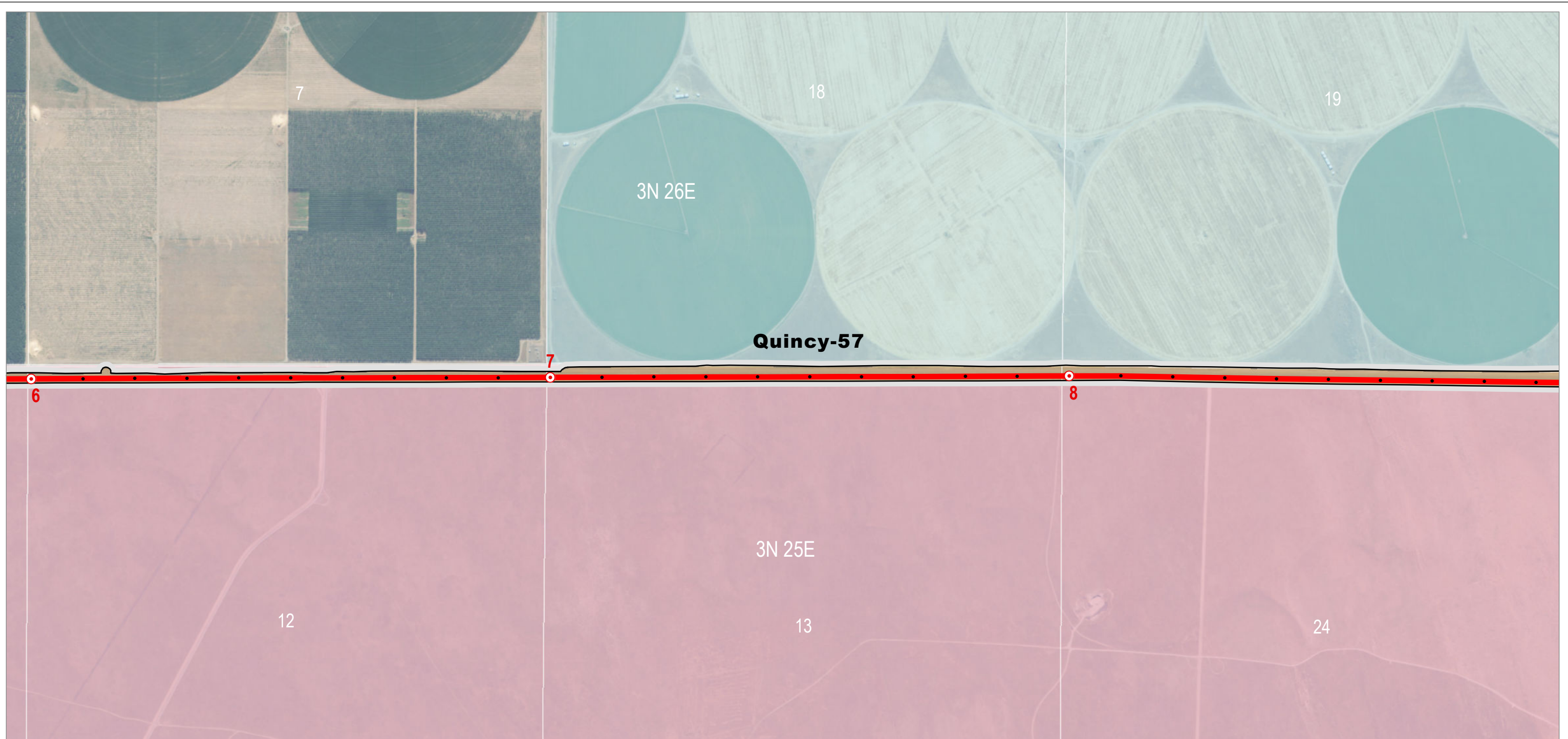
Proposed Route
Morrow County

Map 3

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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June 2017



Project Features

- Site Boundary
- Proposed Route
- Mileposts**
- Mile
- Tenth-mile

STATSGO Soil Factors

- Quincy

Land Status

- Military Reservation or Corps of Engineers
- Private
- State or Local



Boardman to Hemingway
Transmission Line Project

**Attachment I-1
Soil Mapping Units**

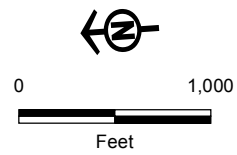
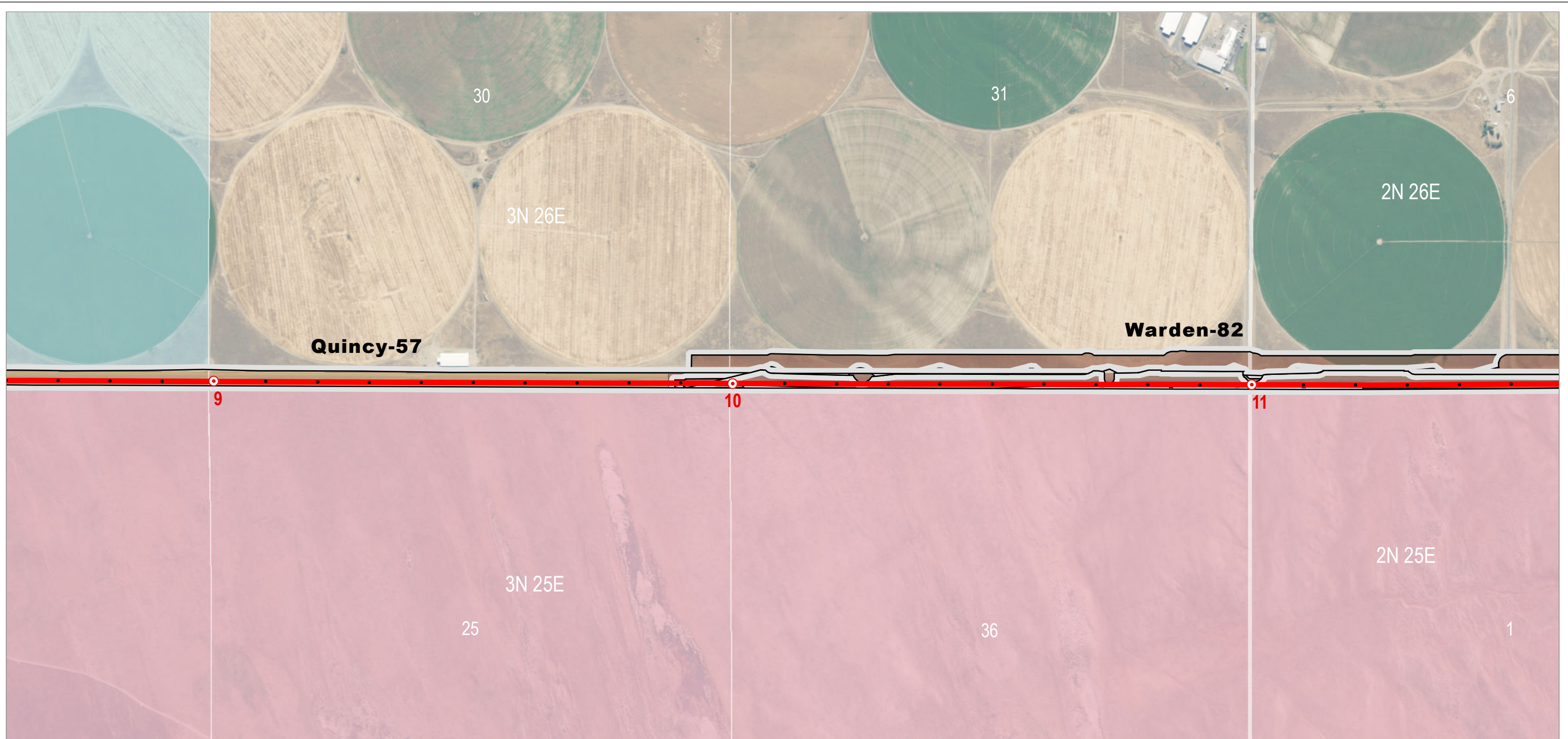
Proposed Route
Morrow County

Map 4

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June 2017



Project Features

- Site Boundary
- Proposed Route
- Mileposts**
- Mile
- Tenth-mile

STATSGO Soil Factors

- Quincy
- Warden

Land Status

- Military Reservation or Corps of Engineers
- Private
- State or Local



Boardman to Hemingway
Transmission Line Project

**Attachment I-1
Soil Mapping Units**

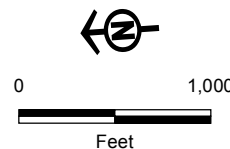
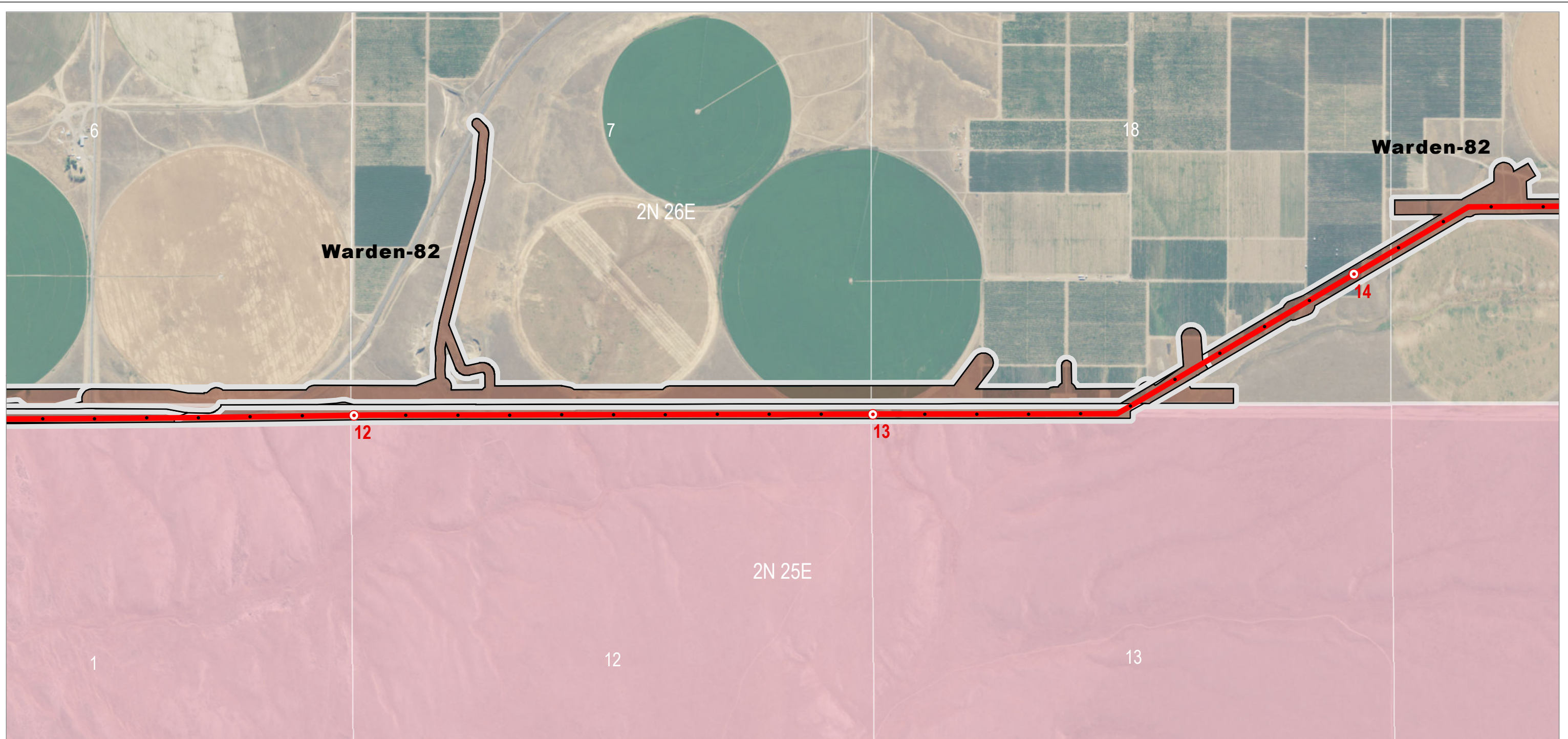
Proposed Route
Morrow County

Map 5

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June 2017



Project Features

- Site Boundary
- Proposed Route
- Mileposts**
- Mile
- Tenth-mile

STATSGO Soil Factors

- Warden

Land Status

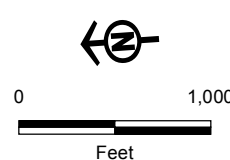
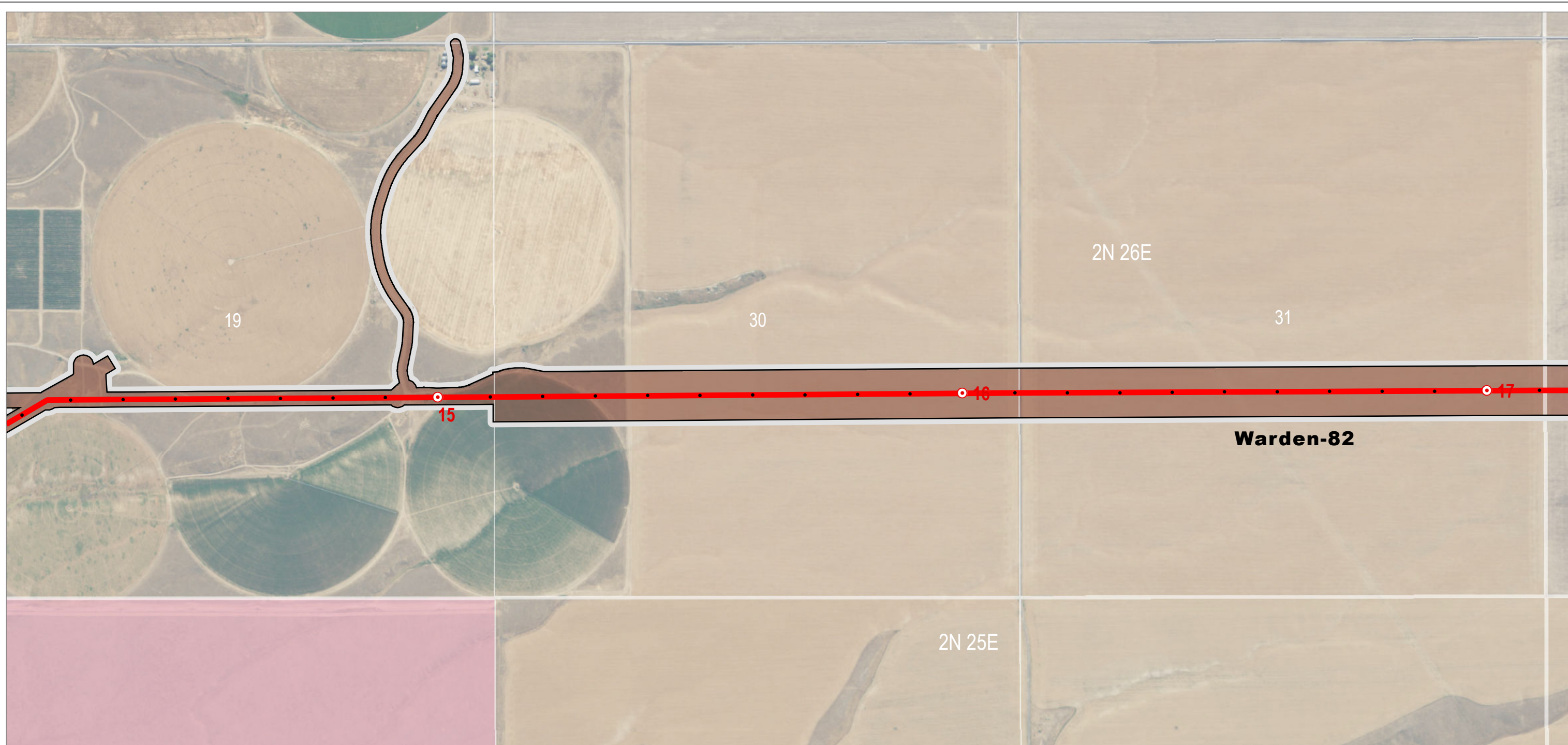
- Military Reservation or Corps of Engineers
- Private

**Attachment I-1
Soil Mapping Units**

Proposed Route
Morrow County

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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- Project Features**
- Site Boundary
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- Mileposts**
- Mile
 - Tenth-mile

- STATSGO Soil Factors**
- Warden

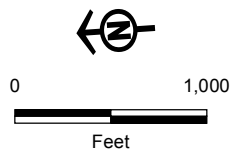
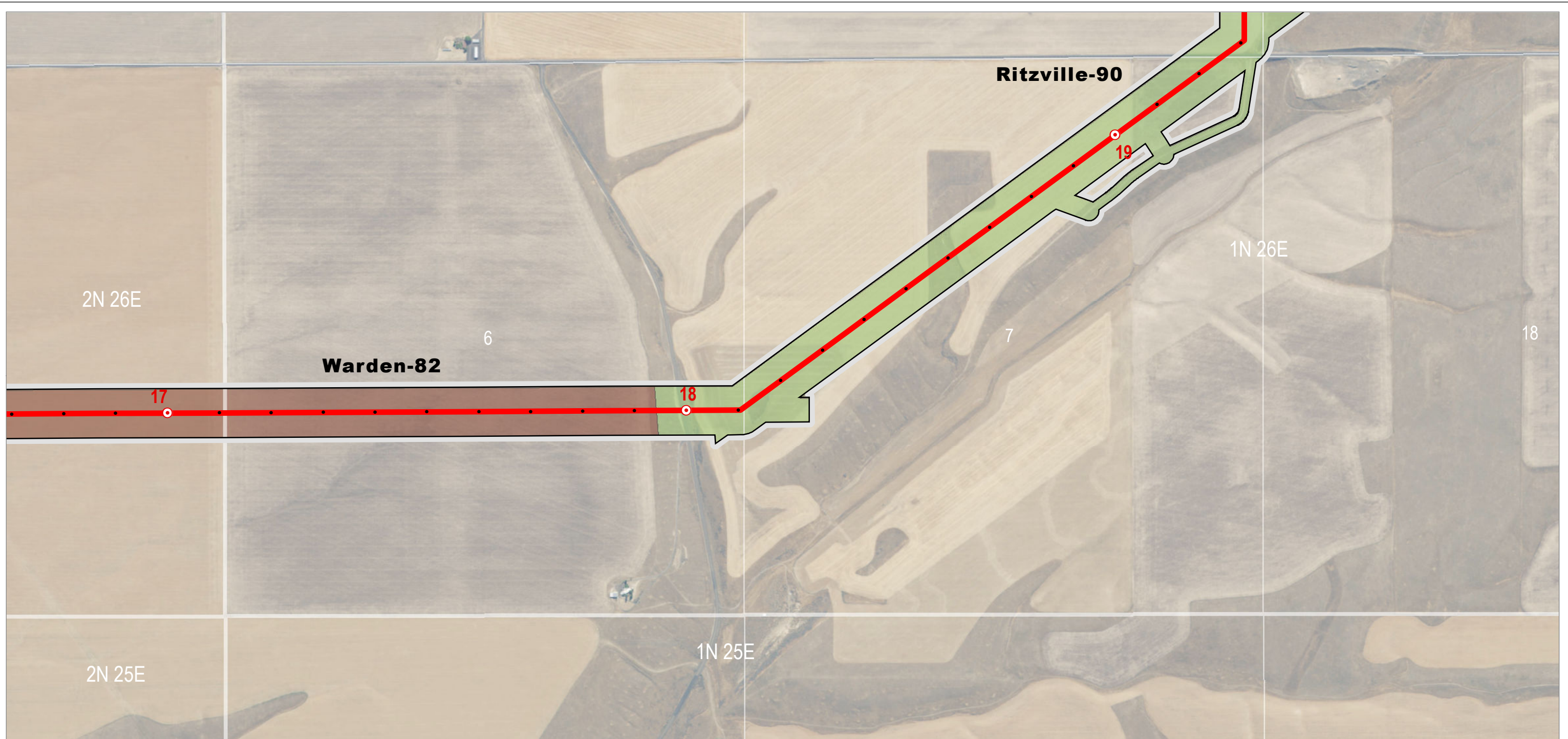
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**Attachment I-1
Soil Mapping Units**

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Project Features

- Site Boundary
- Proposed Route

Mileposts

- Mile
- Tenth-mile

STATSGO Soil Factors

- Ritzville
- Warden

Land Status

- Private



Boardman to Hemingway
Transmission Line Project

**Attachment I-1
Soil Mapping Units**

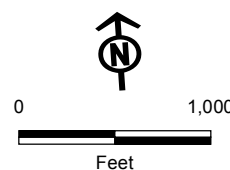
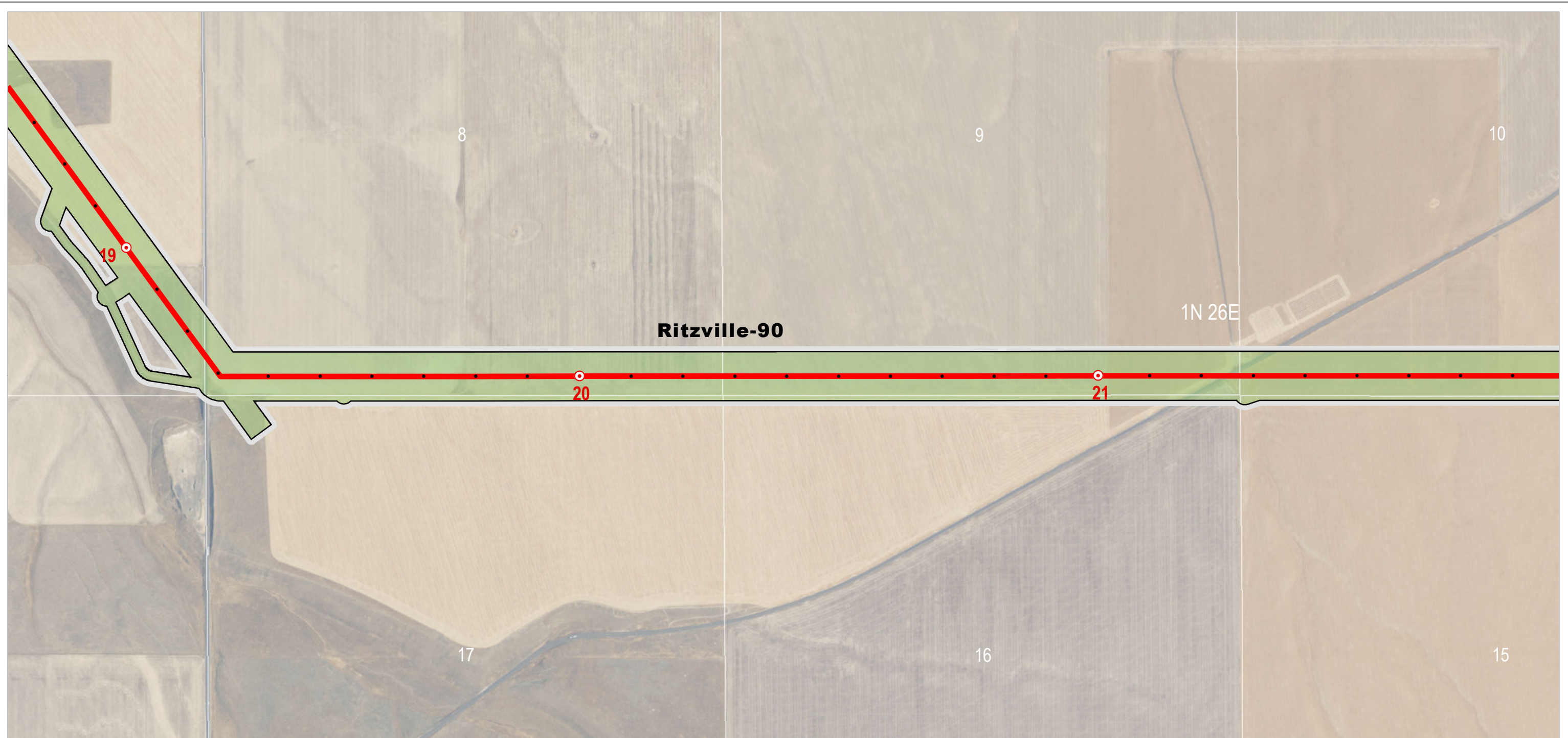
Proposed Route
Morrow County

Map 8

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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June 2017



- Project Features**
- Site Boundary
 - Proposed Route
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- Mile
 - Tenth-mile

- STATSGO Soil Factors**
- Ritzville

- Land Status**
- Private

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AN IDACORP COMPANY

Boardman to Hemingway
Transmission Line Project

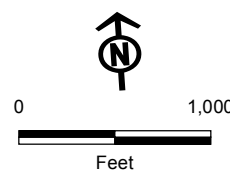
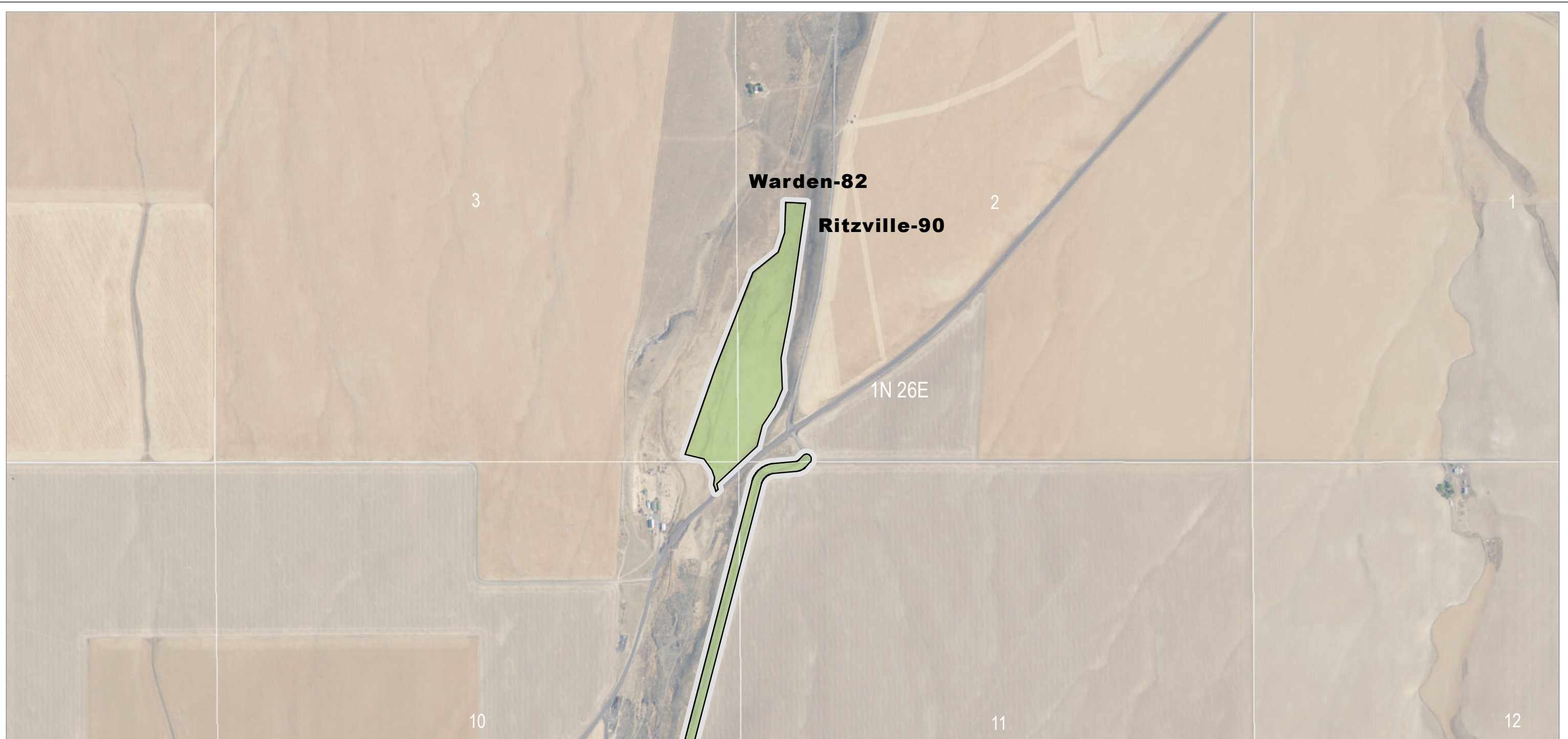
**Attachment I-1
Soil Mapping Units**

Proposed Route
Morrow County

Map 9

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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Project Features
 Site Boundary

STATSGO Soil Factors
 Ritzville
 Warden

Land Status
 Private

IDAHO POWER
 AN IDACORP COMPANY
 Boardman to Hemingway
 Transmission Line Project

**Attachment I-1
 Soil Mapping Units**

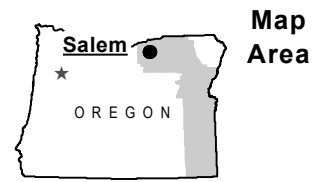
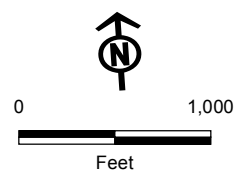
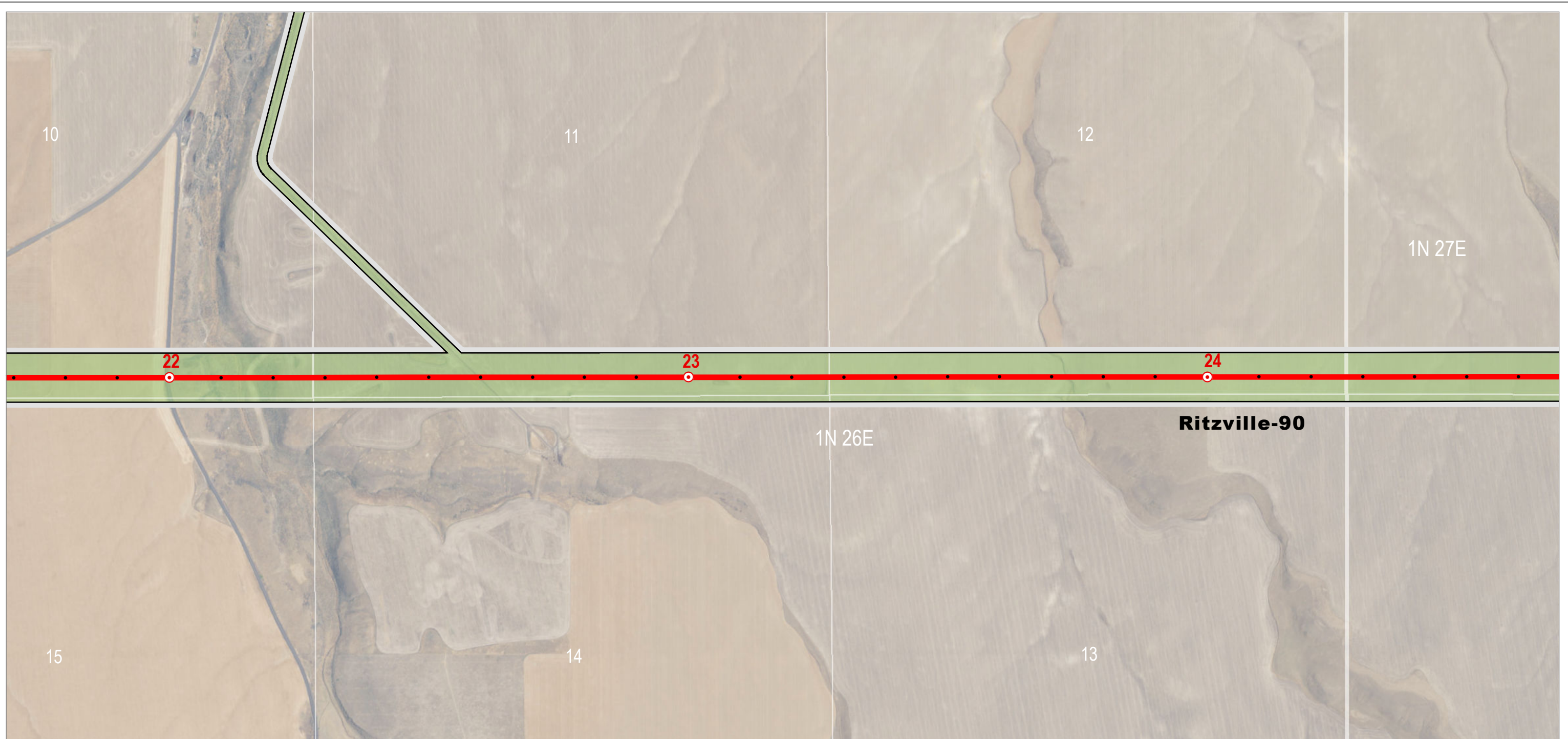
Proposed Route
 Morrow County

Map 10

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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June 2017



Project Features

- Site Boundary
- Proposed Route

Mileposts

- Mile
- Tenth-mile

STATSGO Soil Factors

- Ritzville

Land Status

- Private



Boardman to Hemingway
Transmission Line Project

**Attachment I-1
Soil Mapping Units**

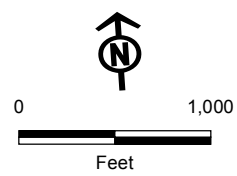
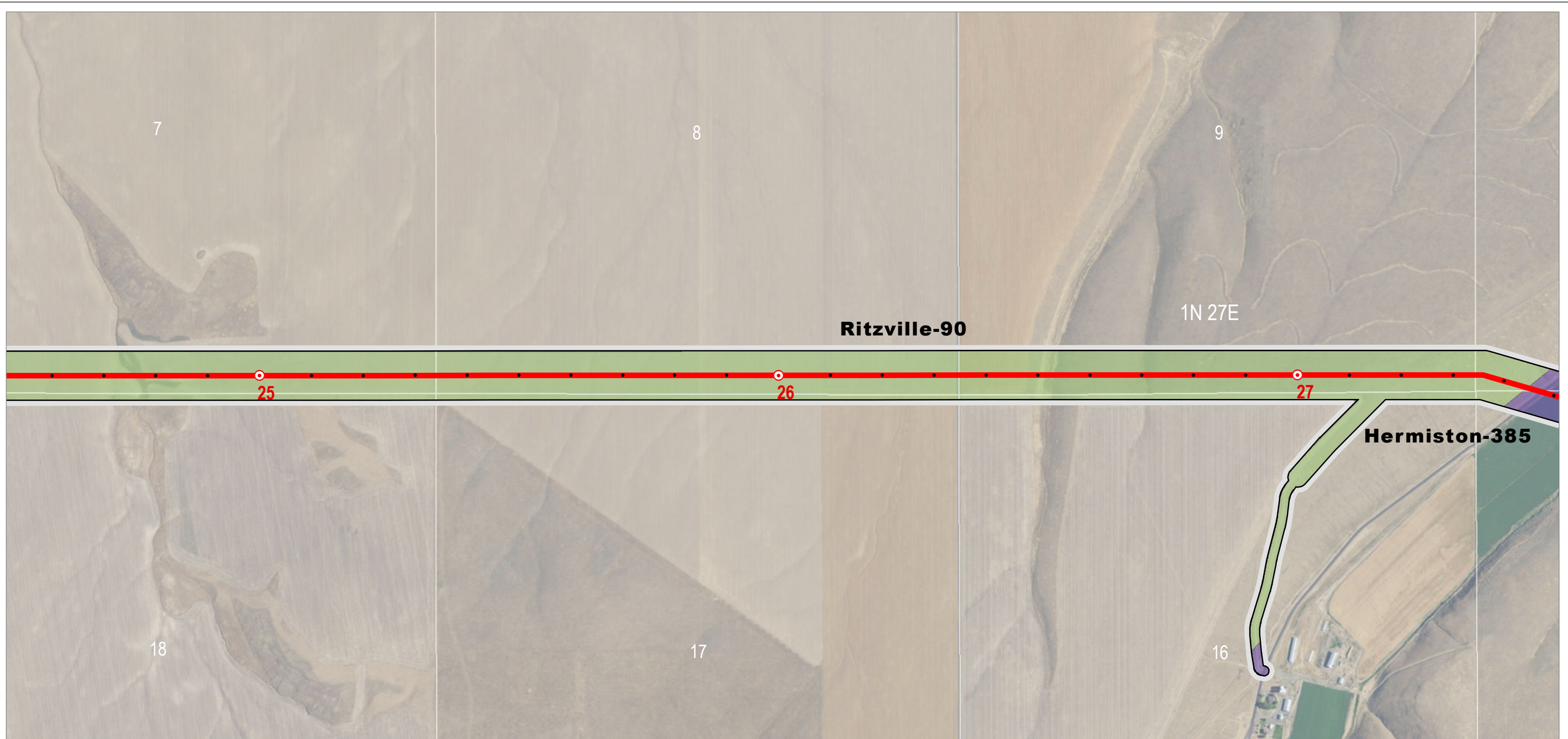
Proposed Route
Morrow County

Map 11

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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June 2017



Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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June 2017

Project Features

- Site Boundary
- Proposed Route

Mileposts

- Mile
- Tenth-mile

STATSGO Soil Factors

- Hermiston
- Ritzville

Land Status

- Private

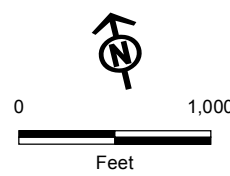
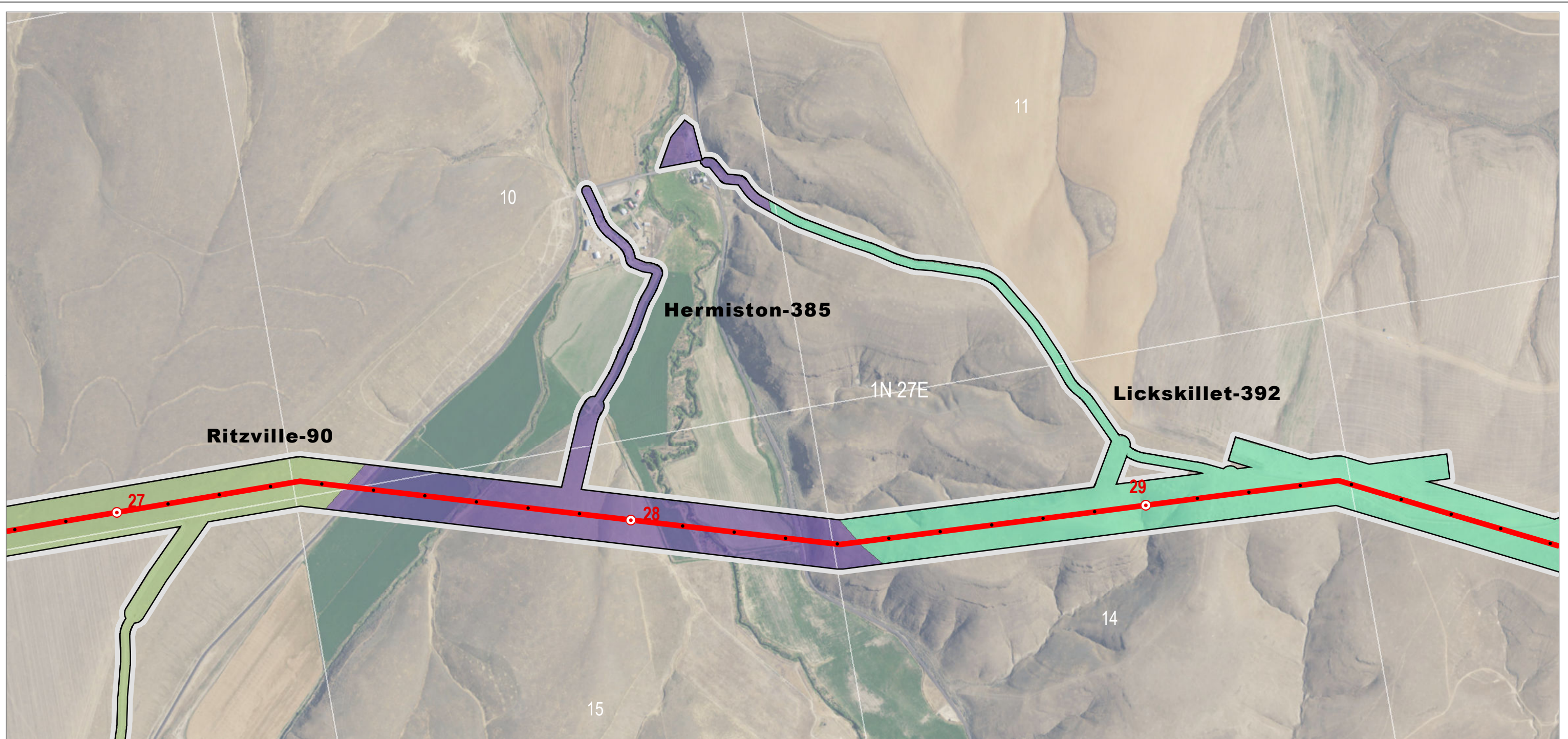


Boardman to Hemingway
Transmission Line Project

**Attachment I-1
Soil Mapping Units**

Proposed Route
Morrow County

Map 12



Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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June 2017

Project Features

- Site Boundary
- Proposed Route

Mileposts

- Mile
- Tenth-mile

STATSGO Soil Factors

- Hermiston
- Lickskillet
- Ritzville

Land Status

- Private

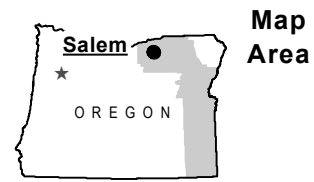
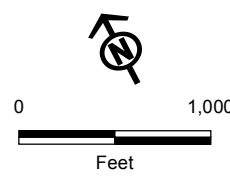
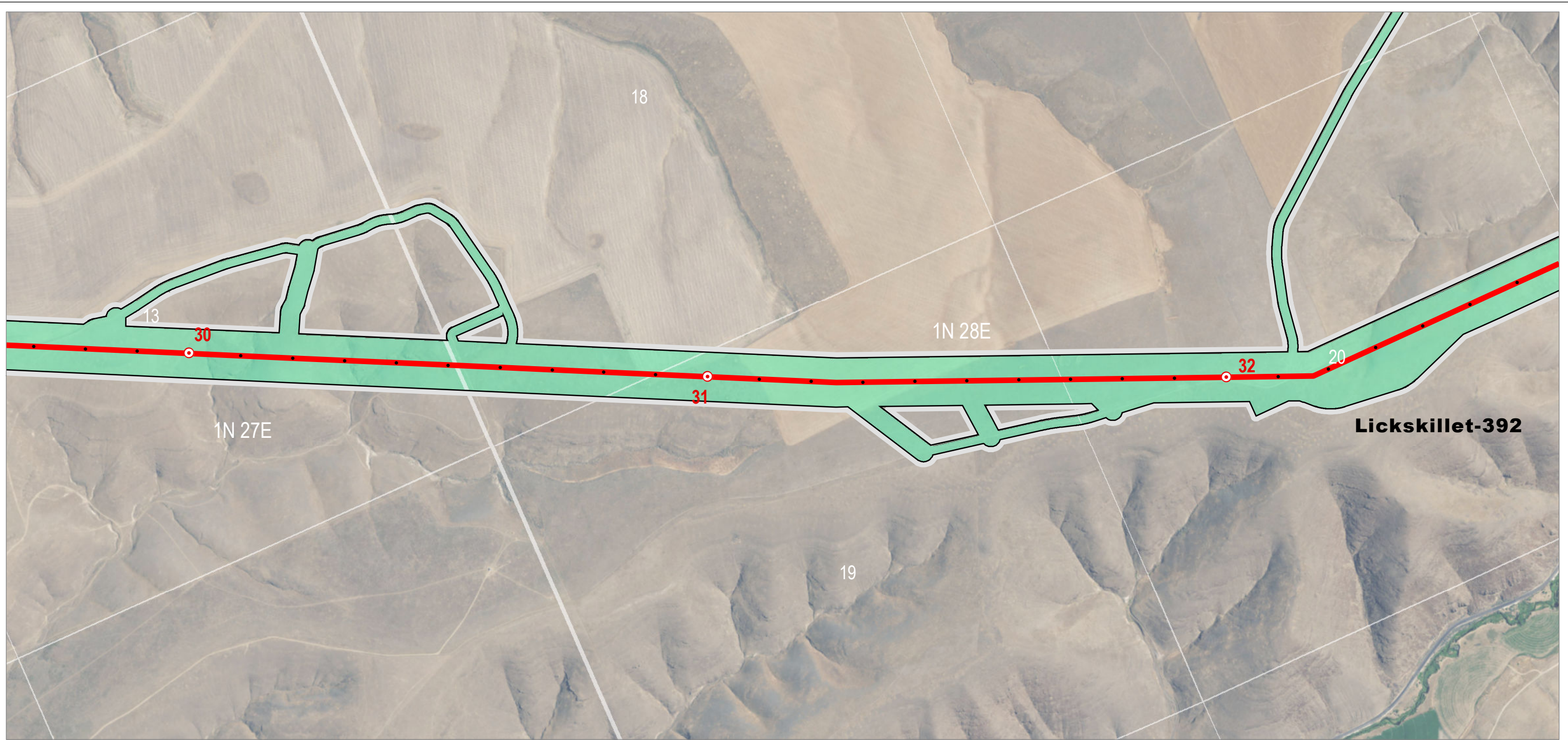


Boardman to Hemingway
Transmission Line Project

**Attachment I-1
Soil Mapping Units**

Proposed Route
Morrow County

Map 13



Project Features

- Site Boundary
- Proposed Route

Mileposts

- Mile
- Tenth-mile

STATSGO Soil Factors

- Lickskillet

Land Status

- Private



Boardman to Hemingway
Transmission Line Project

**Attachment I-1
Soil Mapping Units**

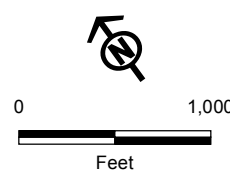
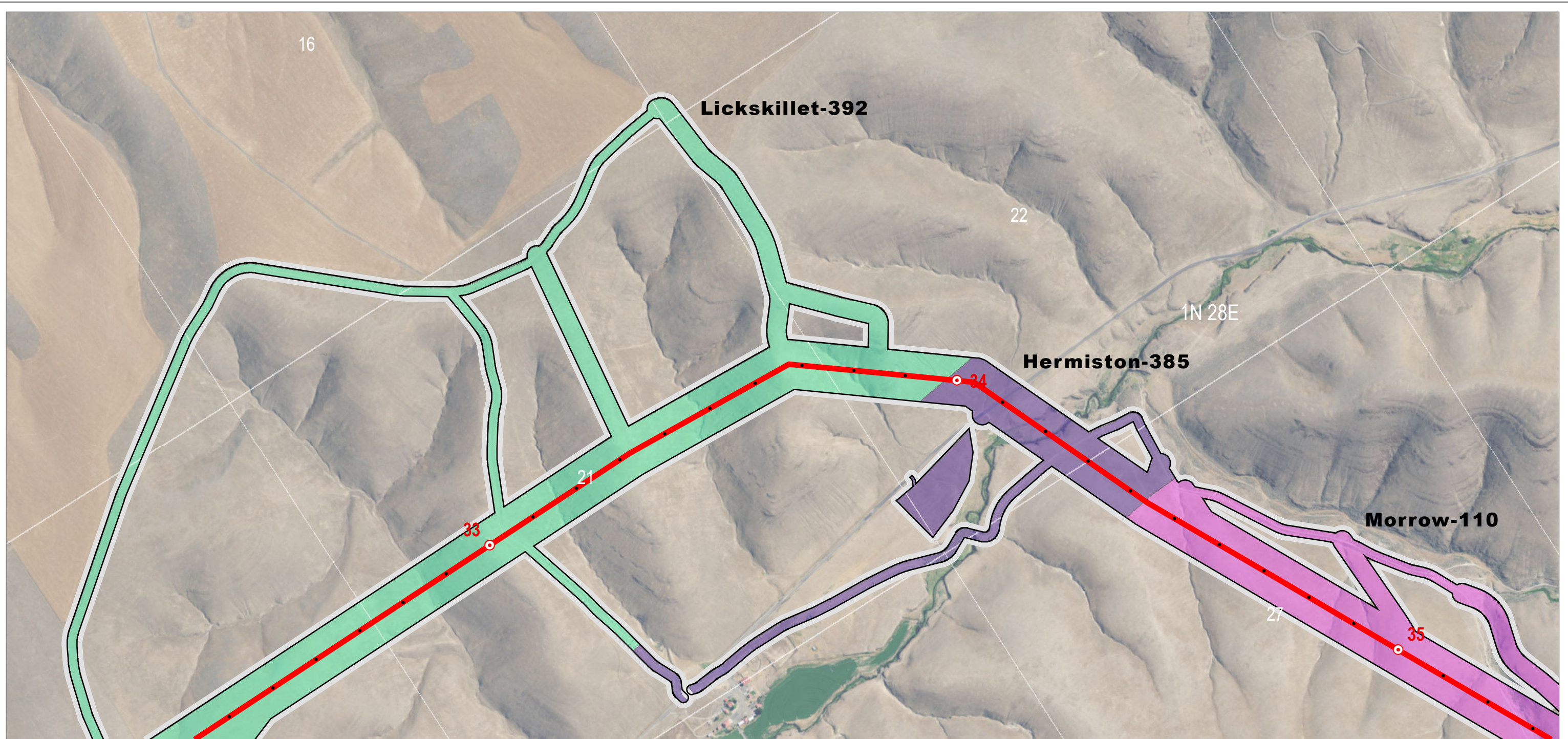
Proposed Route
Morrow County

Map 14

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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June 2017



- | Project Features | STATSGO Soil Factors | Land Status |
|------------------|----------------------|-------------|
| Site Boundary | Hermiston | Private |
| Proposed Route | Lickskillet | |
| Mileposts | Morrow | |
| Mile | | |
| Tenth-mile | | |

IDAHO POWER
An IDACORP Company

Boardman to Hemingway
Transmission Line Project

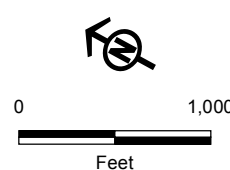
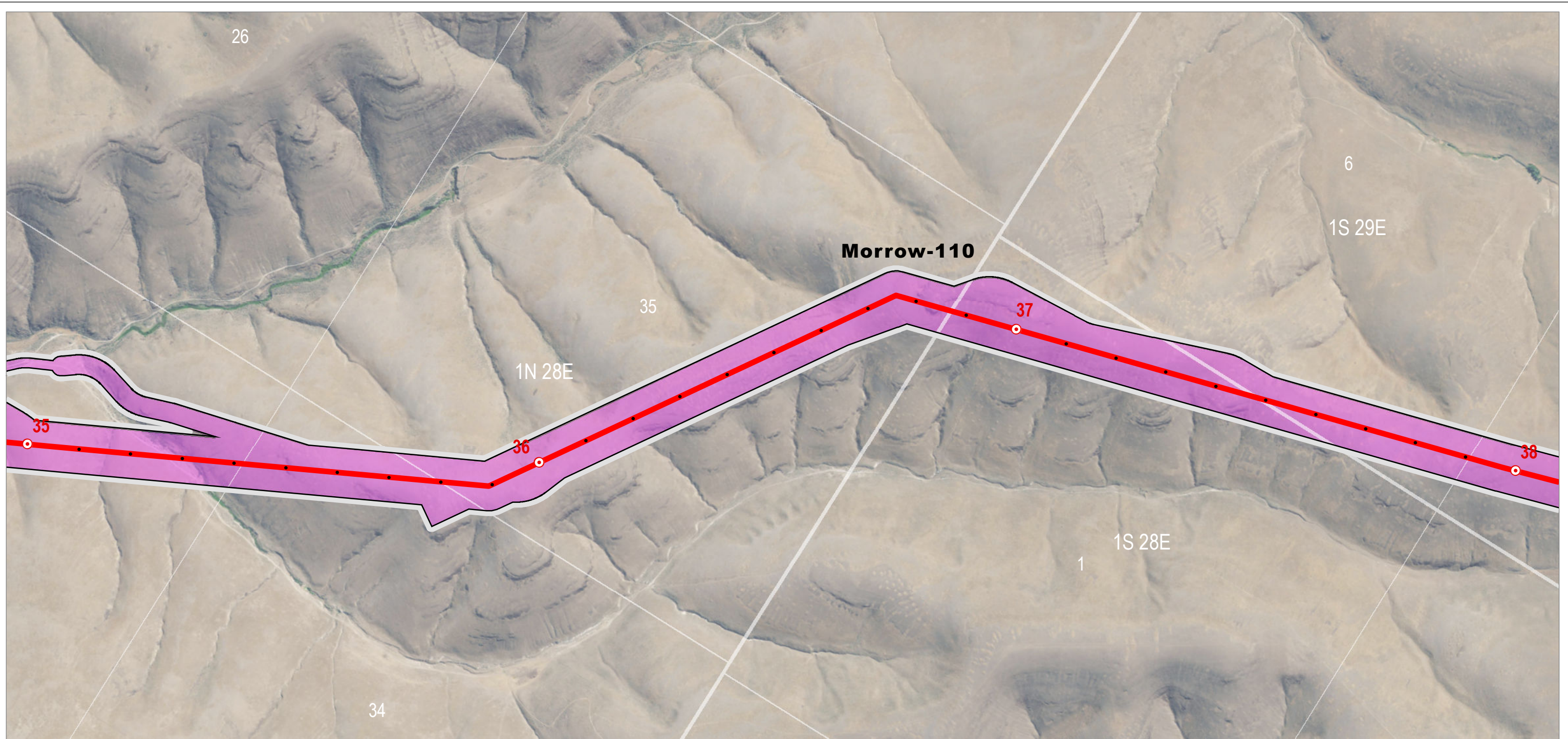
**Attachment I-1
Soil Mapping Units**

Proposed Route
Morrow County

Map 15

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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- Project Features**
- Site Boundary
 - Proposed Route
- Mileposts**
- Mile
 - Tenth-mile

- STATSGO Soil Factors**
- Morrow

- Land Status**
- Private

IDAHO POWER
An IDACORP Company

Boardman to Hemingway
Transmission Line Project

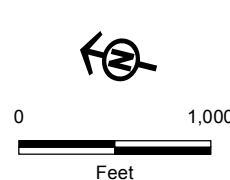
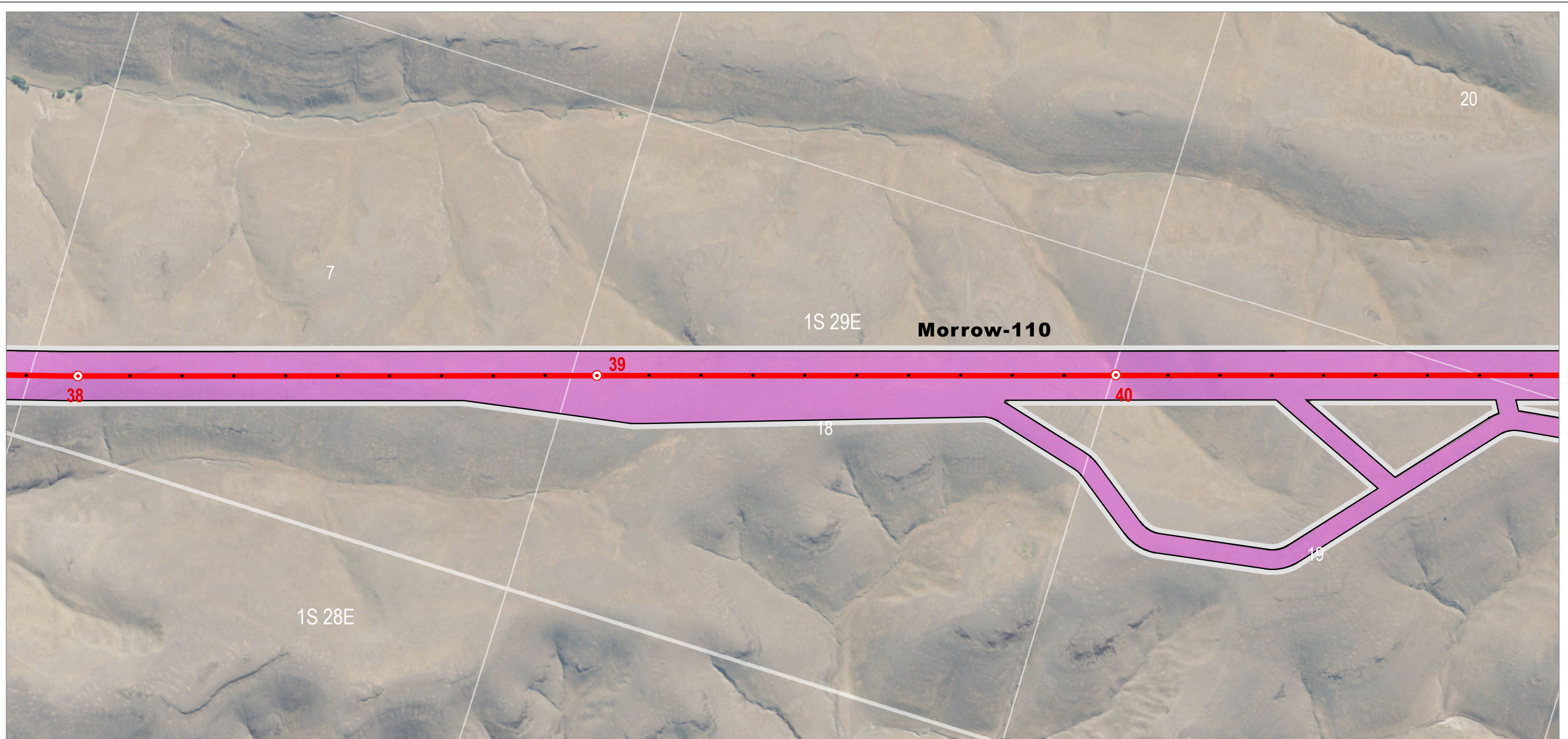
**Attachment I-1
Soil Mapping Units**

Proposed Route
Morrow County

Map 16

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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- Project Features**
- Site Boundary
 - Proposed Route
- Mileposts**
- Mile
 - Tenth-mile

- STATSGO Soil Factors**
- Morrow

- Land Status**
- Private

IDAHO POWER
An IDACORP Company

Boardman to Hemingway
Transmission Line Project

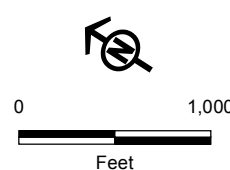
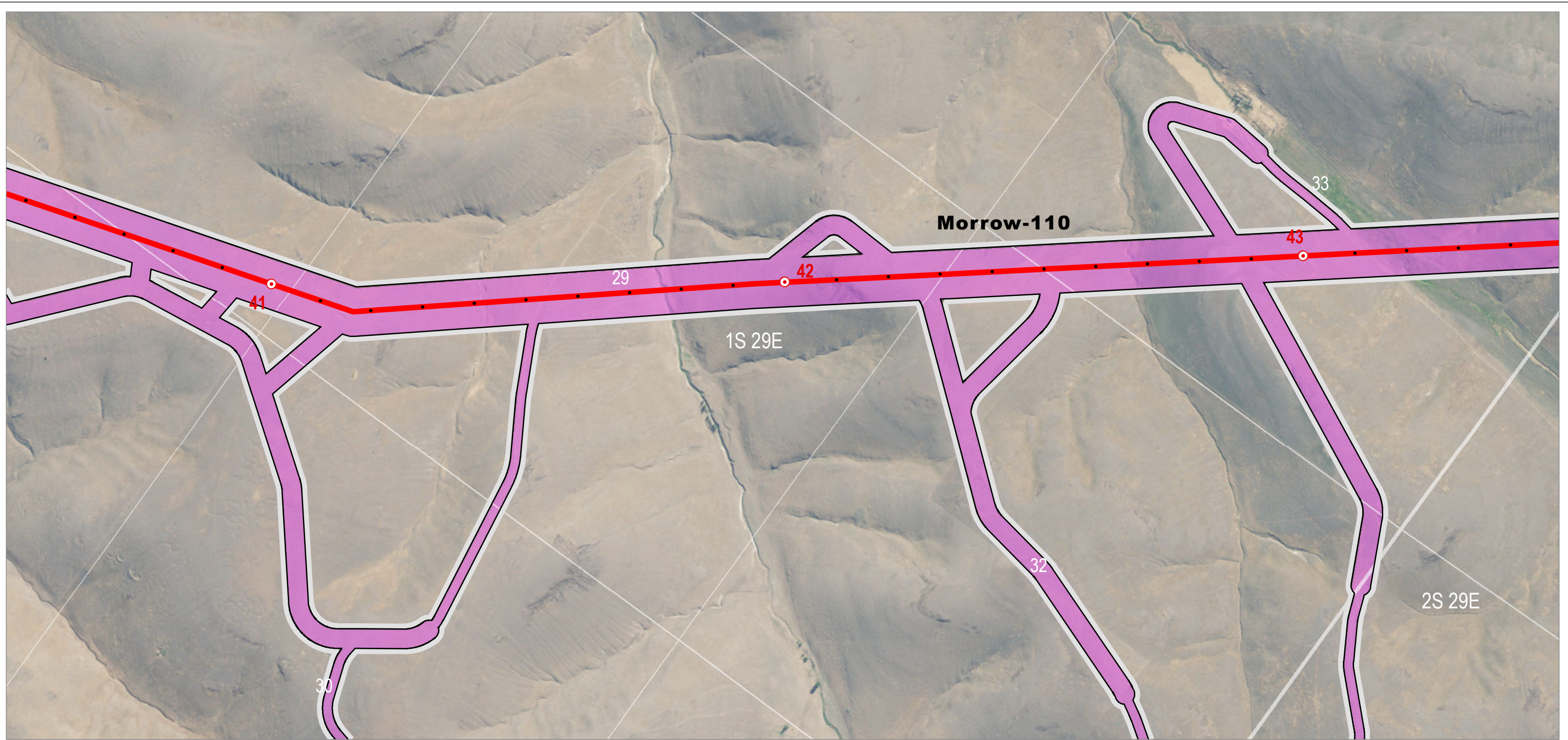
**Attachment I-1
Soil Mapping Units**

Proposed Route
Morrow County

Map 17

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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Project Features

- Site Boundary
- Proposed Route

Mileposts

- Mile
- Tenth-mile

STATSGO Soil Factors

- Morrow

Land Status

- Private



Boardman to Hemingway
Transmission Line Project

**Attachment I-1
Soil Mapping Units**

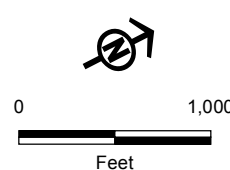
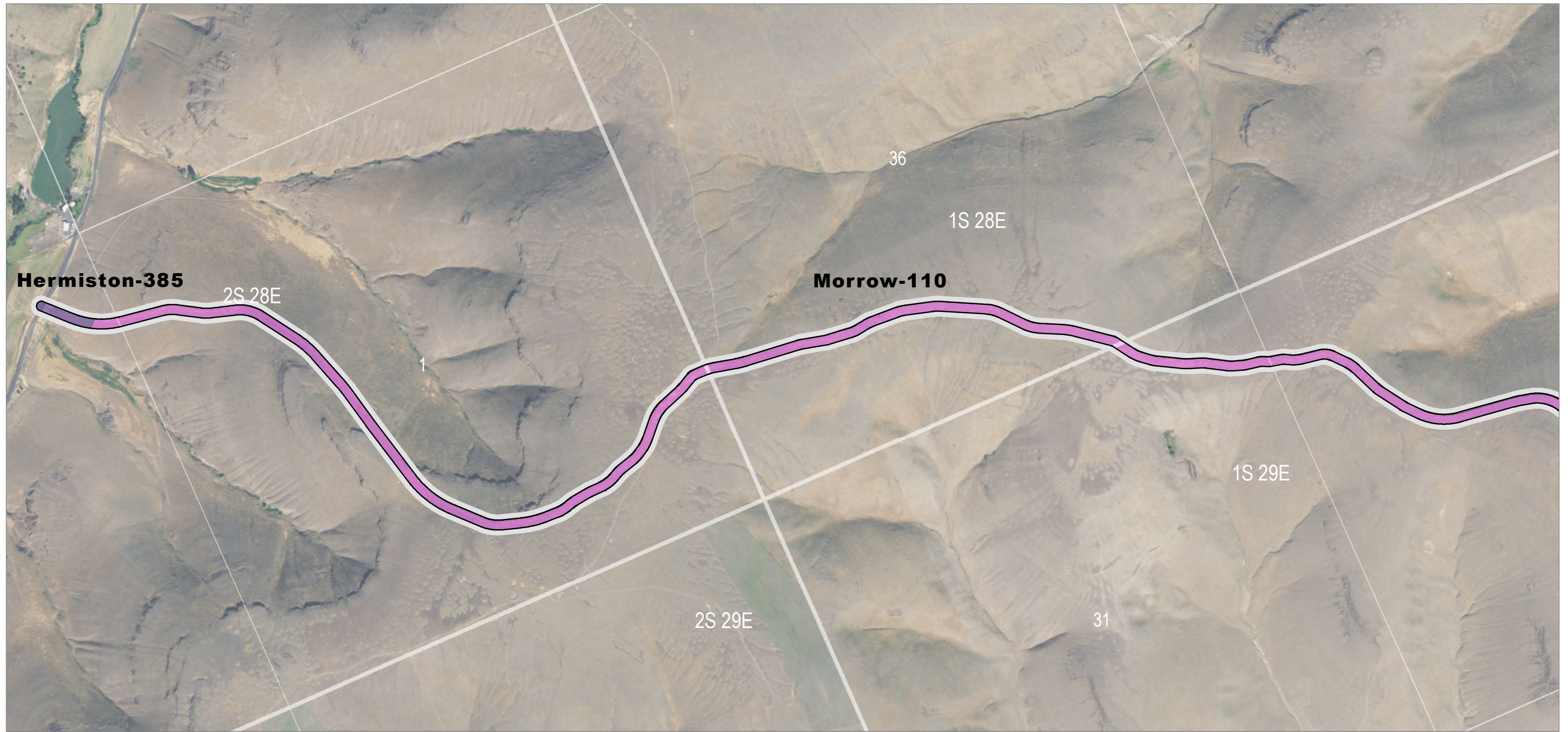
Proposed Route
Morrow County

Map 18

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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June 2017



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|-------------------------|-----------------------------|--------------------|
| Project Features | STATSGO Soil Factors | Land Status |
| Site Boundary | Hermiston | Private |
| | Morrow | |

IDAHO POWER
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Boardman to Hemingway
Transmission Line Project

**Attachment I-1
Soil Mapping Units**

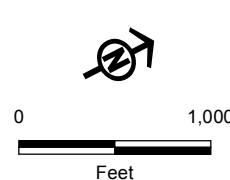
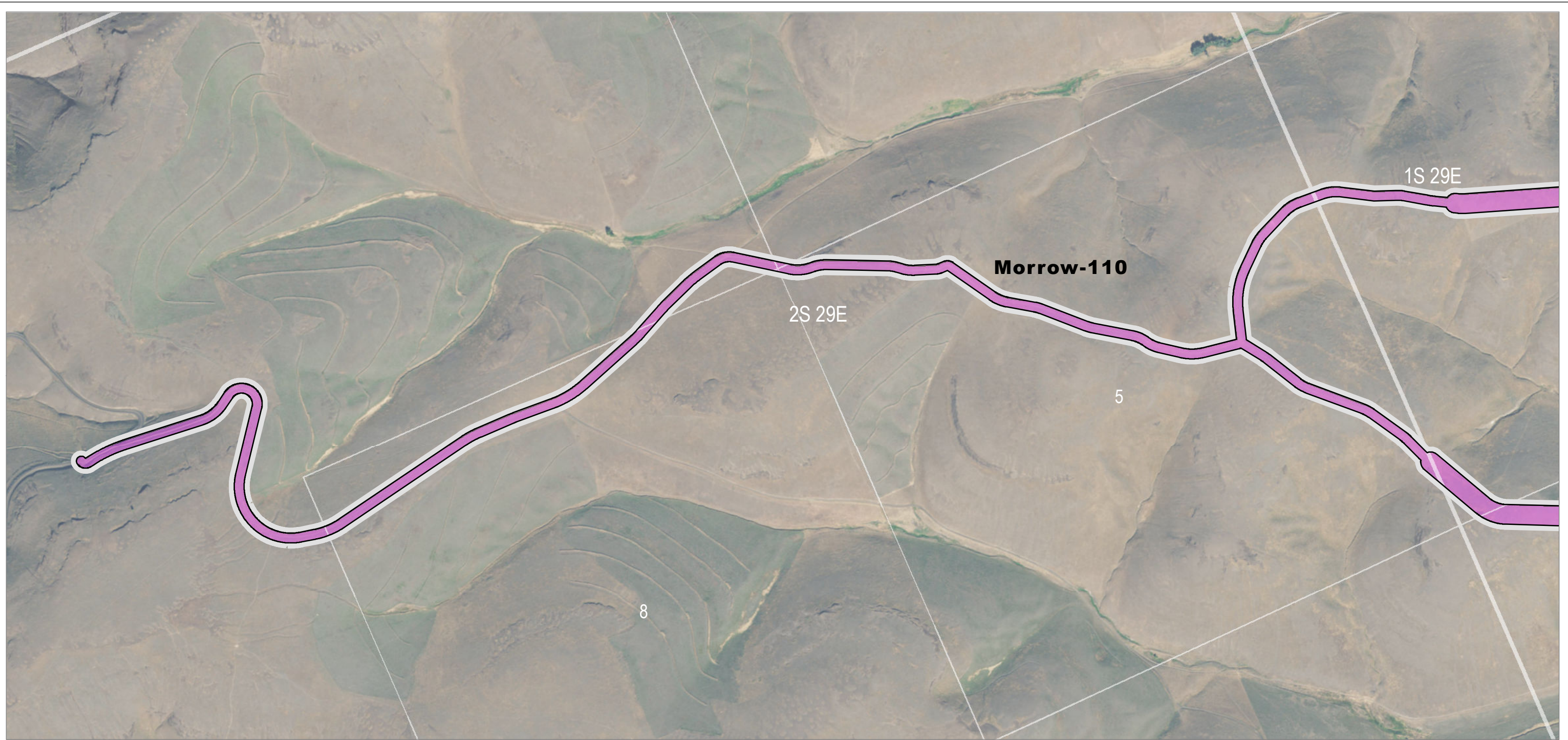
Proposed Route
Morrow County

Map 19

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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June 2017

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|-------------------------|-----------------------------|--------------------|
| <u>Project Features</u> | <u>STATSGO Soil Factors</u> | <u>Land Status</u> |
| Site Boundary | Morrow | Private |

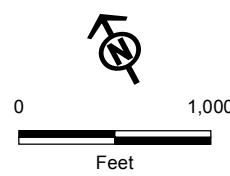
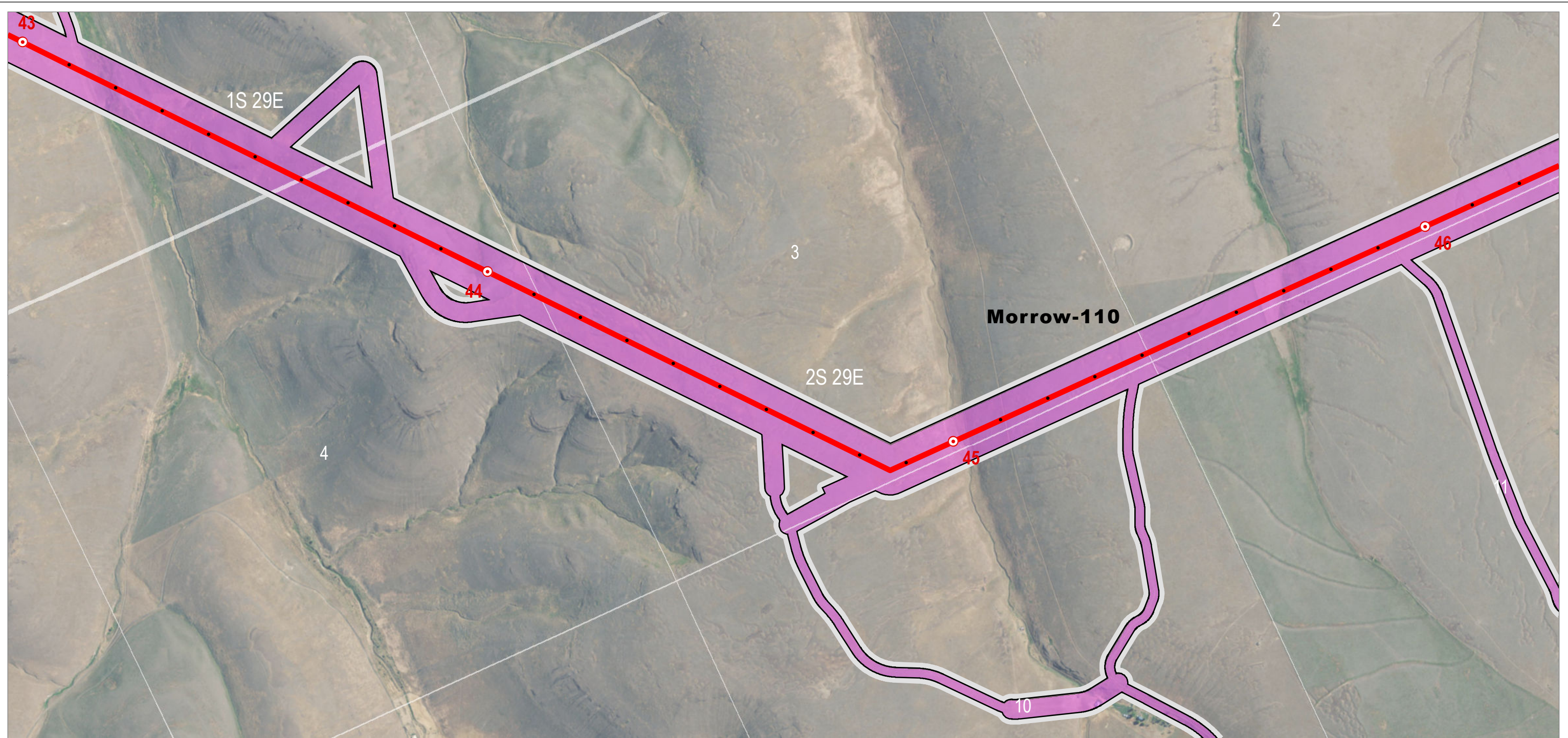
IDAHO POWER
AN IDACORP COMPANY

Boardman to Hemingway
Transmission Line Project

**Attachment I-1
Soil Mapping Units**

Proposed Route
Morrow County

Map 20



Project Features

- Site Boundary
- Proposed Route

Mileposts

- Mile
- Tenth-mile

STATSGO Soil Factors

- Morrow

Land Status

- Private



Boardman to Hemingway
Transmission Line Project

**Attachment I-1
Soil Mapping Units**

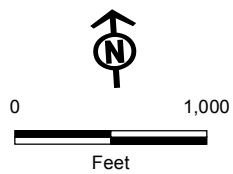
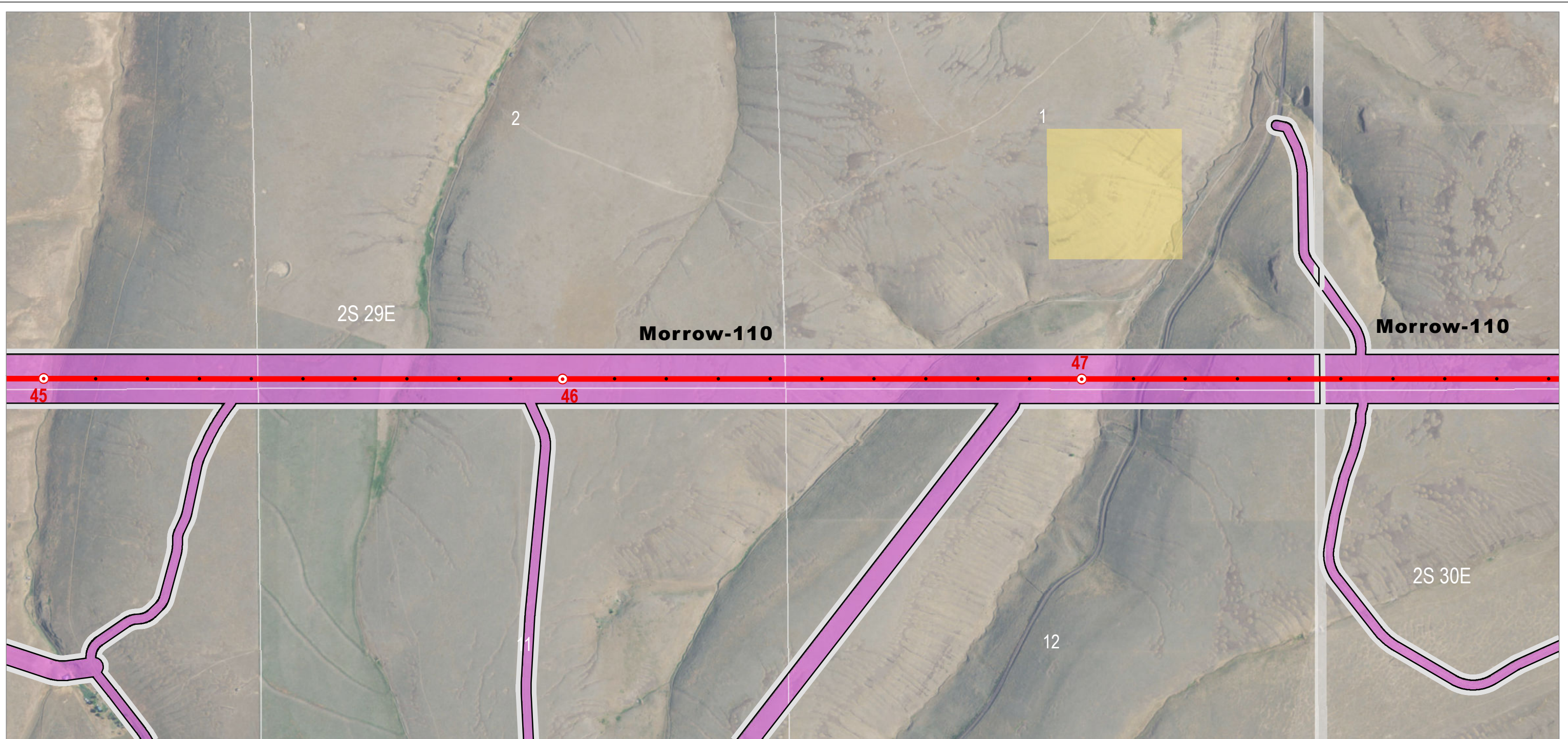
Proposed Route
Morrow County

Map 21

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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Project Features

- Site Boundary
- Proposed Route
- Mileposts**
- Mile
- Tenth-mile

STATSGO Soil Factors

- Morrow

Land Status

- Bureau of Land Management
- Private



Boardman to Hemingway
Transmission Line Project

**Attachment I-1
Soil Mapping Units**

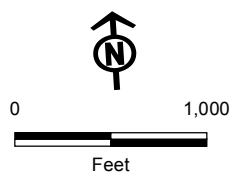
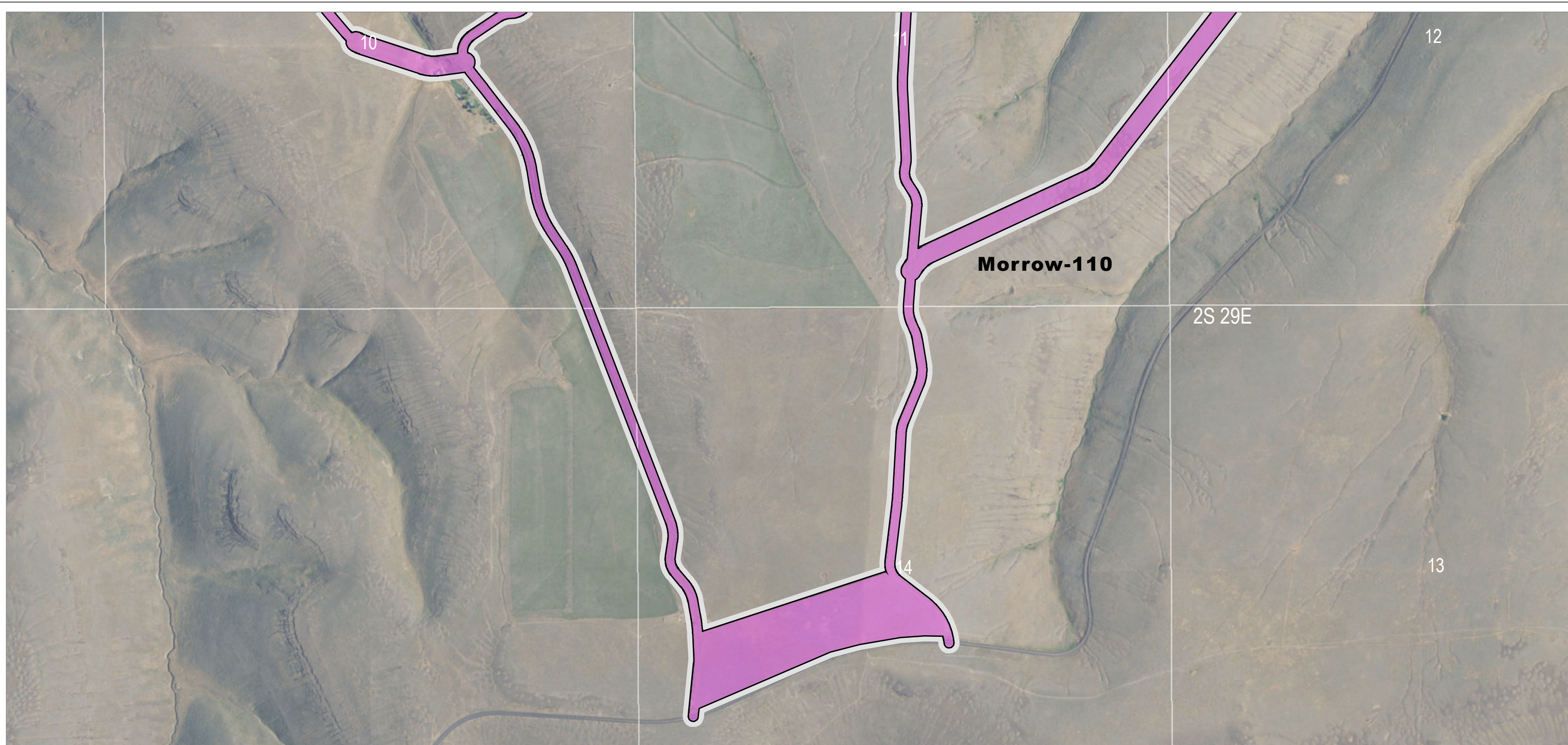
Proposed Route
Morrow County

Map 22

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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June 2017



Project Features
 Site Boundary

STATSGO Soil Factors
 Morrow

Land Status
 Private



Boardman to Hemingway
 Transmission Line Project

**Attachment I-1
 Soil Mapping Units**

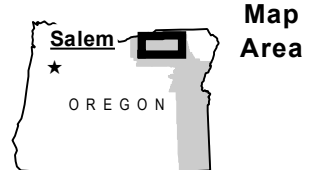
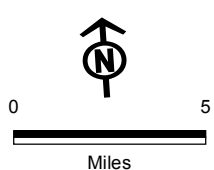
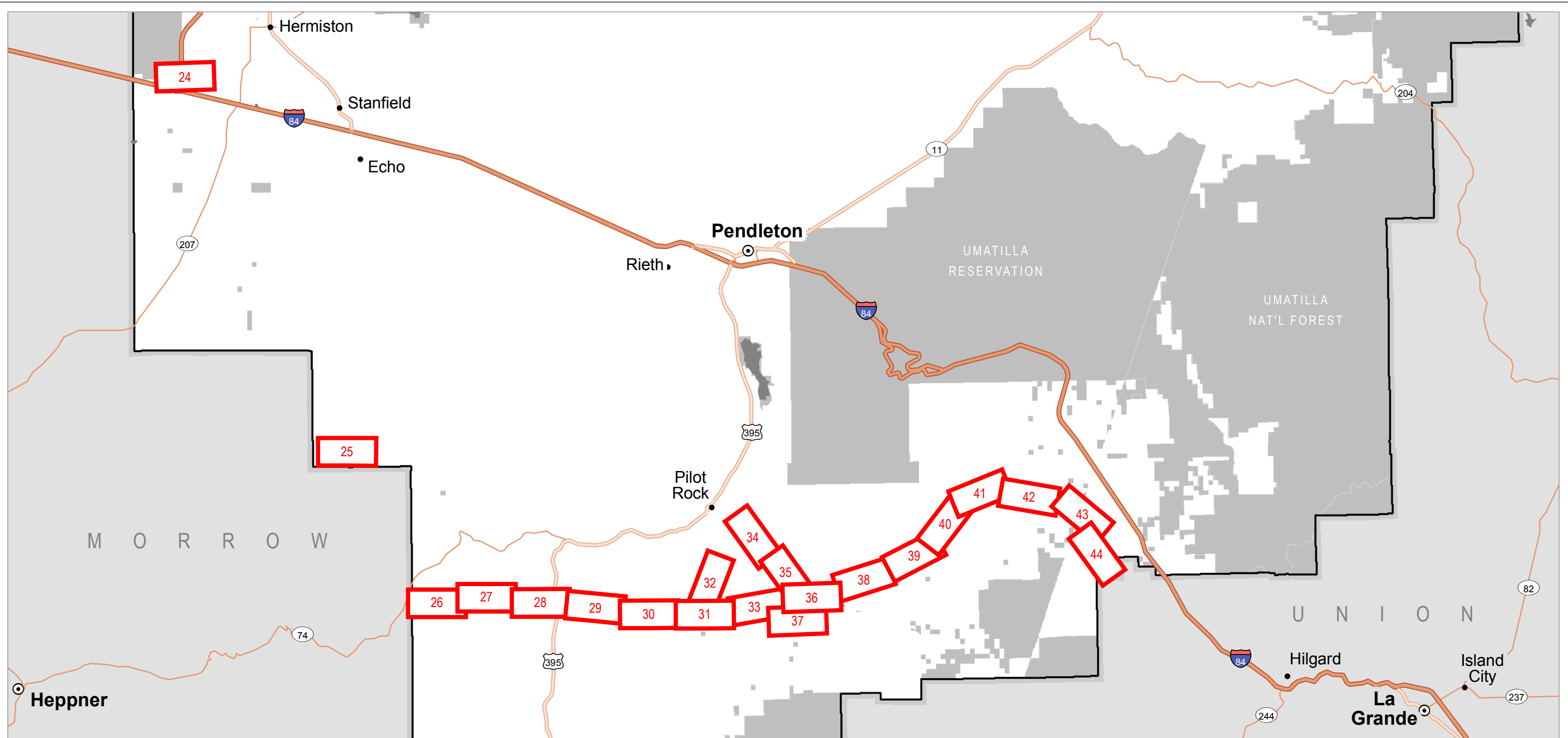
Proposed Route
 Morrow County

Map 23

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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June 2017

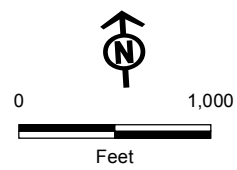
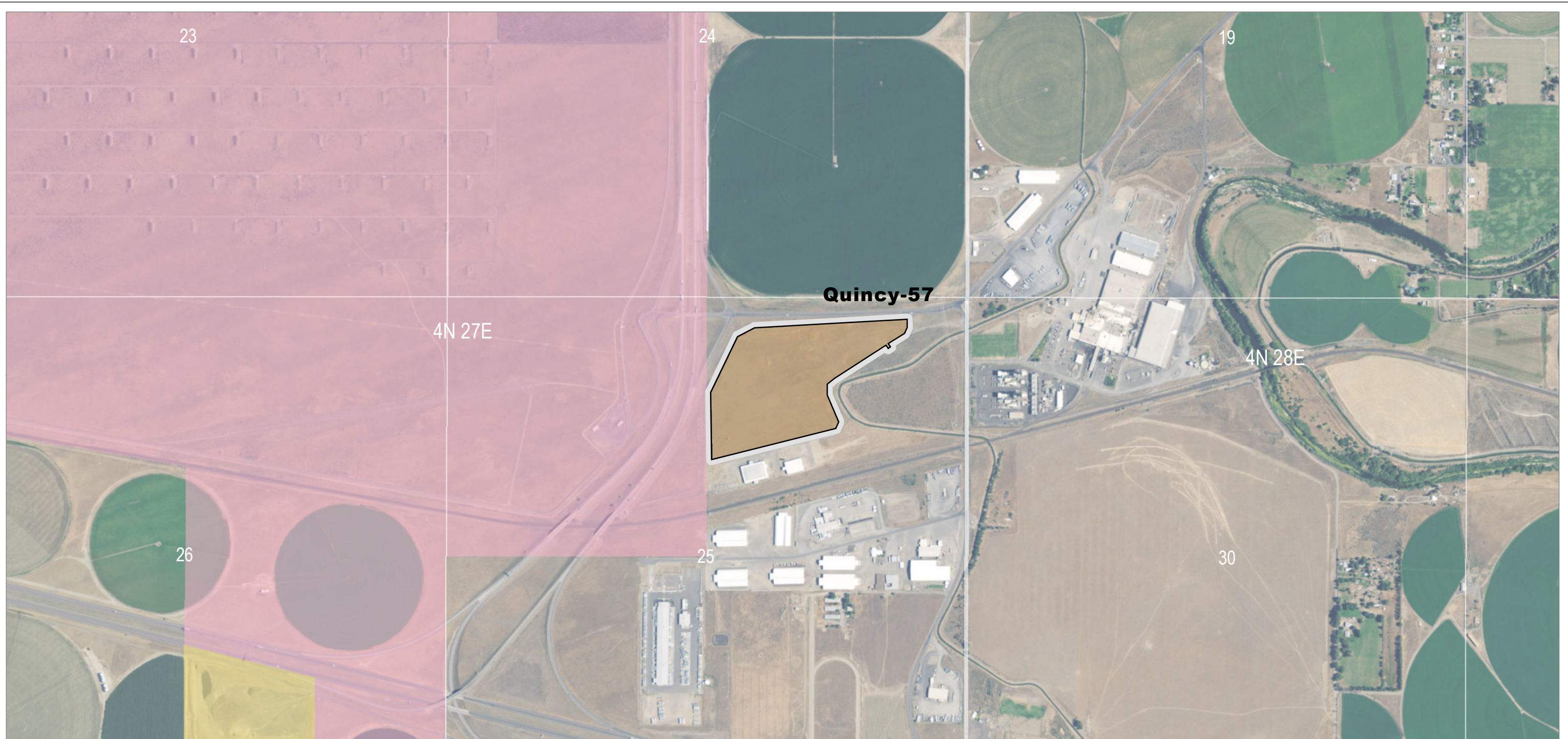


Map Index
 [Red Box] Location Map (Map #)

IDAHO POWER
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 Boardman to Hemingway
 Transmission Line Project

Attachment I-1
Soil Mapping Units
Location Maps
 Umatilla County
 Map Index

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo
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Project Features
 □ Site Boundary

STATSGO Soil Factors
 ■ Quincy

Land Status
 ■ Bureau of Land Management
 ■ Military Reservation or Corps of Engineers
 □ Private

IDAHO POWER
 An IDACORP Company
 Boardman to Hemingway
 Transmission Line Project

**Attachment I-1
 Soil Mapping Units**

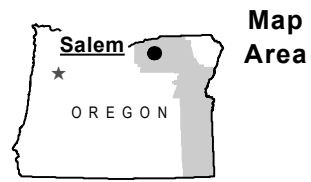
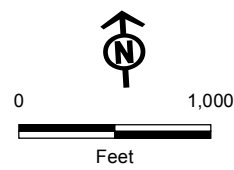
Proposed Route
 Umatilla County

Map 24

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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June 2017



Project Features

Site Boundary

STATSGO Soil Factors

Hermiston

Land Status

Private



Boardman to Hemingway
Transmission Line Project

**Attachment I-1
Soil Mapping Units**

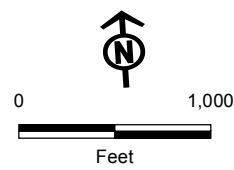
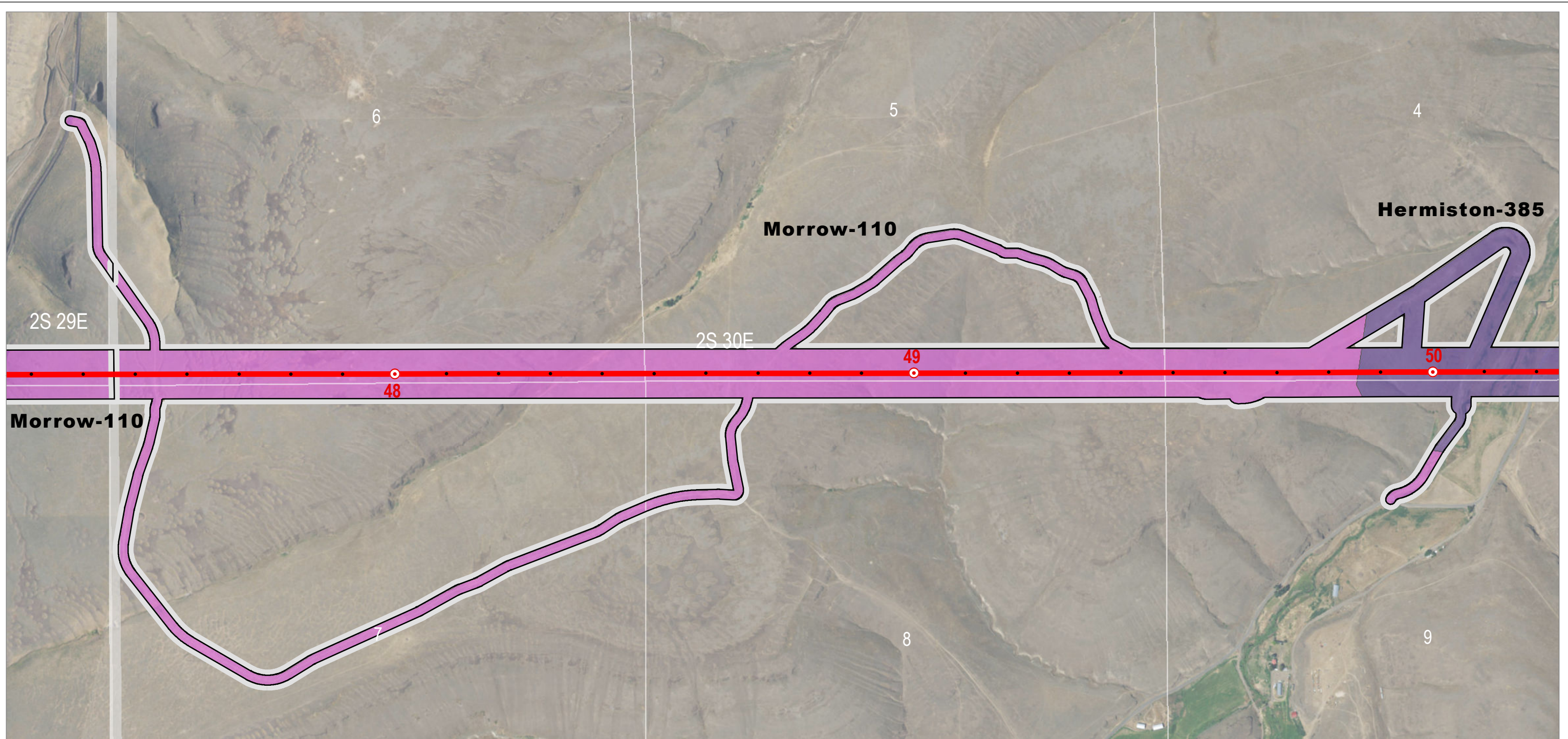
Proposed Route
Umatilla County

Map 25

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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June 2017



Project Features

- Site Boundary
- Proposed Route

Mileposts

- Mile
- Tenth-mile

STATSGO Soil Factors

- Hermiston
- Morrow

Land Status

- Private



Boardman to Hemingway
Transmission Line Project

**Attachment I-1
Soil Mapping Units**

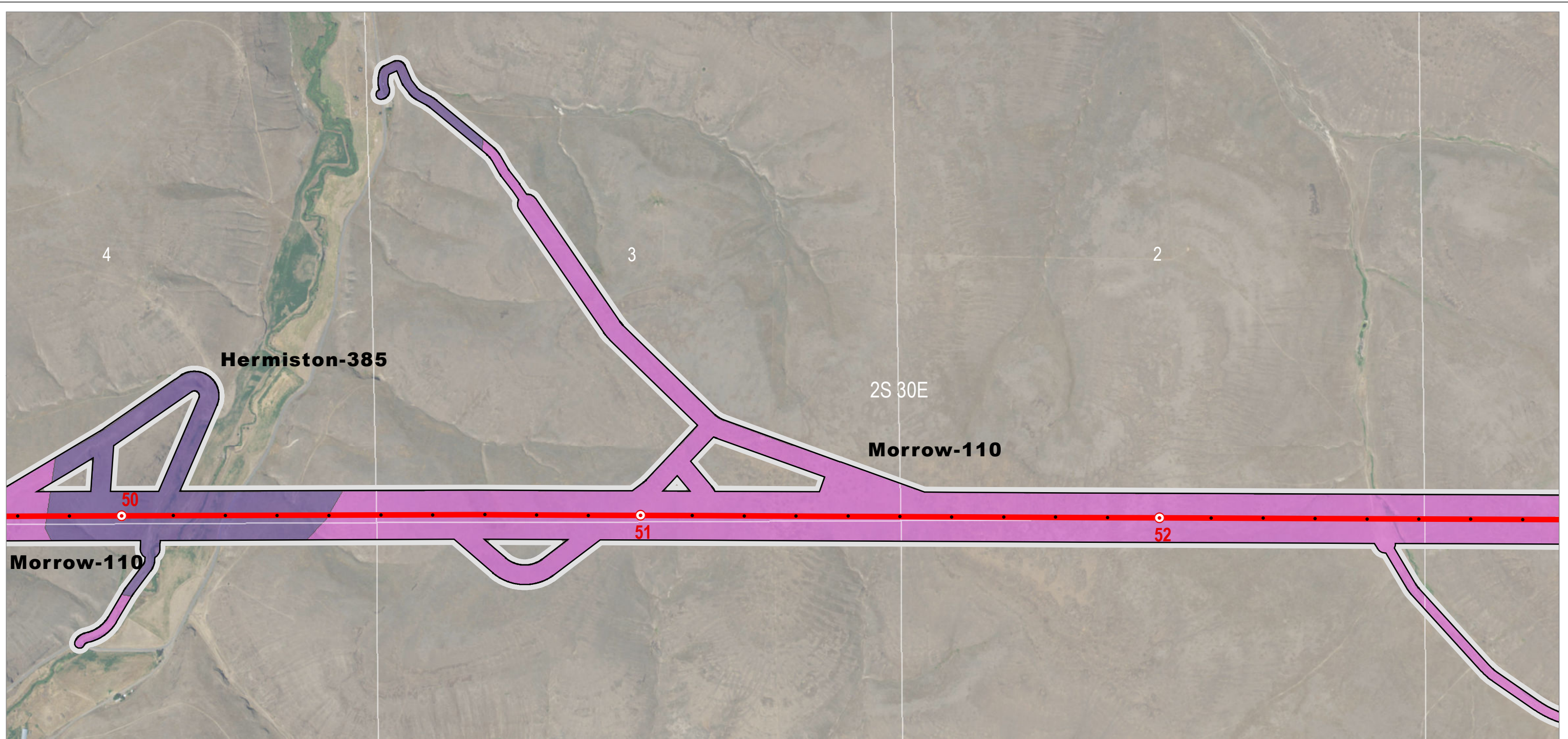
Proposed Route
Umatilla County

Map 26

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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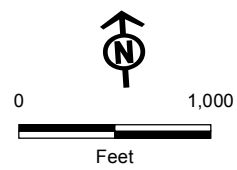
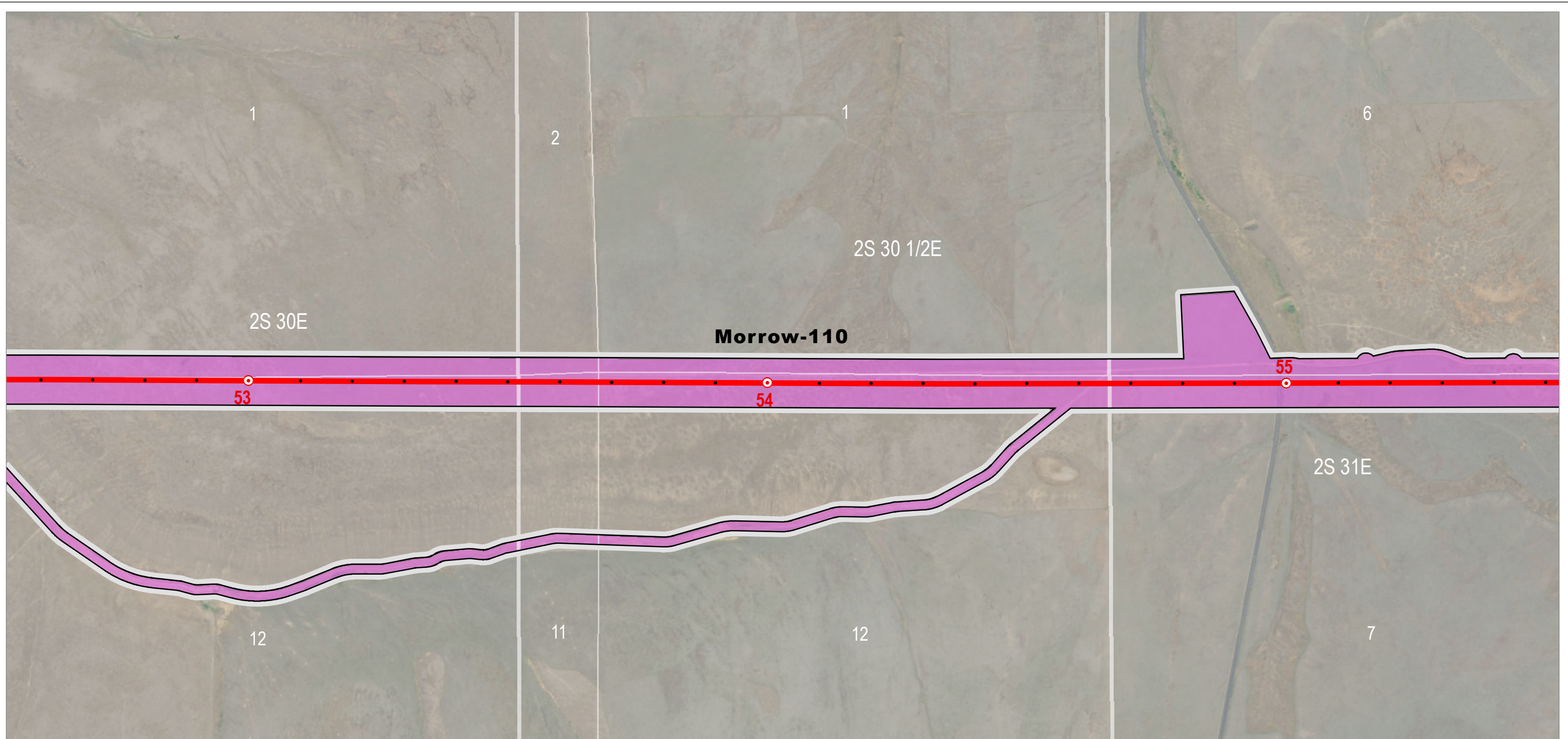
June 2017



- | Project Features | STATSGO Soil Factors | Land Status |
|------------------|----------------------|-------------|
| Site Boundary | Hermiston | Private |
| Proposed Route | Morrow | |
| Mileposts | | |
| Mile | | |
| Tenth-mile | | |

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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Project Features

- Site Boundary
- Proposed Route

Mileposts

- Mile
- Tenth-mile

STATSGO Soil Factors

- Morrow

Land Status

- Private



Boardman to Hemingway
Transmission Line Project

**Attachment I-1
Soil Mapping Units**

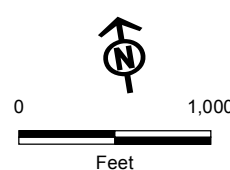
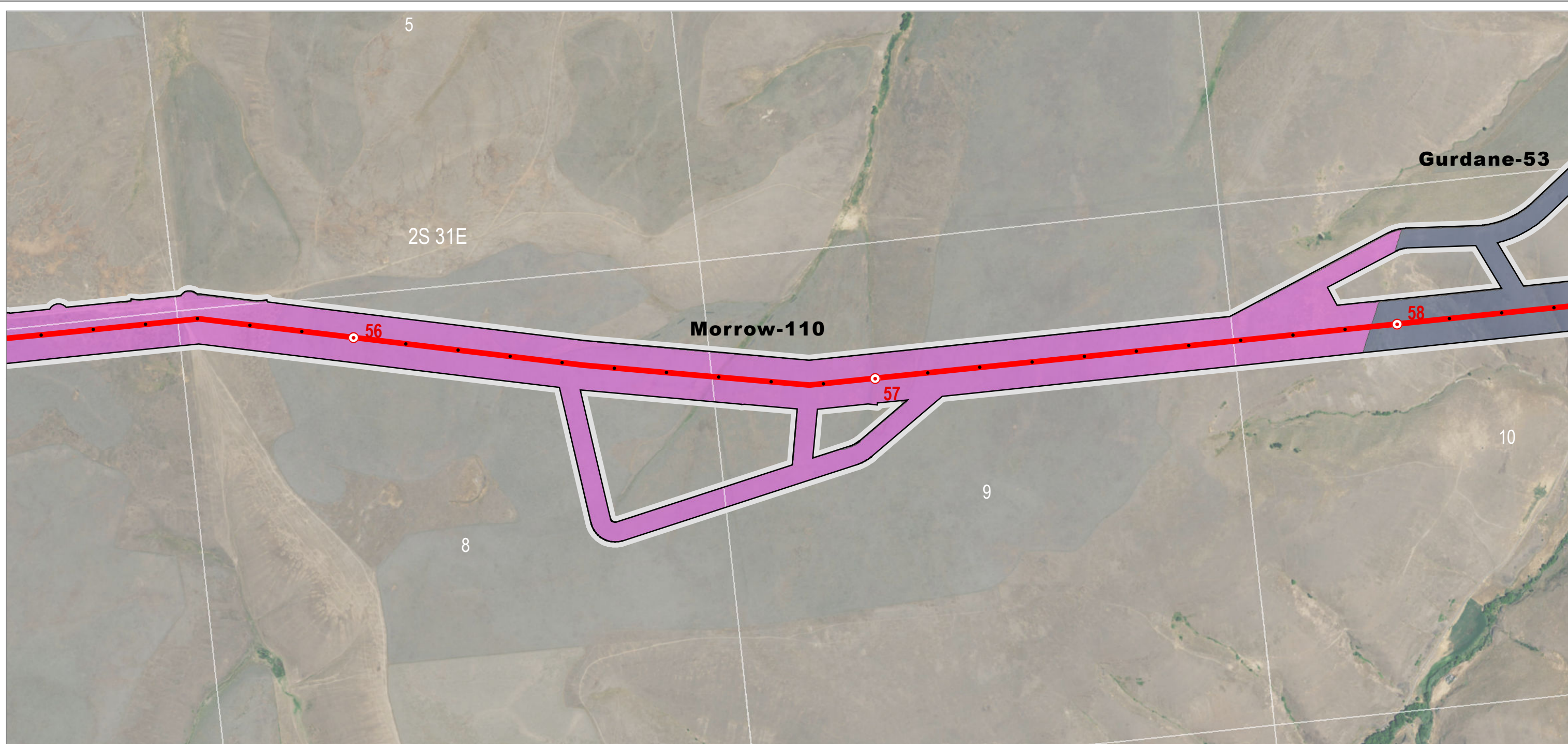
Proposed Route
Umatilla County

Map 28

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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June 2017



Project Features

- Site Boundary
- Proposed Route

Mileposts

- Mile
- Tenth-mile

STATSGO Soil Factors

- Gurdane
- Morrow

Land Status

- Private



Boardman to Hemingway
Transmission Line Project

**Attachment I-1
Soil Mapping Units**

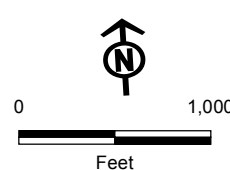
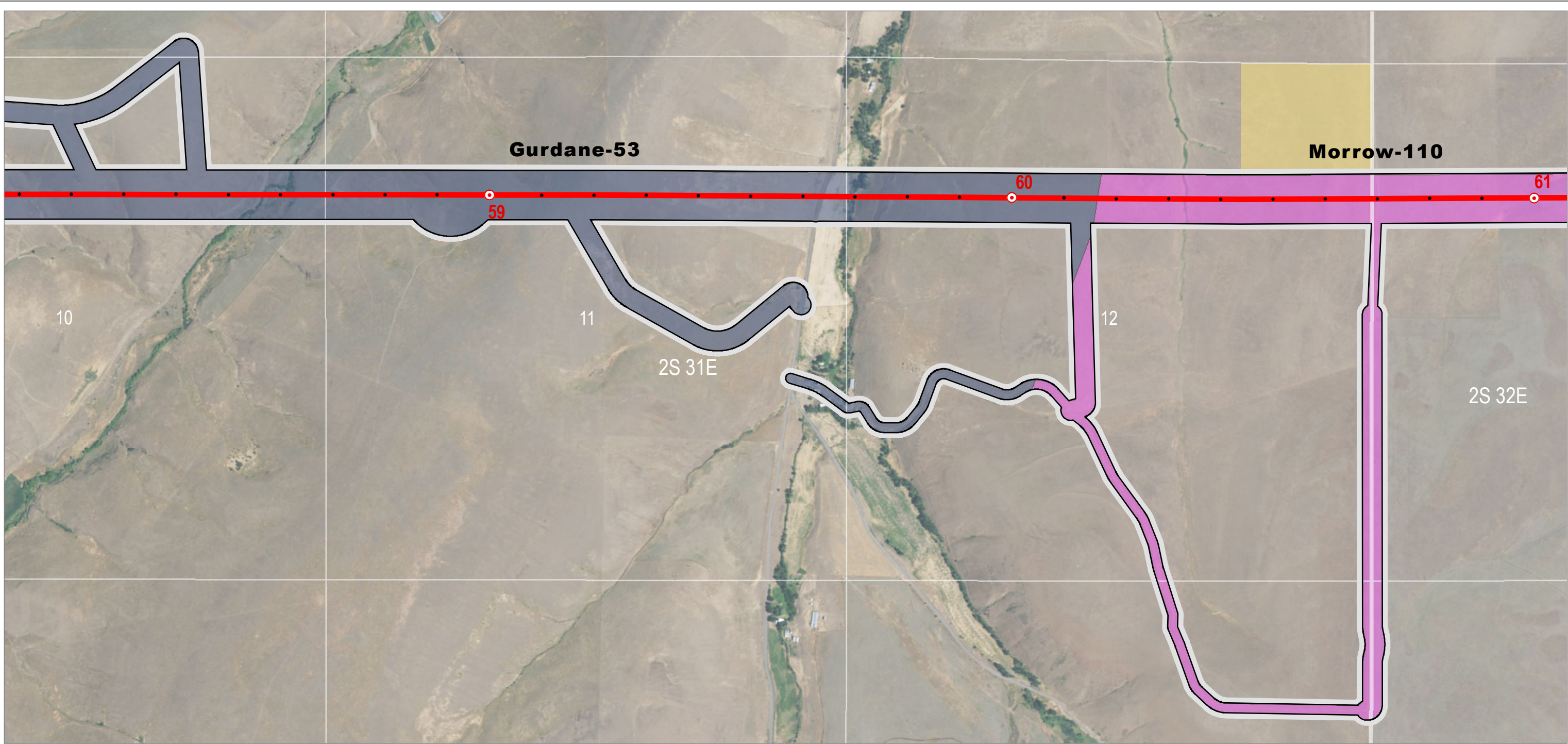
Proposed Route
Umatilla County

Map 29

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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June 2017



Project Features

- Site Boundary
- Proposed Route
- Mileposts**
- Mile
- Tenth-mile

STATSGO Soil Factors

- Gurdane
- Morrow

Land Status

- Bureau of Land Management
- Private

IDAHO POWER
An IDACORP Company

Boardman to Hemingway
Transmission Line Project

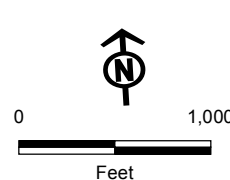
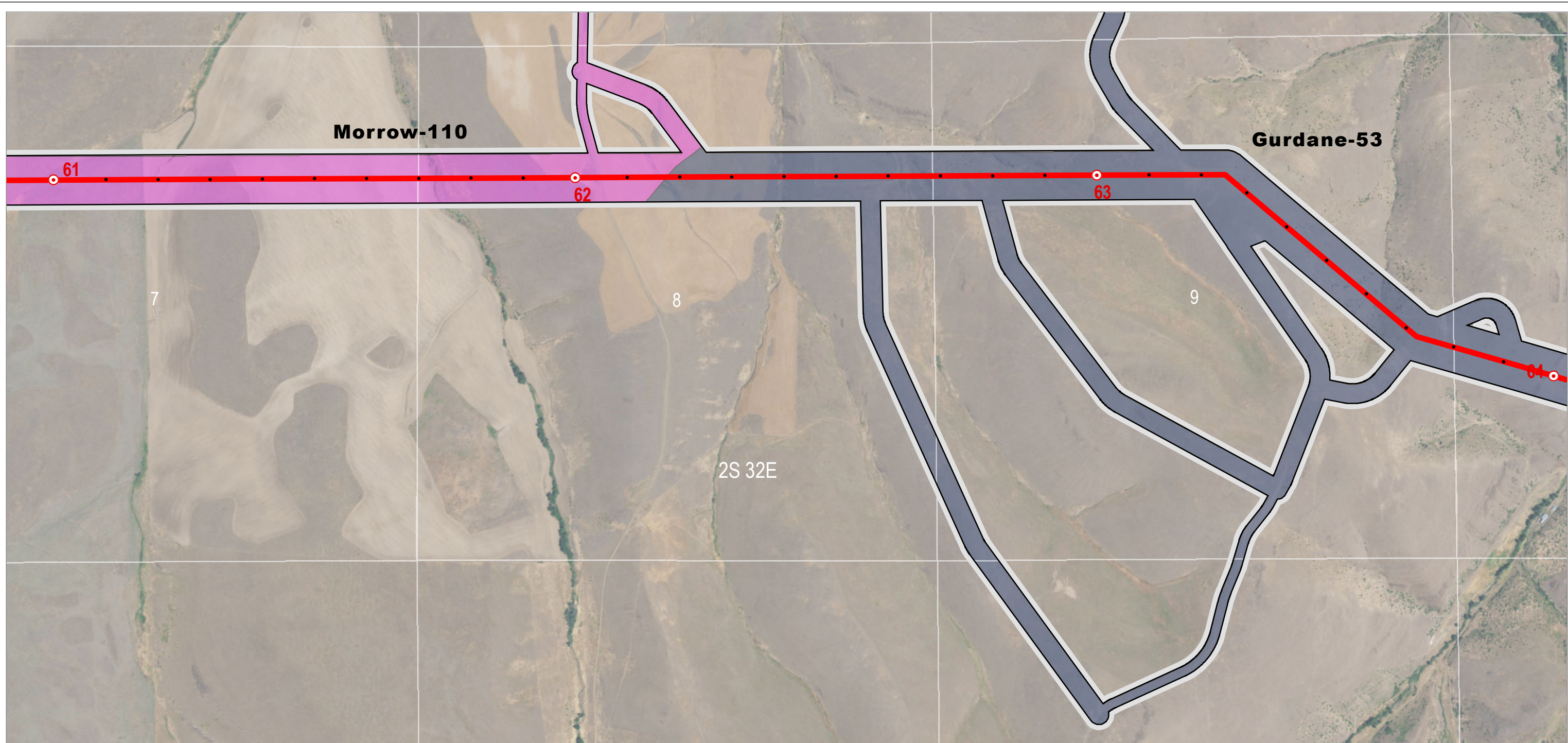
**Attachment I-1
Soil Mapping Units**

Proposed Route
Umatilla County

Map 30

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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Project Features

- Site Boundary
- Proposed Route

Mileposts

- Mile
- Tenth-mile

STATSGO Soil Factors

- Gurdane
- Morrow

Land Status

- Private



Boardman to Hemingway
Transmission Line Project

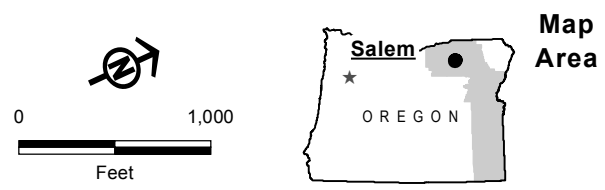
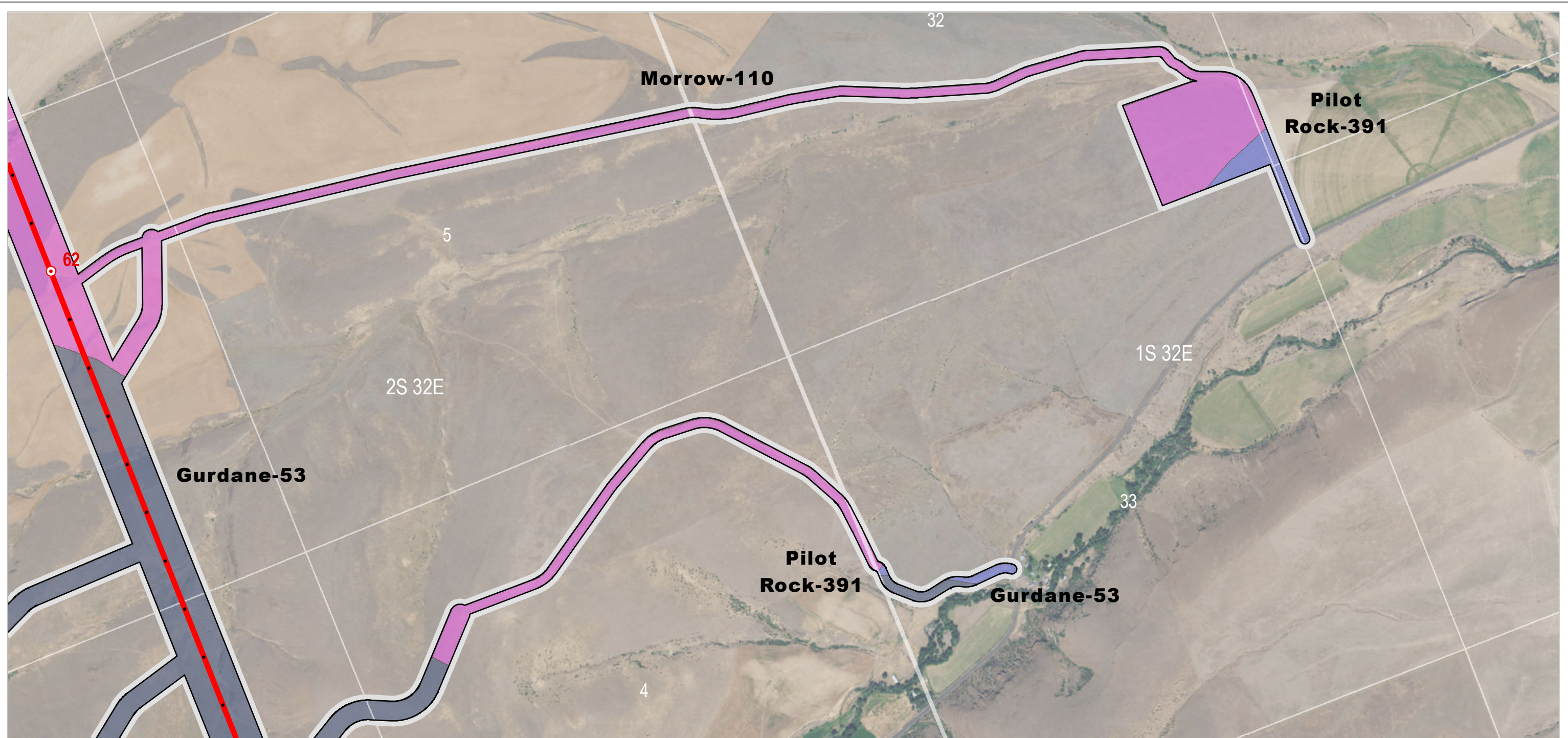
**Attachment I-1
Soil Mapping Units**

Proposed Route
Umatilla County

Map 31

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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|-------------------------|-----------------------------|--------------------|
| Project Features | STATSGO Soil Factors | Land Status |
| □ Site Boundary | ■ Gurdane | □ Private |
| — Proposed Route | ■ Morrow | |
| Mileposts | ■ Pilot Rock | |
| ○ Mile | | |
| • Tenth-mile | | |

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Boardman to Hemingway
Transmission Line Project

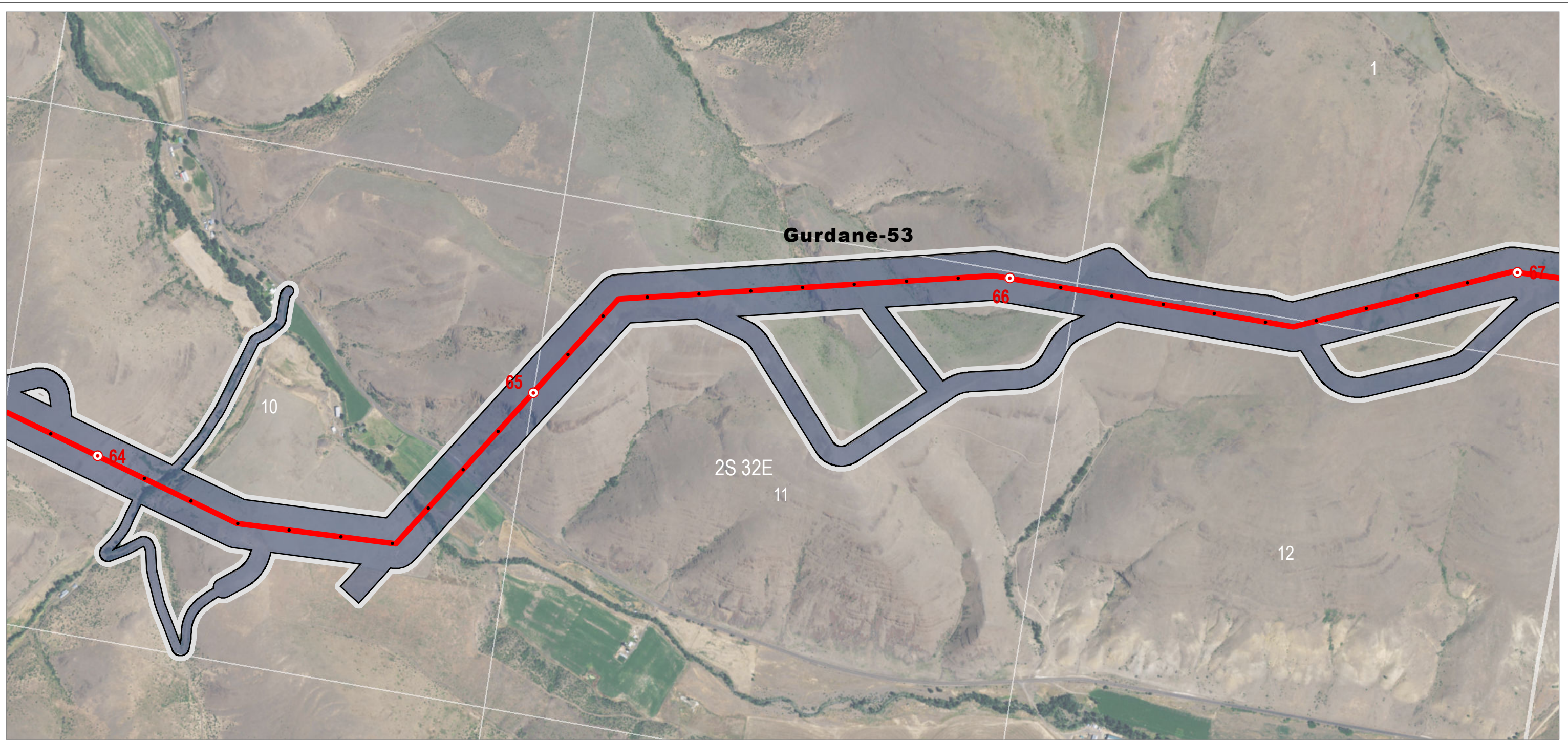
**Attachment I-1
Soil Mapping Units**

Proposed Route
Umatilla County

Map 32

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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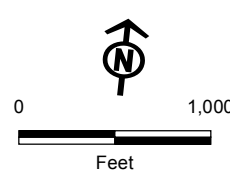
Gurdane-53

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- | | | |
|-------------------------|-----------------------------|--------------------|
| Project Features | STATSGO Soil Factors | Land Status |
| □ Site Boundary | ■ Gurdane | □ Private |
| — Proposed Route | | |
| Mileposts | | |
| ○ Mile | | |
| • Tenth-mile | | |

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Transmission Line Project

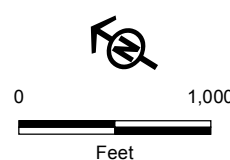
**Attachment I-1
Soil Mapping Units**

Proposed Route
Umatilla County

Map 33

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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|-------------------------|-----------------------------|--------------------|
| Project Features | STATSGO Soil Factors | Land Status |
| Site Boundary | Gurdane | Private |
| | Pilot Rock | |

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Boardman to Hemingway
Transmission Line Project

**Attachment I-1
Soil Mapping Units**

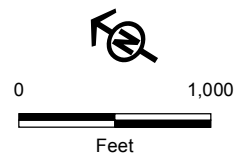
Proposed Route
Umatilla County

Map 34

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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June 2017



Project Features

- Site Boundary
- Proposed Route

Mileposts

- Mile
- Tenth-mile

STATSGO Soil Factors

- Gurdane

Land Status

- Private



Boardman to Hemingway
Transmission Line Project

**Attachment I-1
Soil Mapping Units**

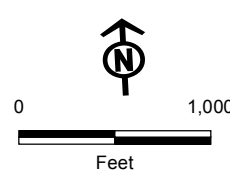
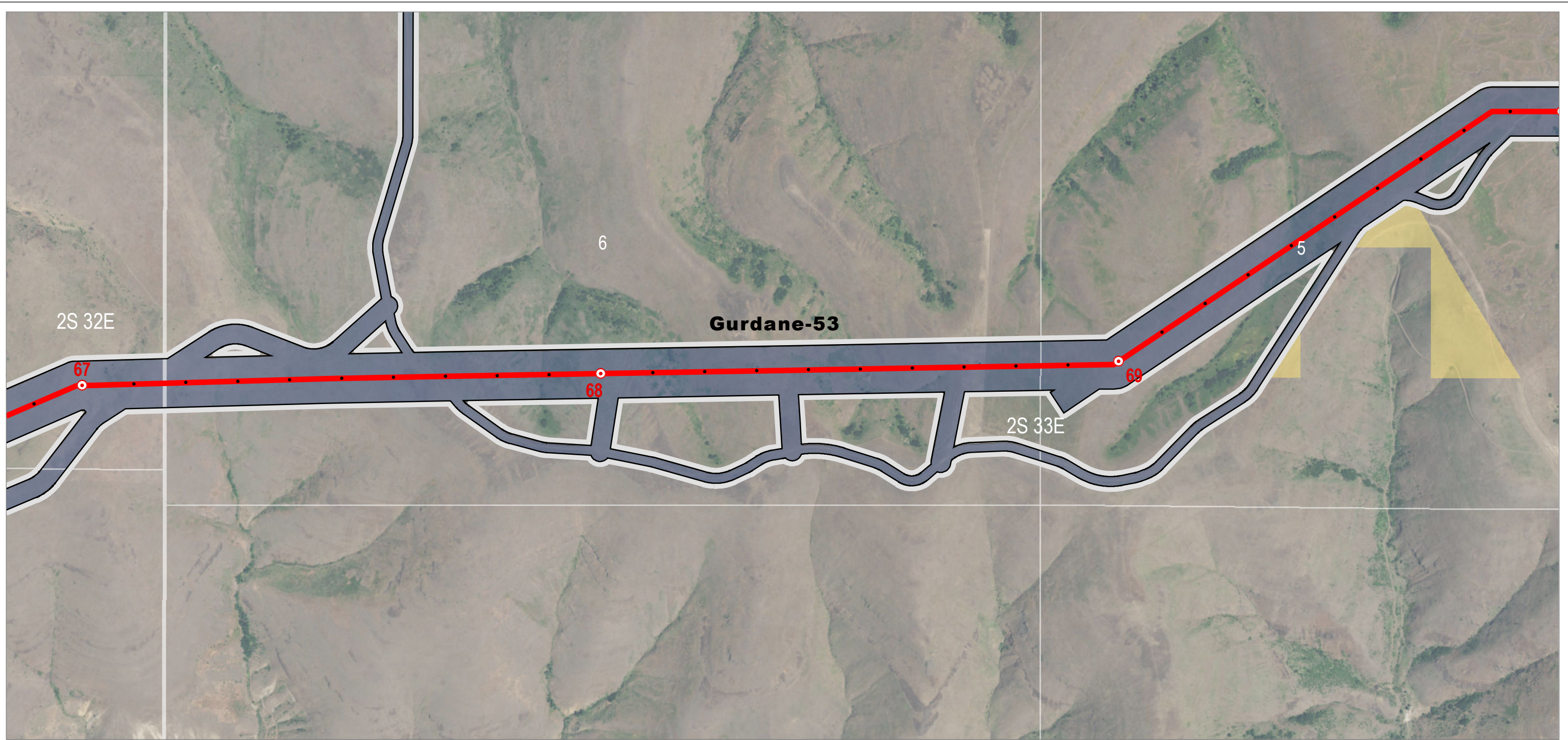
Proposed Route
Umatilla County

Map 35

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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June 2017



Project Features

- Site Boundary
- Proposed Route
- Mileposts**
- Mile
- Tenth-mile

STATSGO Soil Factors

- Gurdane

Land Status

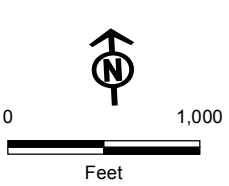
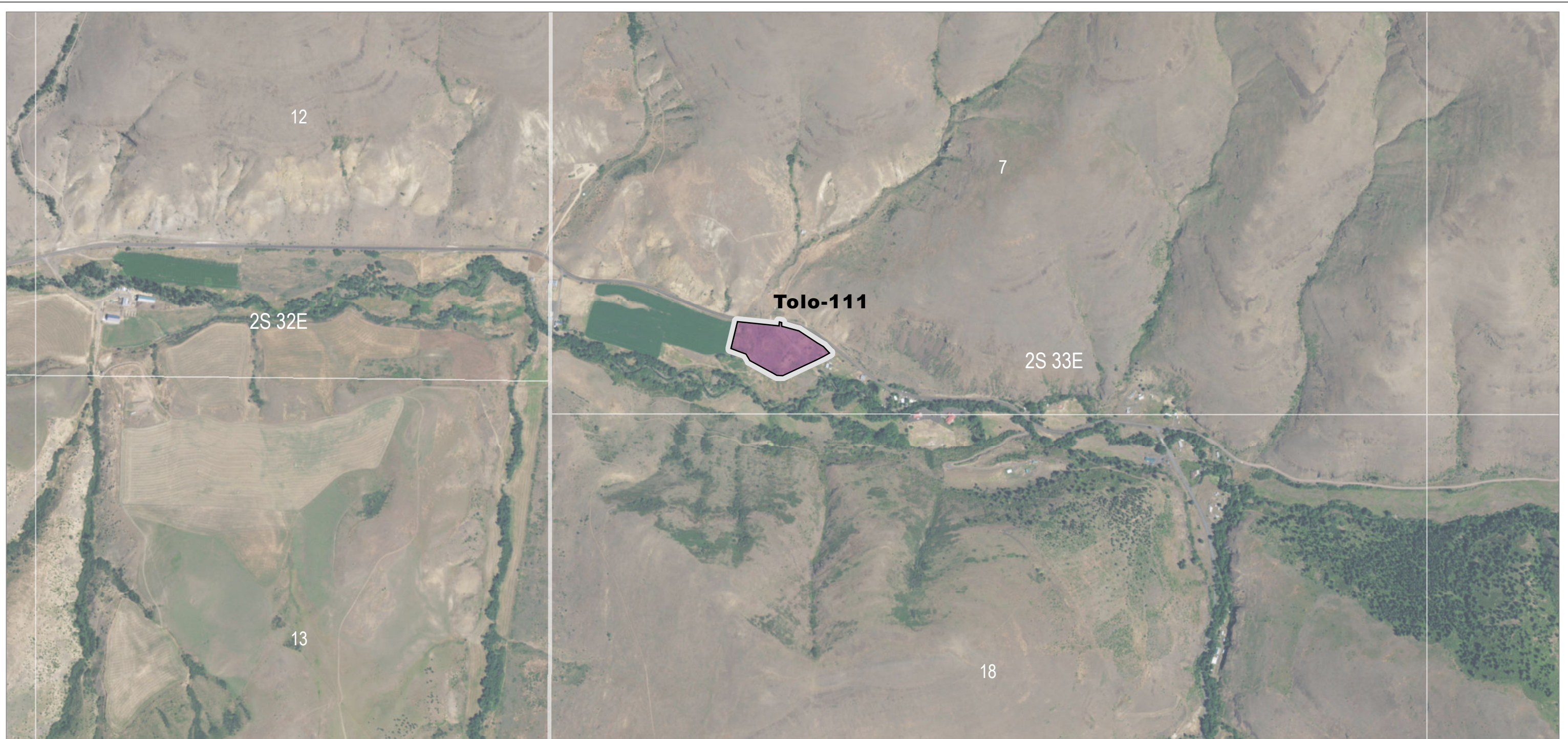
- Bureau of Land Management
- Private

**Attachment I-1
Soil Mapping Units**

Proposed Route
Umatilla County

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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Project Features
 [White outline] Site Boundary

STATSGO Soil Factors
 [Purple fill] Tolo

Land Status
 [White fill] Private

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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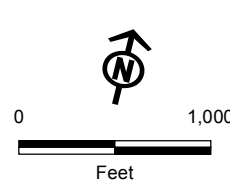
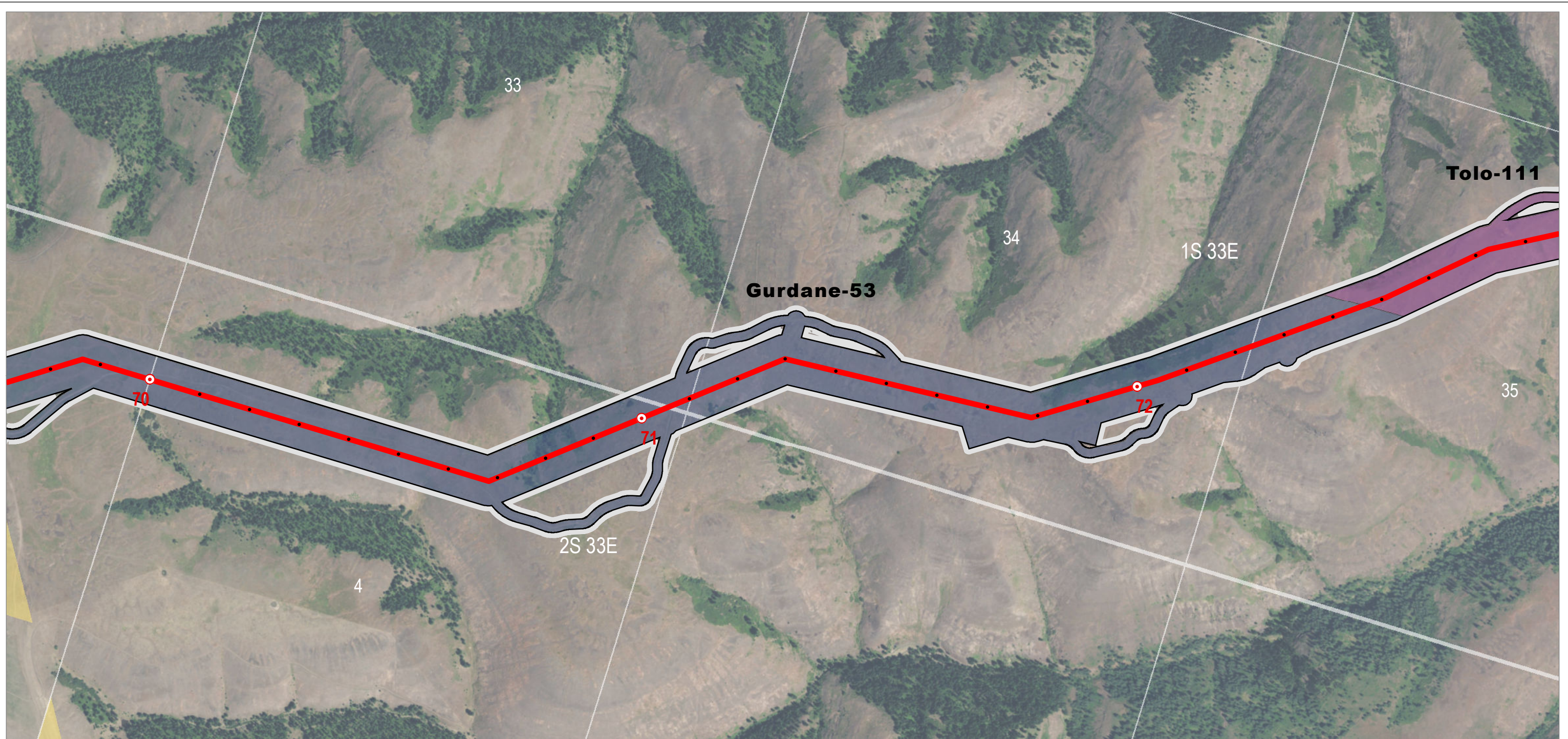
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IDAHO POWER
 An IDACORP Company
 Boardman to Hemingway
 Transmission Line Project

**Attachment I-1
 Soil Mapping Units**

Proposed Route
 Umatilla County

Map 37



- Project Features**
- Site Boundary
 - Proposed Route
- Mileposts**
- Mile
 - Tenth-mile

- STATSGO Soil Factors**
- Gurdane
 - Tolo

- Land Status**
- Bureau of Land Management
 - Private

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Transmission Line Project

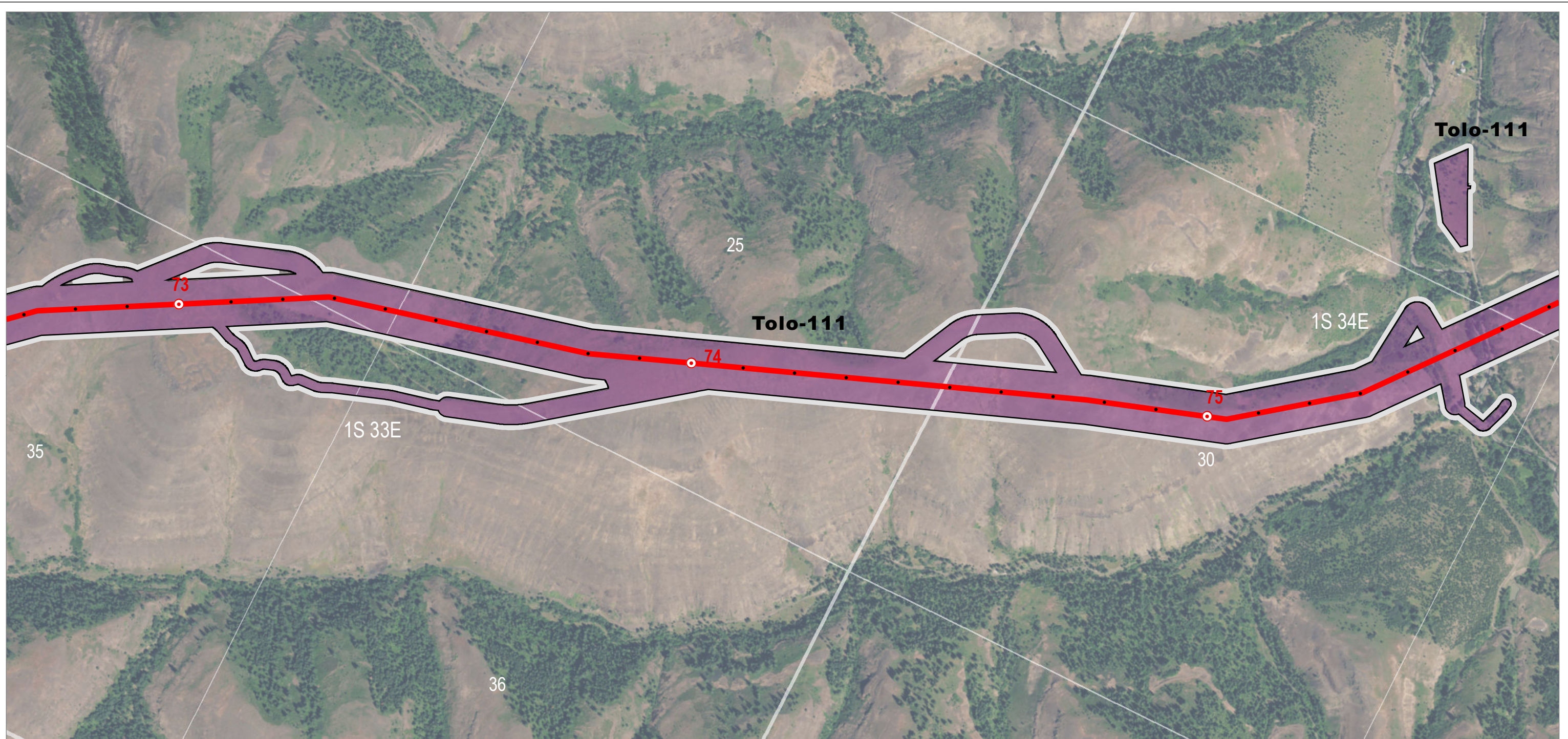
**Attachment I-1
Soil Mapping Units**

Proposed Route
Umatilla County

Map 38

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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Tolo-111

Tolo-111

1S 34E

1S 33E

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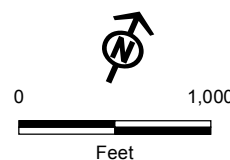
25

36

73

74

75



Map Area

Project Features

- Site Boundary
- Proposed Route

Mileposts

- Mile
- Tenth-mile

STATSGO Soil Factors

- Tolo

Land Status

- Private



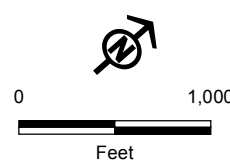
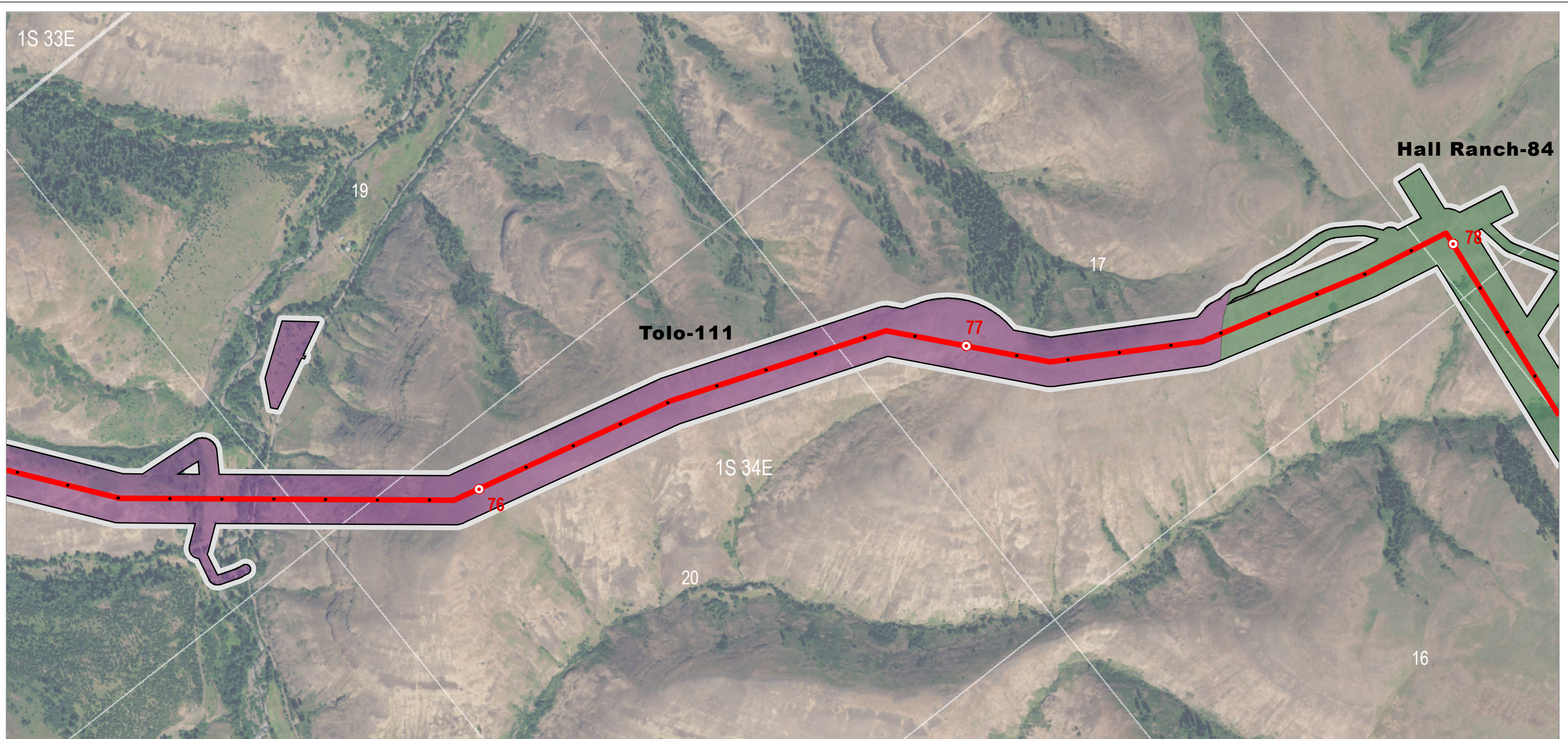
Boardman to Hemingway
Transmission Line Project

**Attachment I-1
Soil Mapping Units**

Proposed Route
Umatilla County

Map 39

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo
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|-------------------------|-----------------------------|--------------------|
| Project Features | STATSGO Soil Factors | Land Status |
| Site Boundary | Hall Ranch | Private |
| Proposed Route | Tolo | |
| Mileposts | | |
| Mile | | |
| Tenth-mile | | |

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Boardman to Hemingway
Transmission Line Project

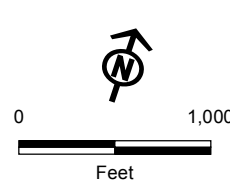
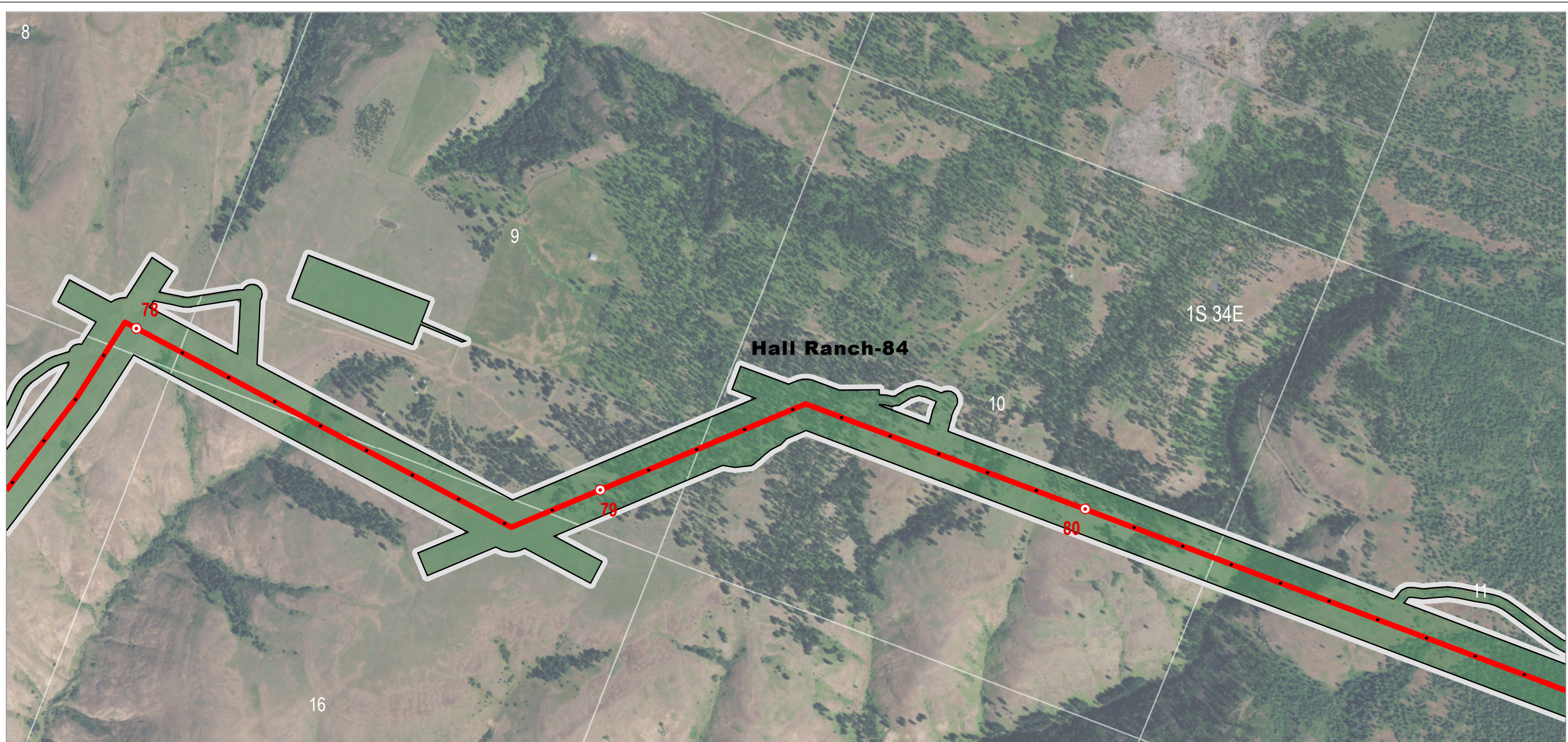
**Attachment I-1
Soil Mapping Units**

Proposed Route
Umatilla County

Map 40

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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- Project Features**
- Site Boundary
 - Proposed Route
- Mileposts**
- Mile
 - Tenth-mile

- STATSGO Soil Factors**
- Hall Ranch

- Land Status**
- Private

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Boardman to Hemingway
Transmission Line Project

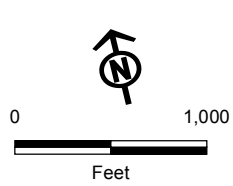
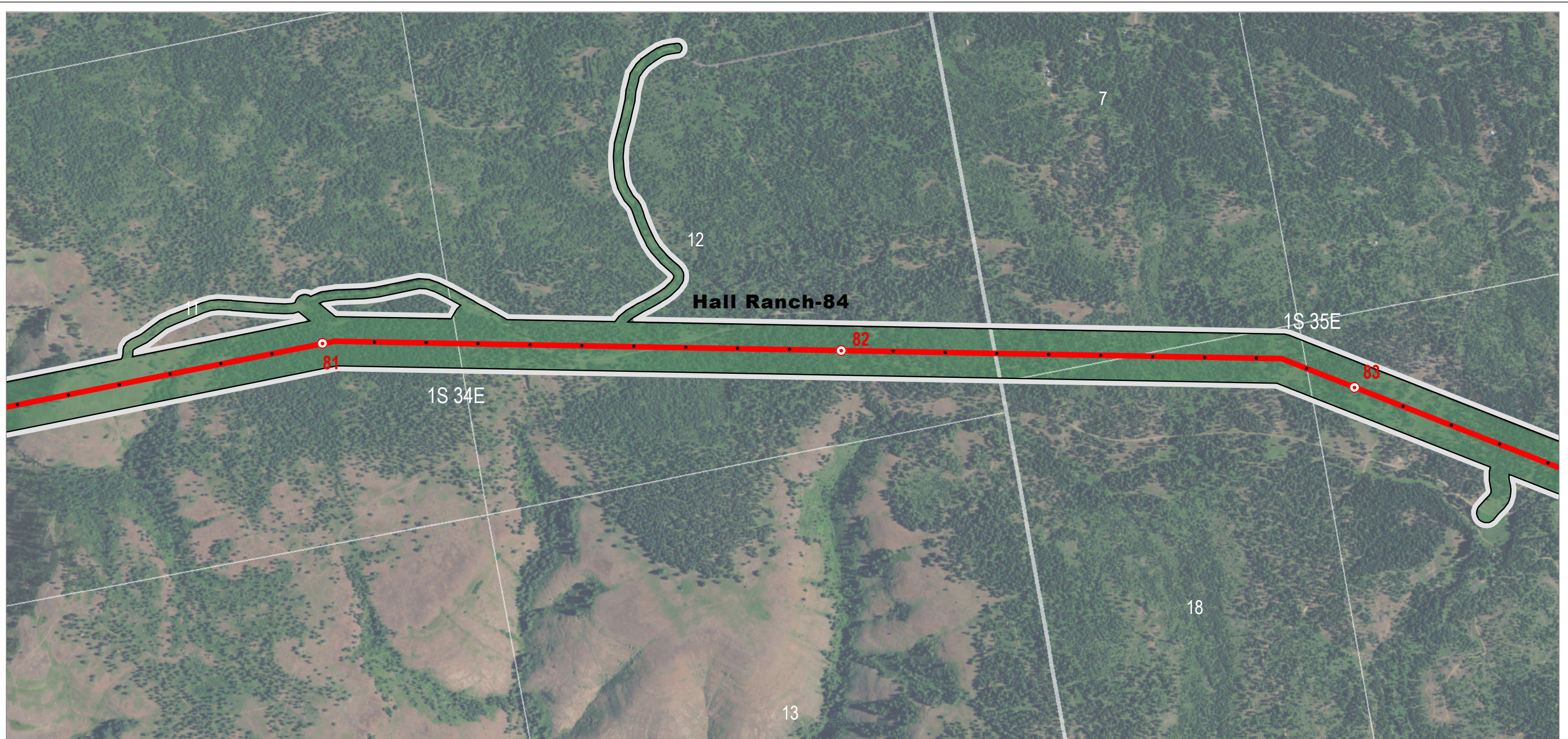
**Attachment I-1
Soil Mapping Units**

Proposed Route
Umatilla County

Map 41

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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Project Features

- Site Boundary
- Proposed Route

Mileposts

- Mile
- Tenth-mile

STATSGO Soil Factors

- Hall Ranch

Land Status

- Private



Boardman to Hemingway
Transmission Line Project

**Attachment I-1
Soil Mapping Units**

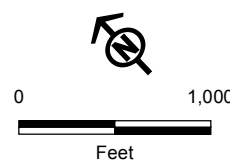
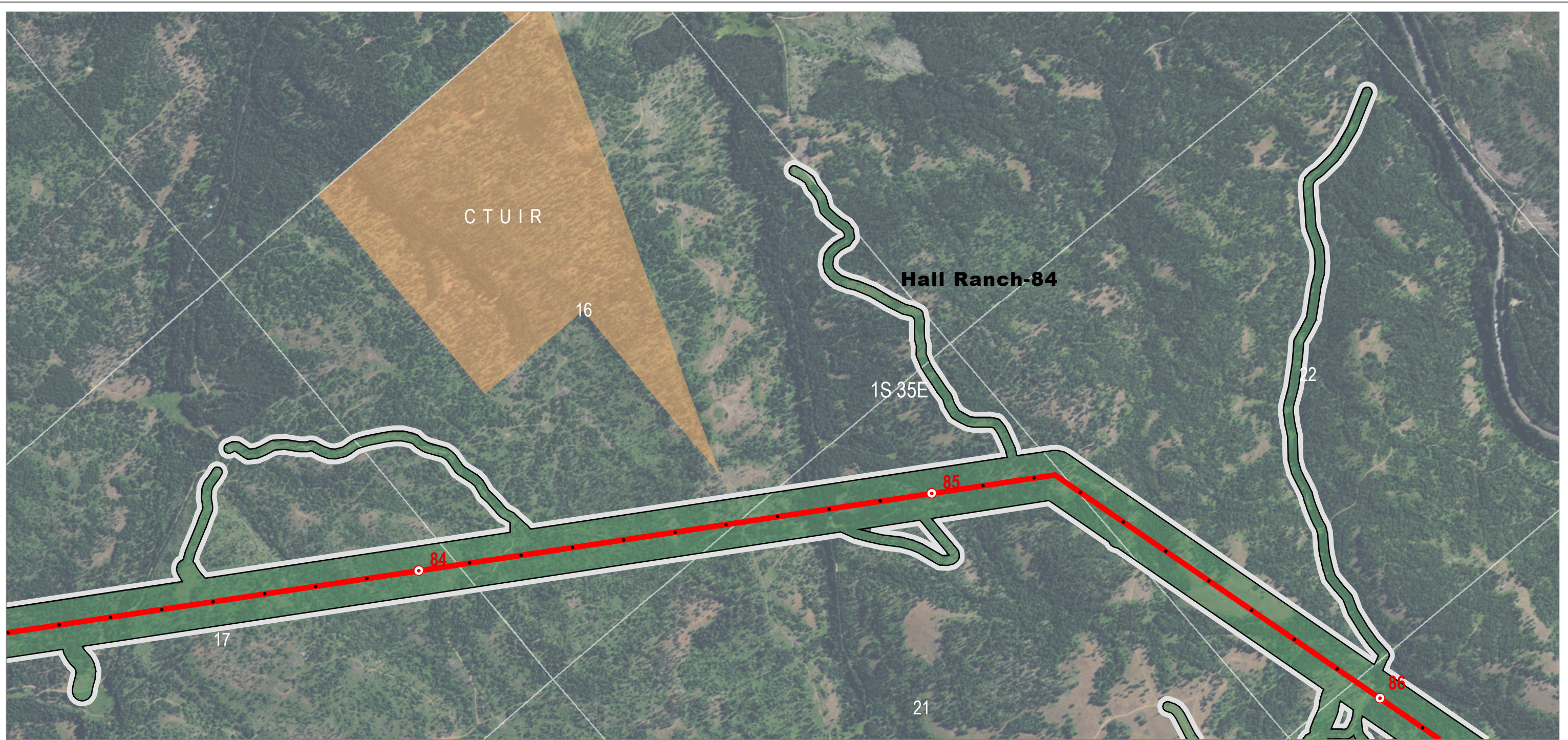
Proposed Route
Umatilla County

Map 42

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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June 2017



- Project Features**
- Site Boundary
 - Proposed Route
- Mileposts**
- Mile
 - Tenth-mile

- STATSGO Soil Factors**
- Hall Ranch

- Land Status**
- Indian Reservation
 - Private

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Boardman to Hemingway
Transmission Line Project

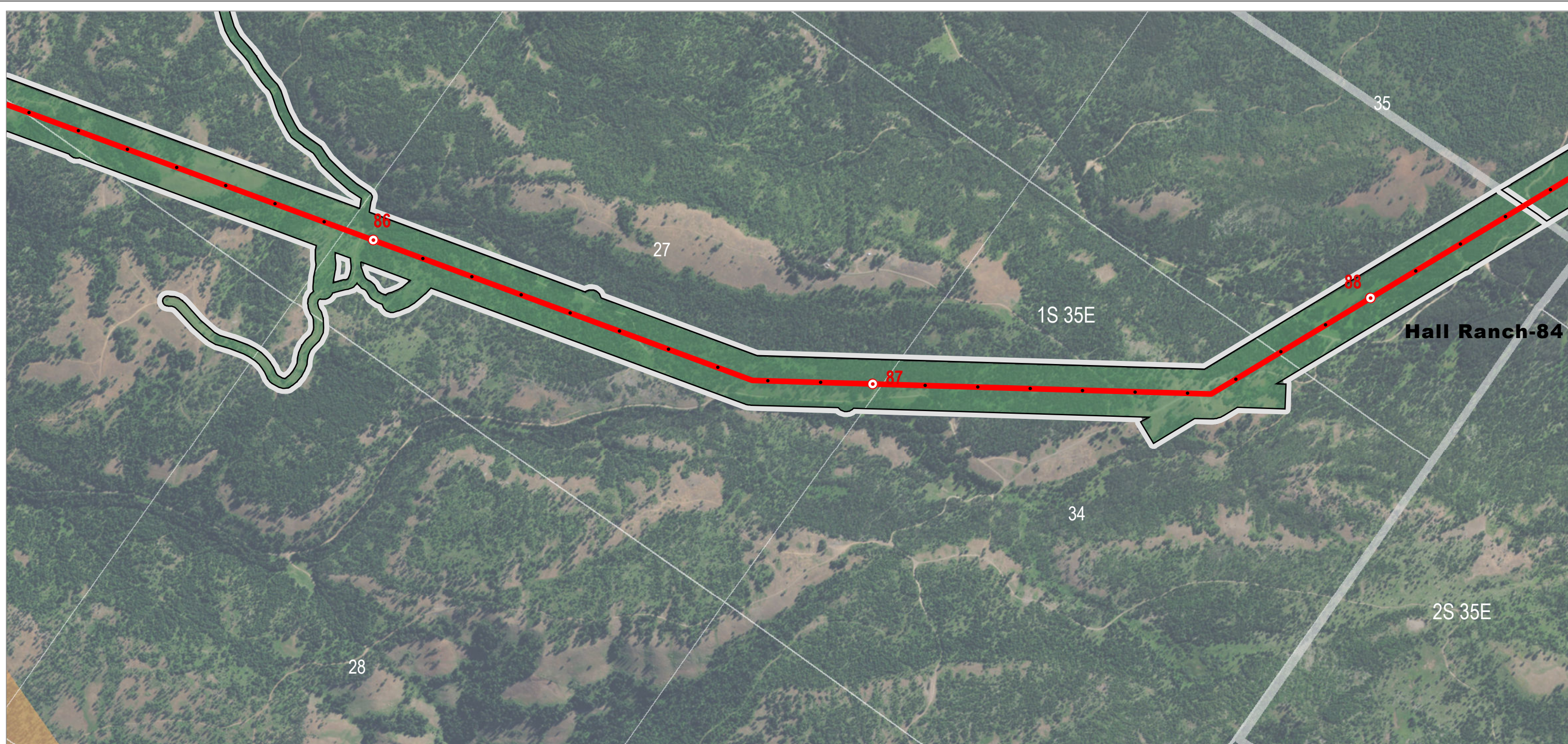
**Attachment I-1
Soil Mapping Units**

Proposed Route
Umatilla County

Map 43

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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|---|---|---|
| <p>Project Features</p> <ul style="list-style-type: none"> Site Boundary Proposed Route <p>Mileposts</p> <ul style="list-style-type: none"> Mile Tenth-mile | <p>STATSGO Soil Factors</p> <ul style="list-style-type: none"> Hall Ranch | <p>Land Status</p> <ul style="list-style-type: none"> Indian Reservation Private |
|---|---|---|

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Boardman to Hemingway
Transmission Line Project

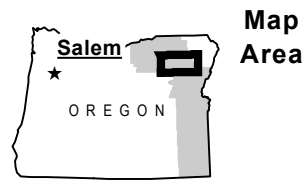
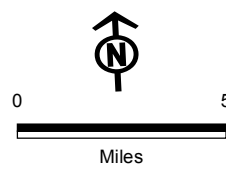
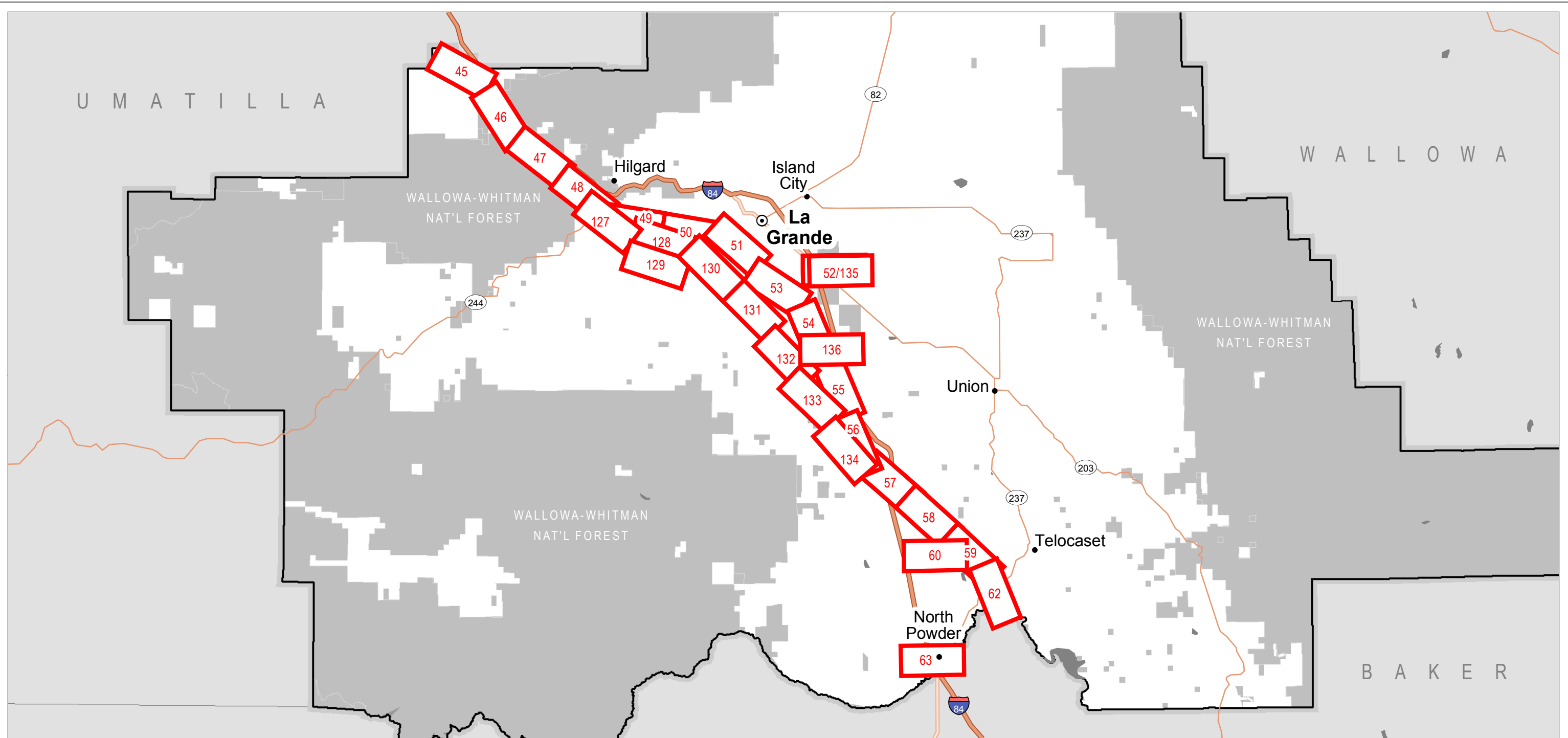
**Attachment I-1
Soil Mapping Units**

Proposed Route
Umatilla County

Map 44

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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June 2017

Map Index

Location Map (Map #)

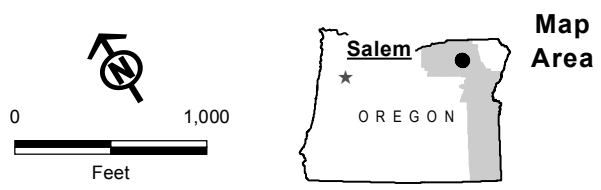
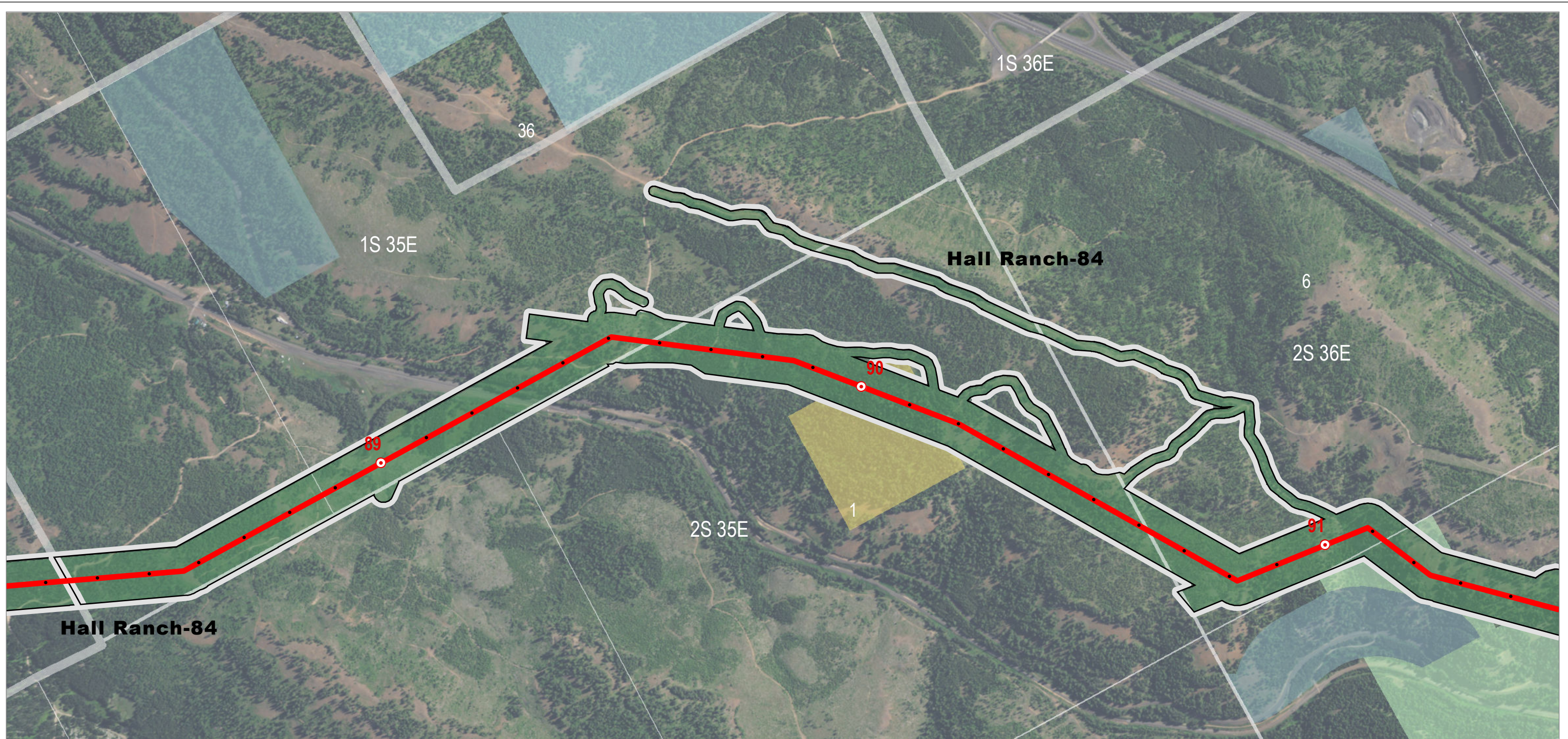


Boardman to Hemingway
Transmission Line Project

Attachment I-1
Soil Mapping Units
Location Maps

Union County

Map Index



- Project Features**
- Site Boundary
 - Proposed Route
- Mileposts**
- Mile
 - Tenth-mile

- STATSGO Soil Factors**
- Hall Ranch

- Land Status**
- Bureau of Land Management
 - Forest Service
 - Private
 - State or Local
 - State or Local Parks and Recreation or Wildlife

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Boardman to Hemingway
Transmission Line Project

**Attachment I-1
Soil Mapping Units**

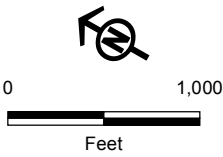
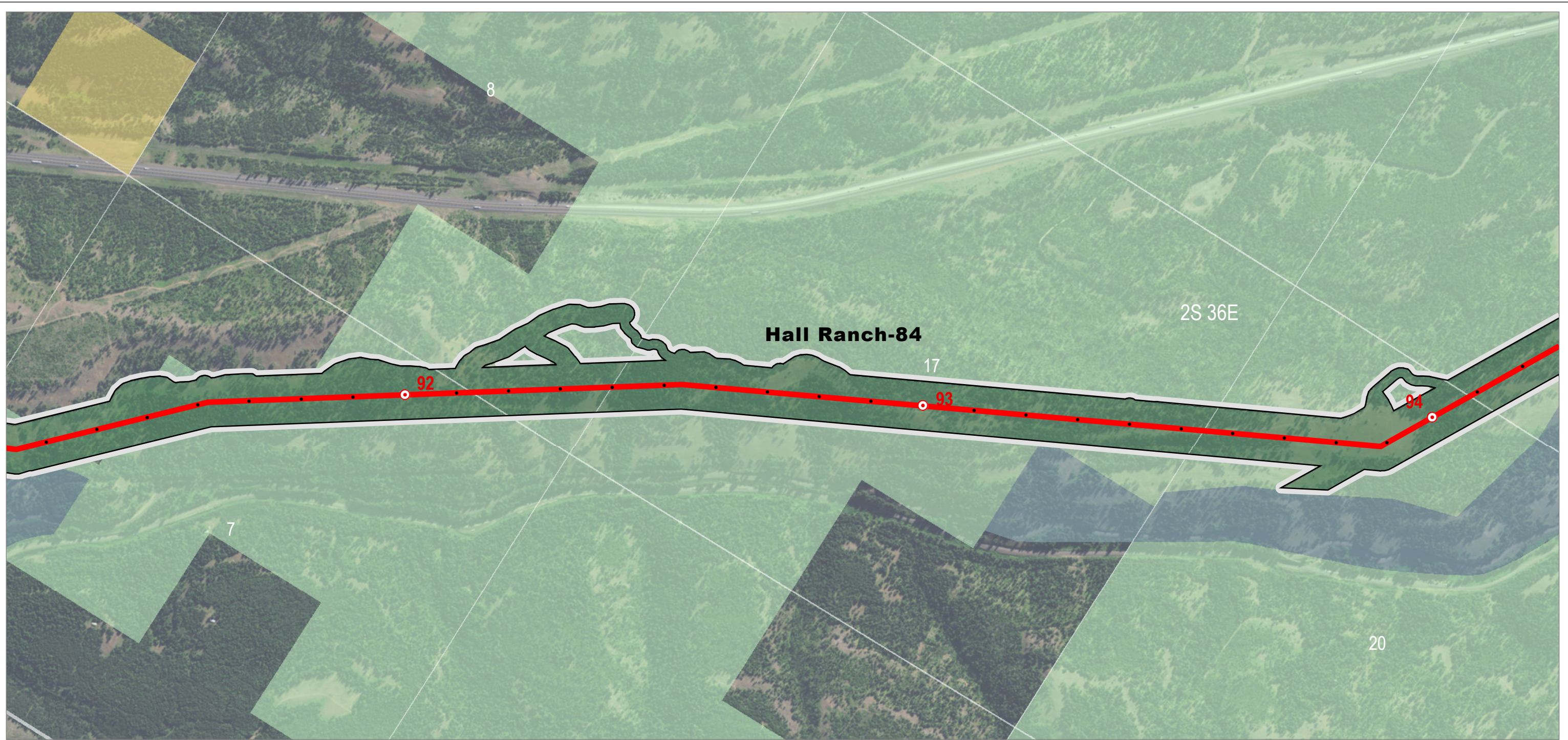
Proposed Route
Union County

Map 45

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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June 2017

Project Features

- Site Boundary
- Proposed Route
- Mileposts
 - Mile
 - Tenth-mile

STATSGO Soil Factors

- Hall Ranch

Land Status

- Bureau of Land Management
- Forest Service
- Private
- State or Local Parks and Recreation or Wildlife

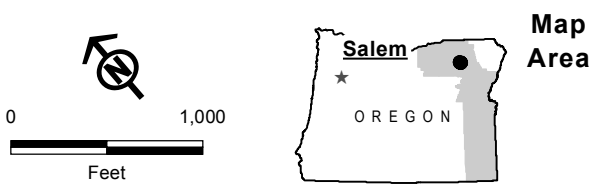
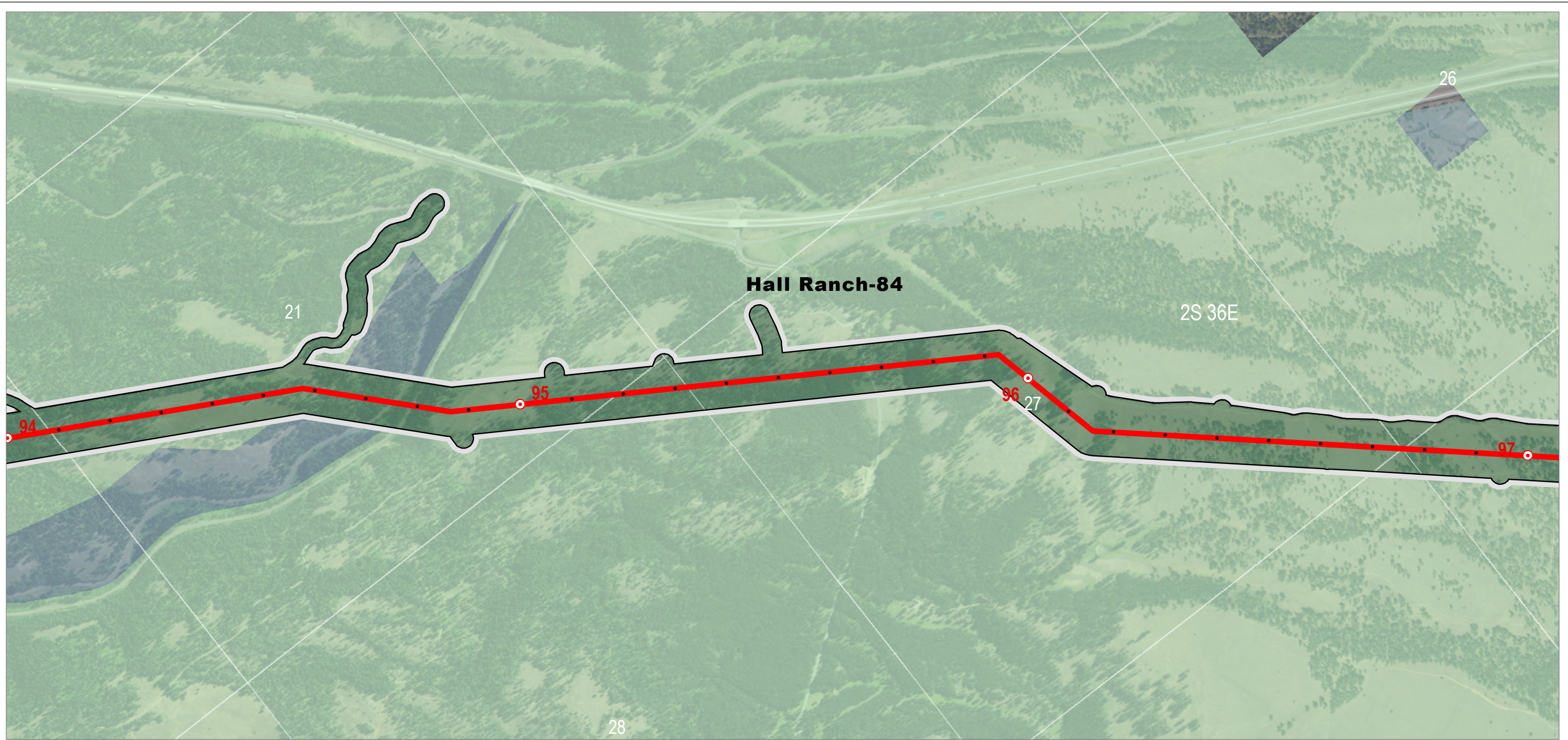


Boardman to Hemingway
Transmission Line Project

**Attachment I-1
Soil Mapping Units**

Proposed Route
Union County

Map 46



- | | | |
|--|---|--|
| <p>Project Features</p> <ul style="list-style-type: none"> Site Boundary Proposed Route <p>Mileposts</p> <ul style="list-style-type: none"> Mile Tenth-mile | <p>STATSGO Soil Factors</p> <ul style="list-style-type: none"> Hall Ranch | <p>Land Status</p> <ul style="list-style-type: none"> Forest Service Private State or Local Parks and Recreation or Wildlife |
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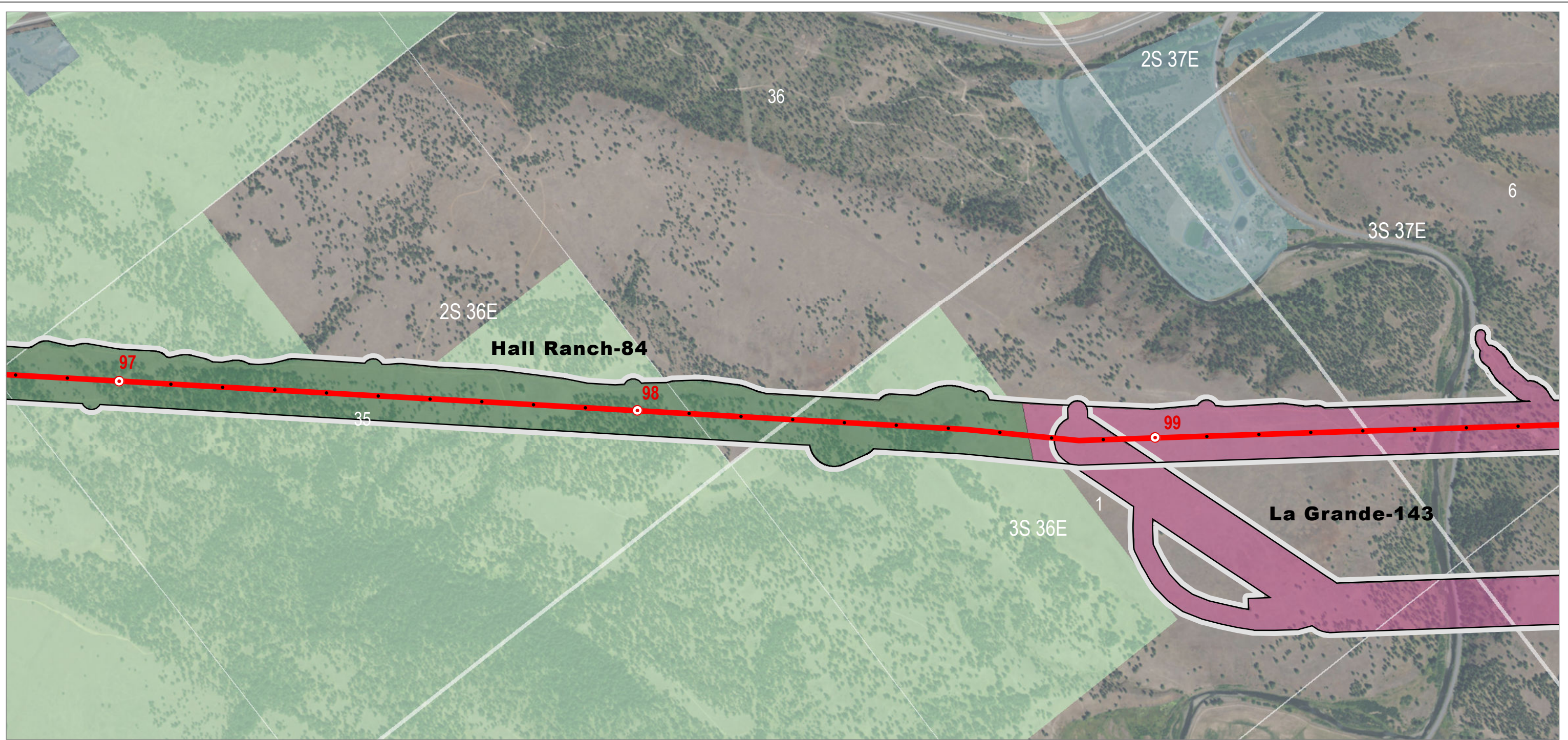
**Attachment I-1
Soil Mapping Units**

Proposed Route
Union County

Map 47

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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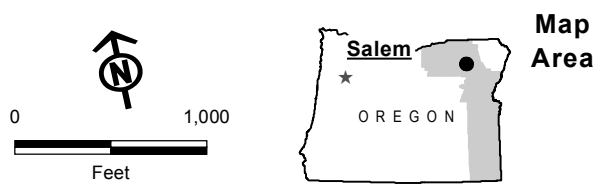
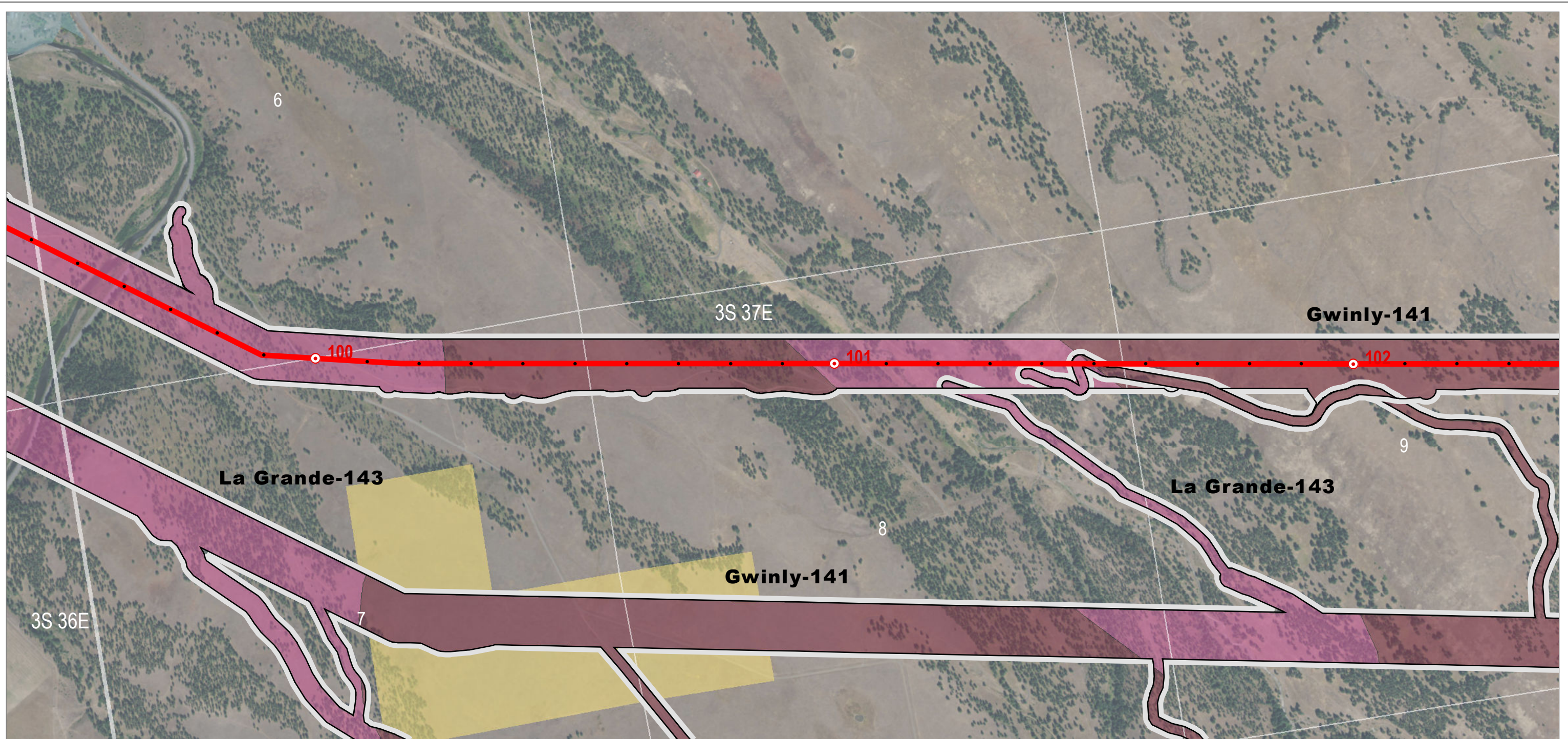


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|--|---|--|
| Project Features | STATSGO Soil Factors | Land Status |
| <ul style="list-style-type: none"> Site Boundary Proposed Route | <ul style="list-style-type: none"> Hall Ranch La Grande | <ul style="list-style-type: none"> Forest Service Private State or Local Parks and Recreation or Wildlife |
| Mileposts | | |
| <ul style="list-style-type: none"> Mile Tenth-mile | | |

**Attachment I-1
 Soil Mapping Units**

Proposed Route
 Union County

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo
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Project Features

- Site Boundary
- Proposed Route
- Mileposts**
- Mile
- Tenth-mile

STATSGO Soil Factors

- Gwinly
- La Grande

Land Status

- Bureau of Land Management
- Private
- State or Local Parks and Recreation or Wildlife



Boardman to Hemingway
Transmission Line Project

**Attachment I-1
Soil Mapping Units**

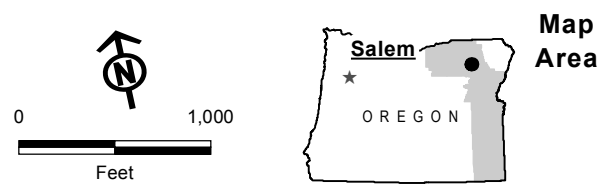
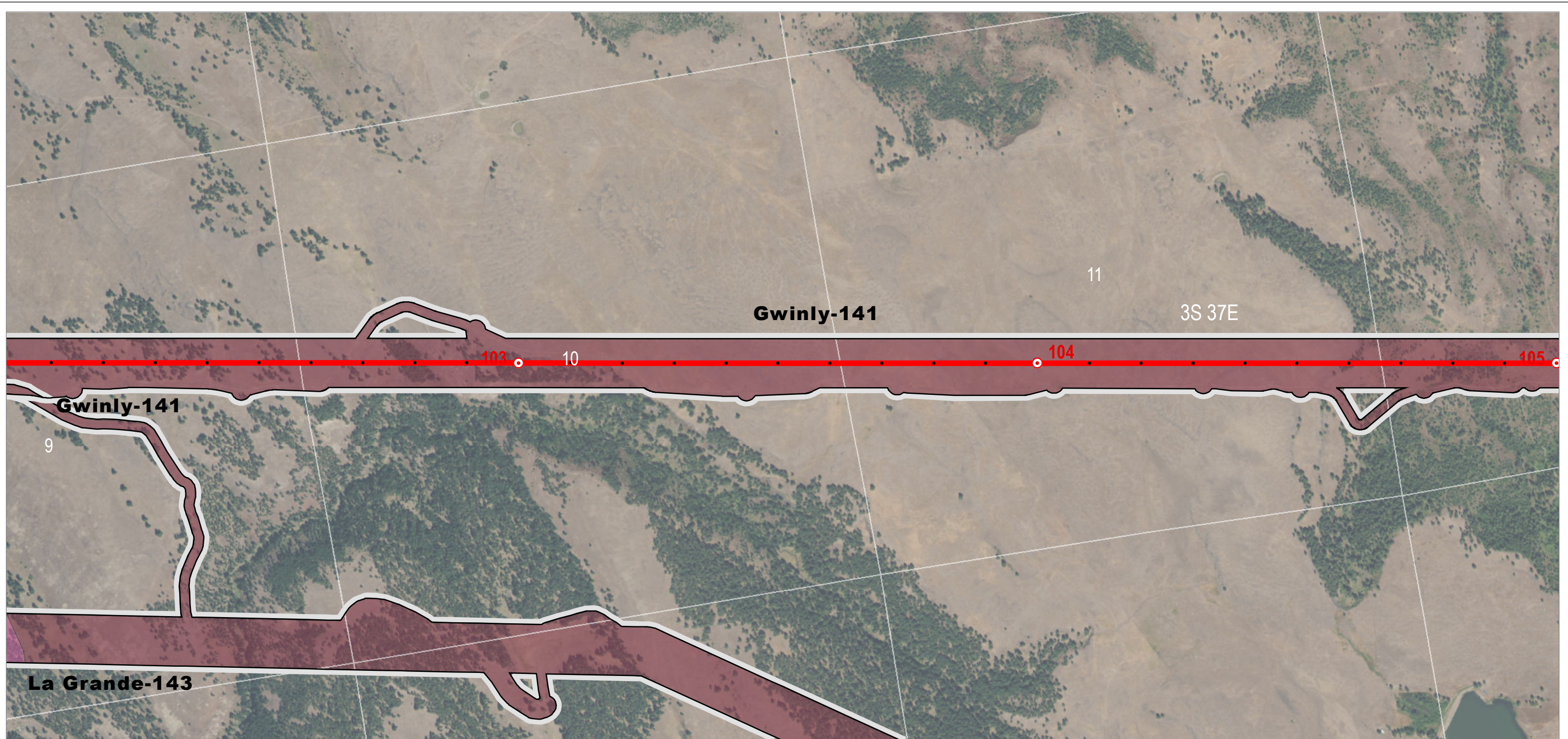
Proposed Route
Union County

Map 49

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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June 2017



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|-------------------------|-----------------------------|--------------------|
| Project Features | STATSGO Soil Factors | Land Status |
| □ Site Boundary | ■ Gwinly | □ Private |
| — Proposed Route | ■ La Grande | |
| Mileposts | | |
| ○ Mile | | |
| • Tenth-mile | | |

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**Attachment I-1
Soil Mapping Units**

Proposed Route
Union County

Map 50

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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June 2017



- Project Features**
- Site Boundary
 - Proposed Route
- Mileposts**
- Mile
 - Tenth-mile
- STATSGO Soil Factors**
- Gwinly
 - Hall Ranch
- Land Status**
- Private

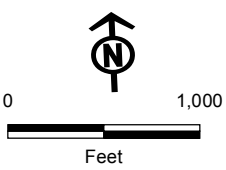
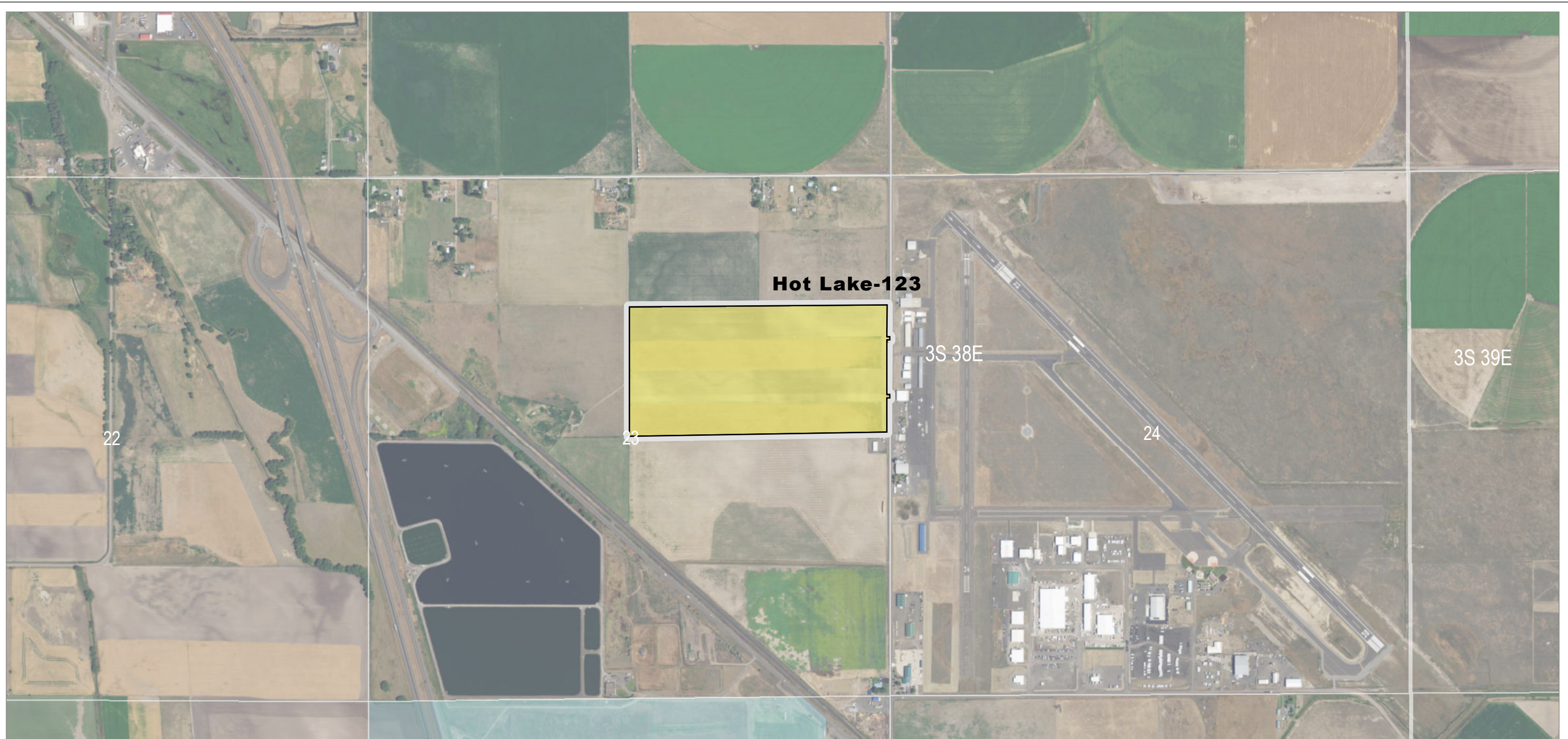
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**Attachment I-1
Soil Mapping Units**

Proposed Route
Union County

Map 51



Project Features
 [Black outline] Site Boundary

STATSGO Soil Factors
 [Yellow box] Hot Lake

Land Status
 [White box] Private
 [Light blue box] State or Local
 [Dark blue box] State or Local Parks and Recreation or Wildlife



Boardman to Hemingway
 Transmission Line Project

**Attachment I-1
 Soil Mapping Units**

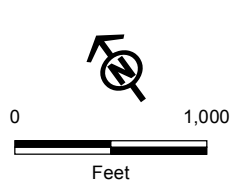
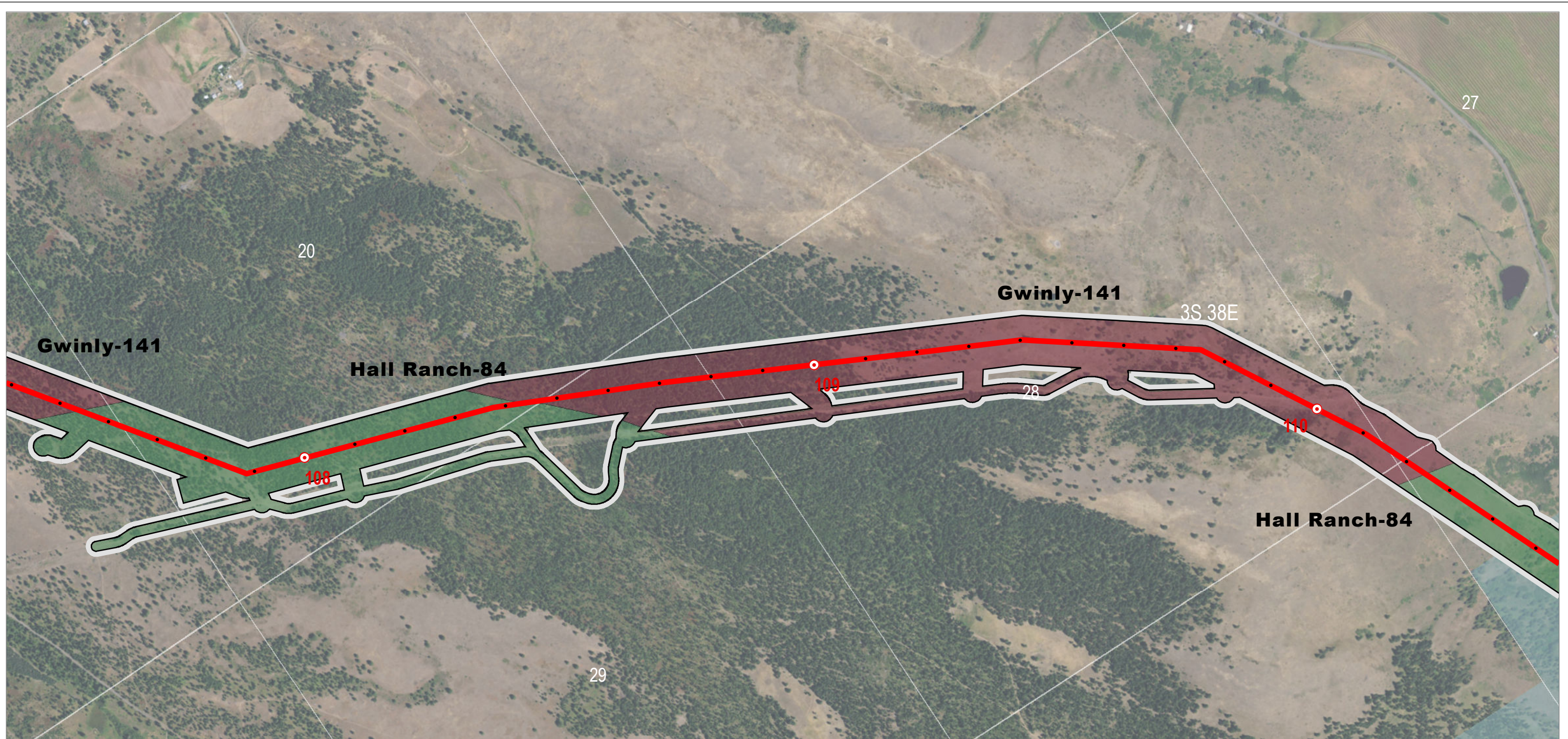
Proposed Route
 Union County

Map 52

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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Project Features

- Site Boundary
- Proposed Route

Mileposts

- Mile
- Tenth-mile

STATSGO Soil Factors

- Gwinly
- Hall Ranch

Land Status

- Private
- State or Local Parks and Recreation or Wildlife



Boardman to Hemingway
Transmission Line Project

**Attachment I-1
Soil Mapping Units**

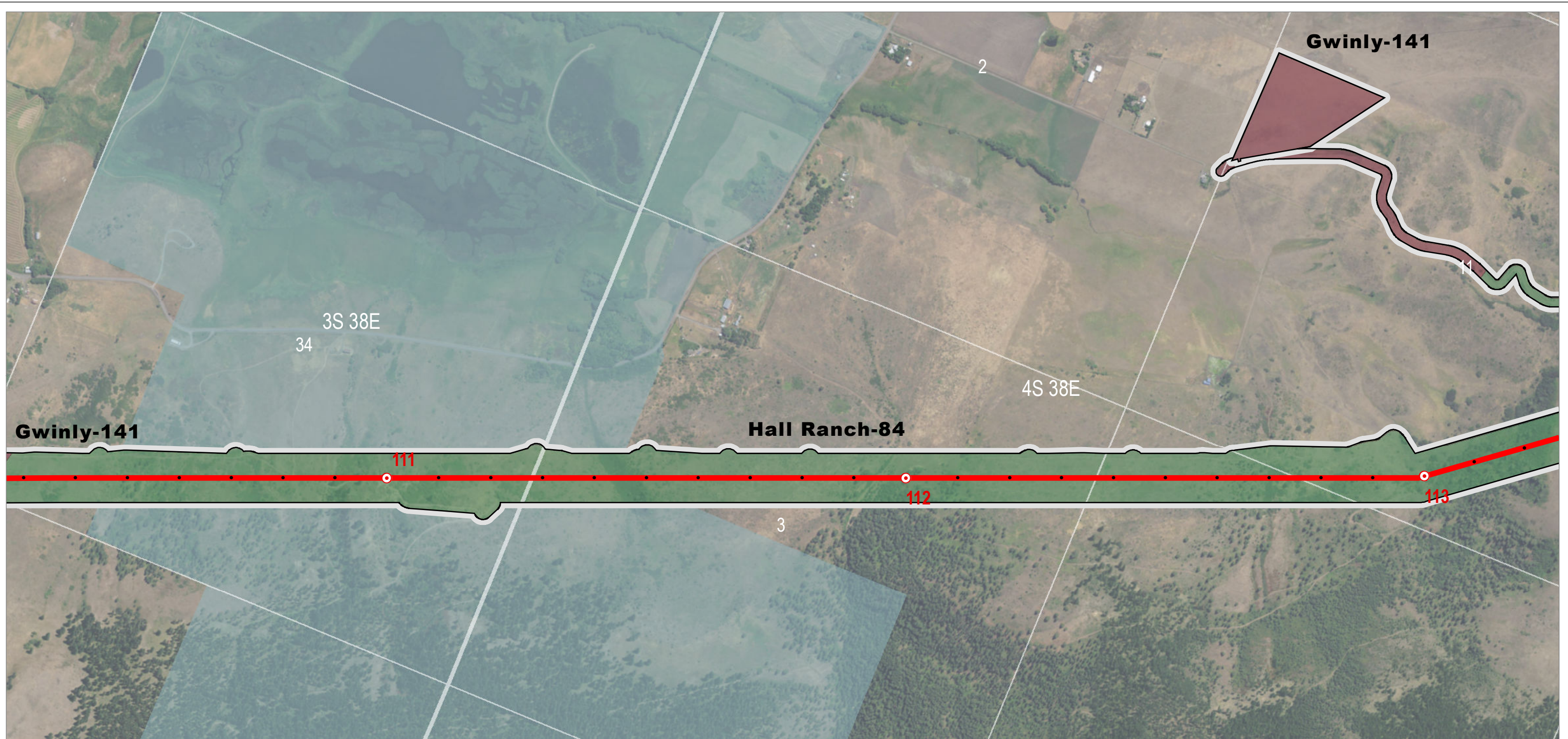
Proposed Route
Union County

Map 53

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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|--|--|--|
| Project Features | STATSGO Soil Factors | Land Status |
| <ul style="list-style-type: none"> Site Boundary Proposed Route | <ul style="list-style-type: none"> Gwinly Hall Ranch | <ul style="list-style-type: none"> Private State or Local Parks and Recreation or Wildlife |
| Mileposts | | |
| <ul style="list-style-type: none"> Mile Tenth-mile | | |

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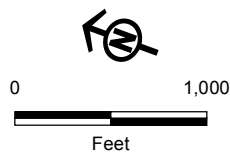
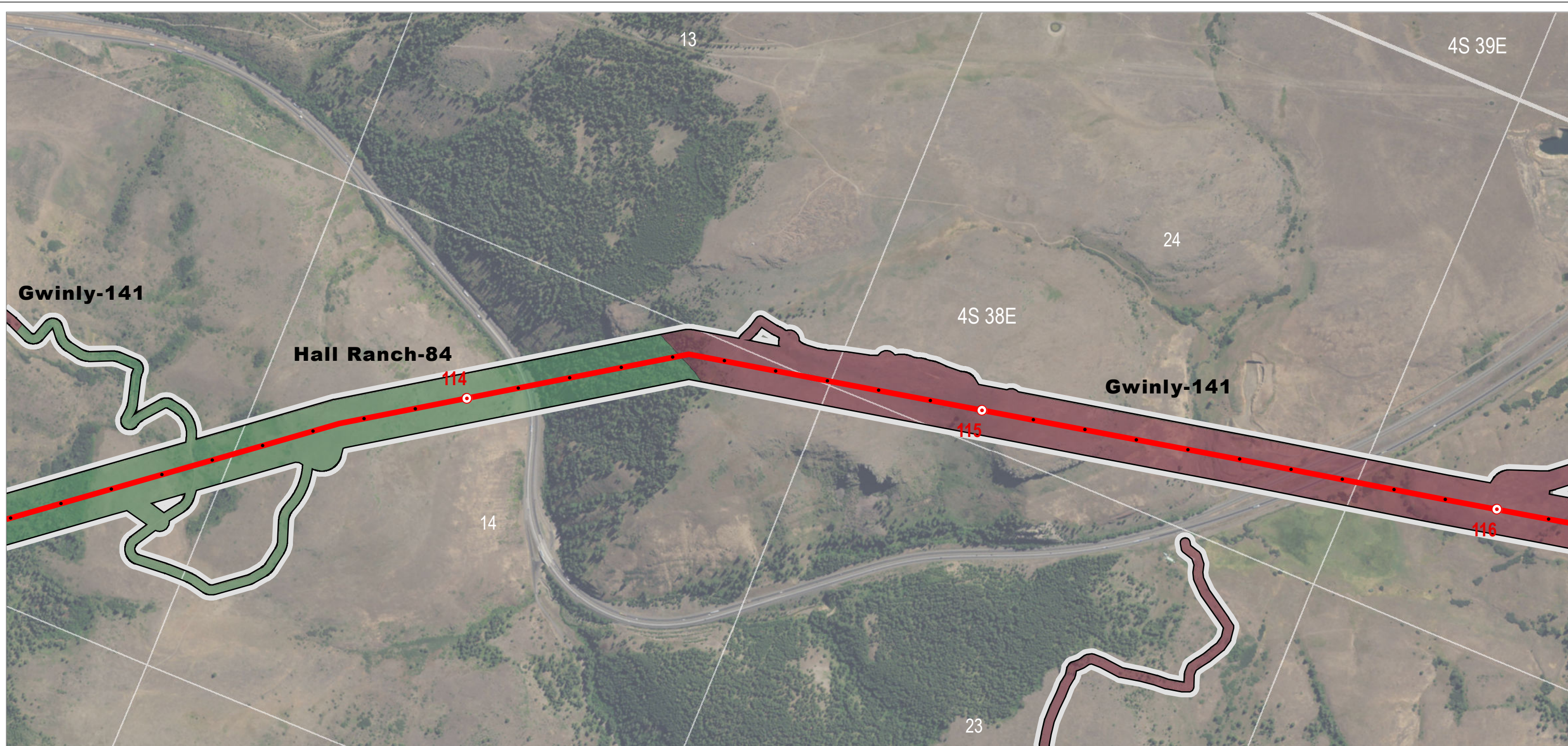
**Attachment I-1
Soil Mapping Units**

Proposed Route
Union County

Map 54

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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Project Features

- Site Boundary
- Proposed Route

Mileposts

- Mile
- Tenth-mile

STATSGO Soil Factors

- Gwinly
- Hall Ranch

Land Status

- Private



Boardman to Hemingway
Transmission Line Project

**Attachment I-1
Soil Mapping Units**

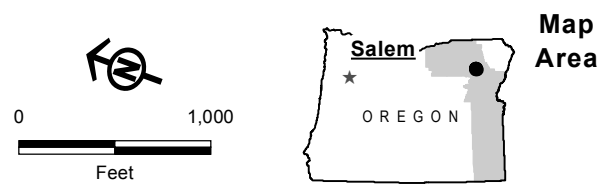
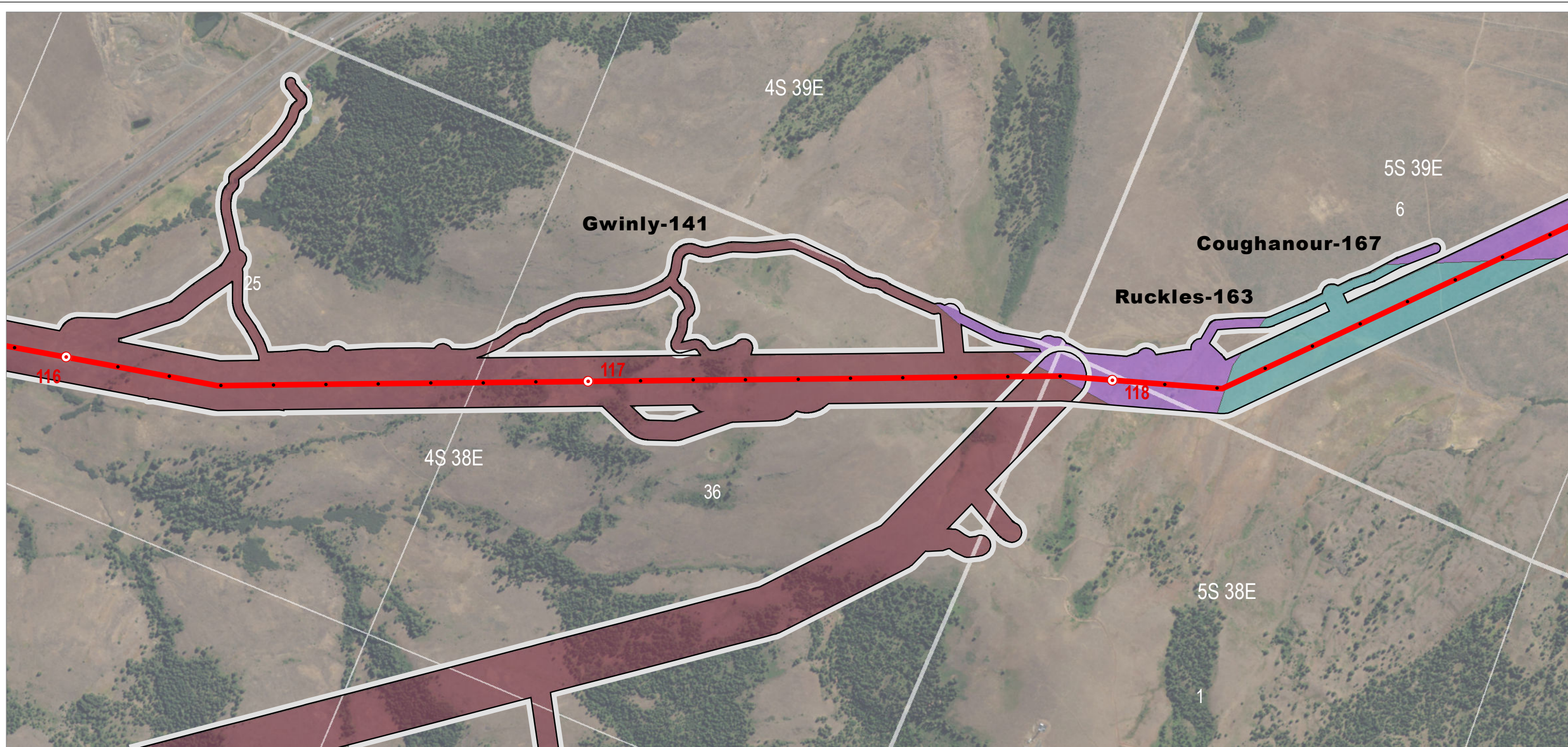
Proposed Route
Union County

Map 55

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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|--|--|---|
| Project Features | STATSGO Soil Factors | Land Status |
| <ul style="list-style-type: none"> Site Boundary Proposed Route | <ul style="list-style-type: none"> Coughanour Gwinly Ruckles | <ul style="list-style-type: none"> Private |
| Mileposts | | |
| <ul style="list-style-type: none"> Mile Tenth-mile | | |

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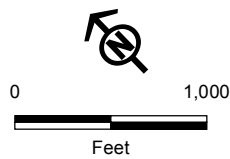
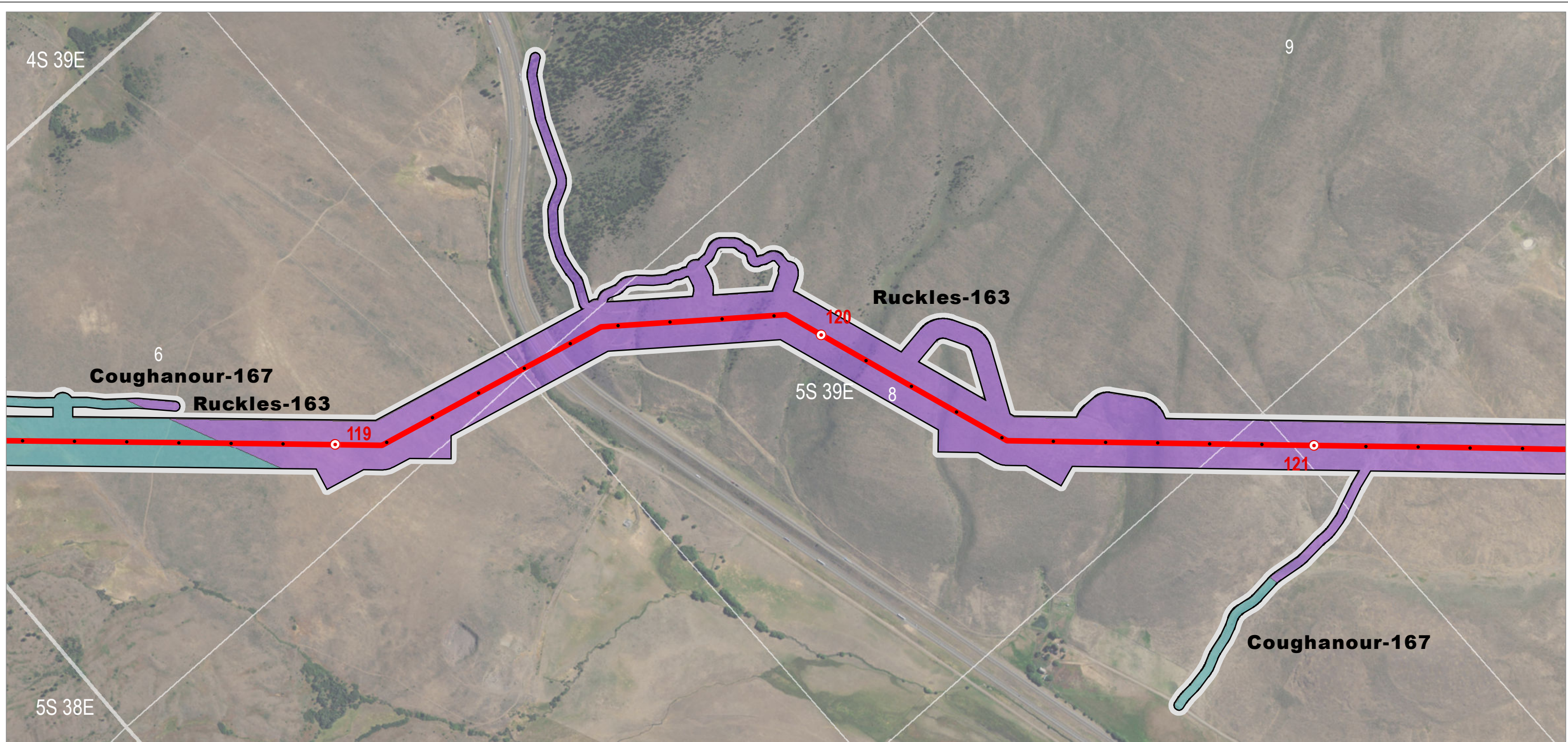
**Attachment I-1
Soil Mapping Units**

Proposed Route
Union County

Map 56

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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Project Features

- Site Boundary
- Proposed Route

Mileposts

- Mile
- Tenth-mile

STATSGO Soil Factors

- Coughanour
- Ruckles

Land Status

- Private



Boardman to Hemingway
Transmission Line Project

**Attachment I-1
Soil Mapping Units**

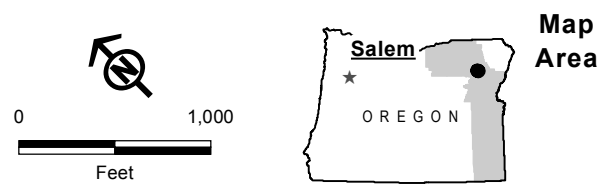
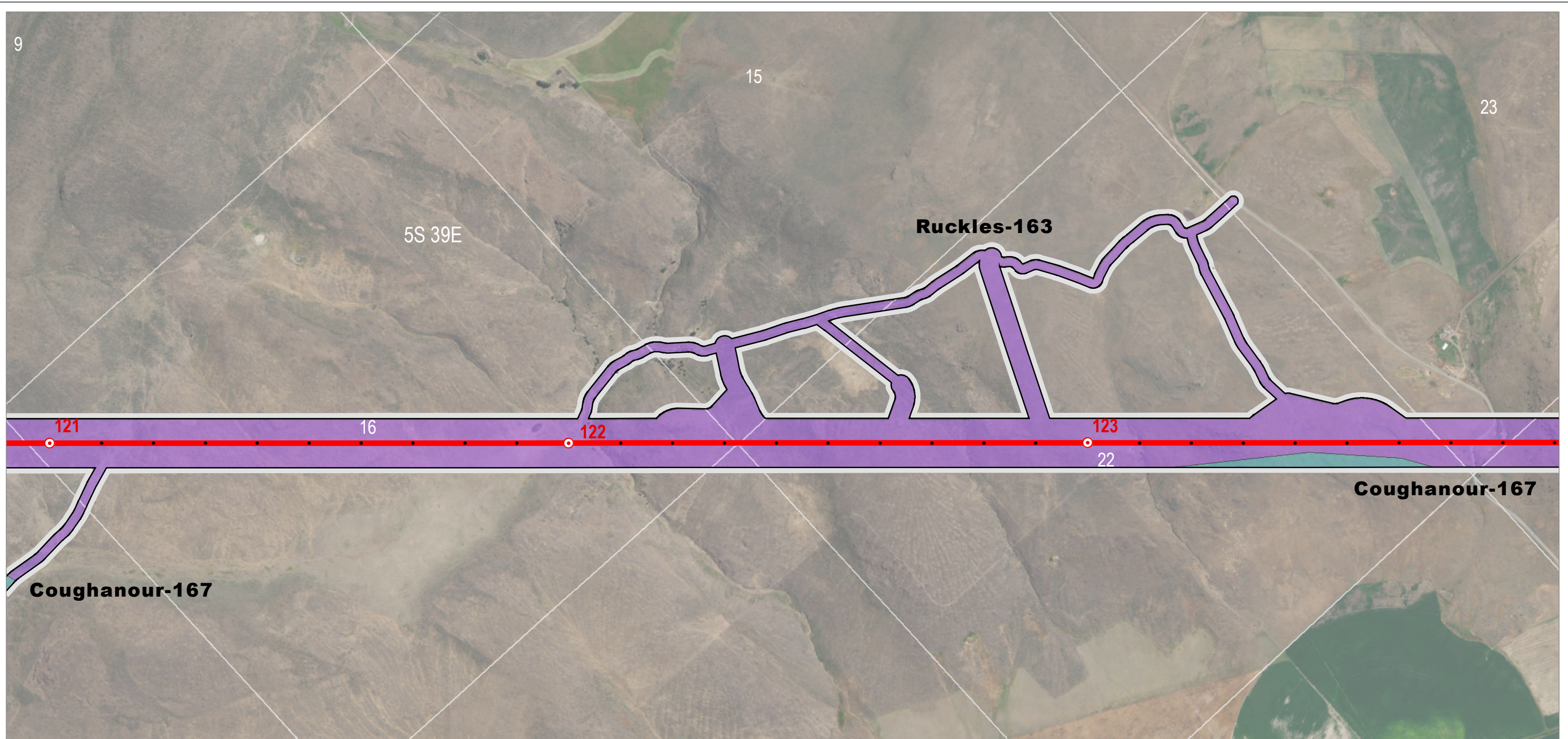
Proposed Route
Union County

Map 57

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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|---|---|--|
| Project Features | STATSGO Soil Factors | Land Status |
| <ul style="list-style-type: none"> Site Boundary Proposed Route | <ul style="list-style-type: none"> Coughanour Ruckles | <ul style="list-style-type: none"> Private |
| Mileposts | | |
| <ul style="list-style-type: none"> Mile Tenth-mile | | |

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**Attachment I-1
Soil Mapping Units**

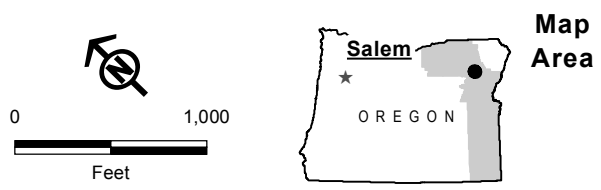
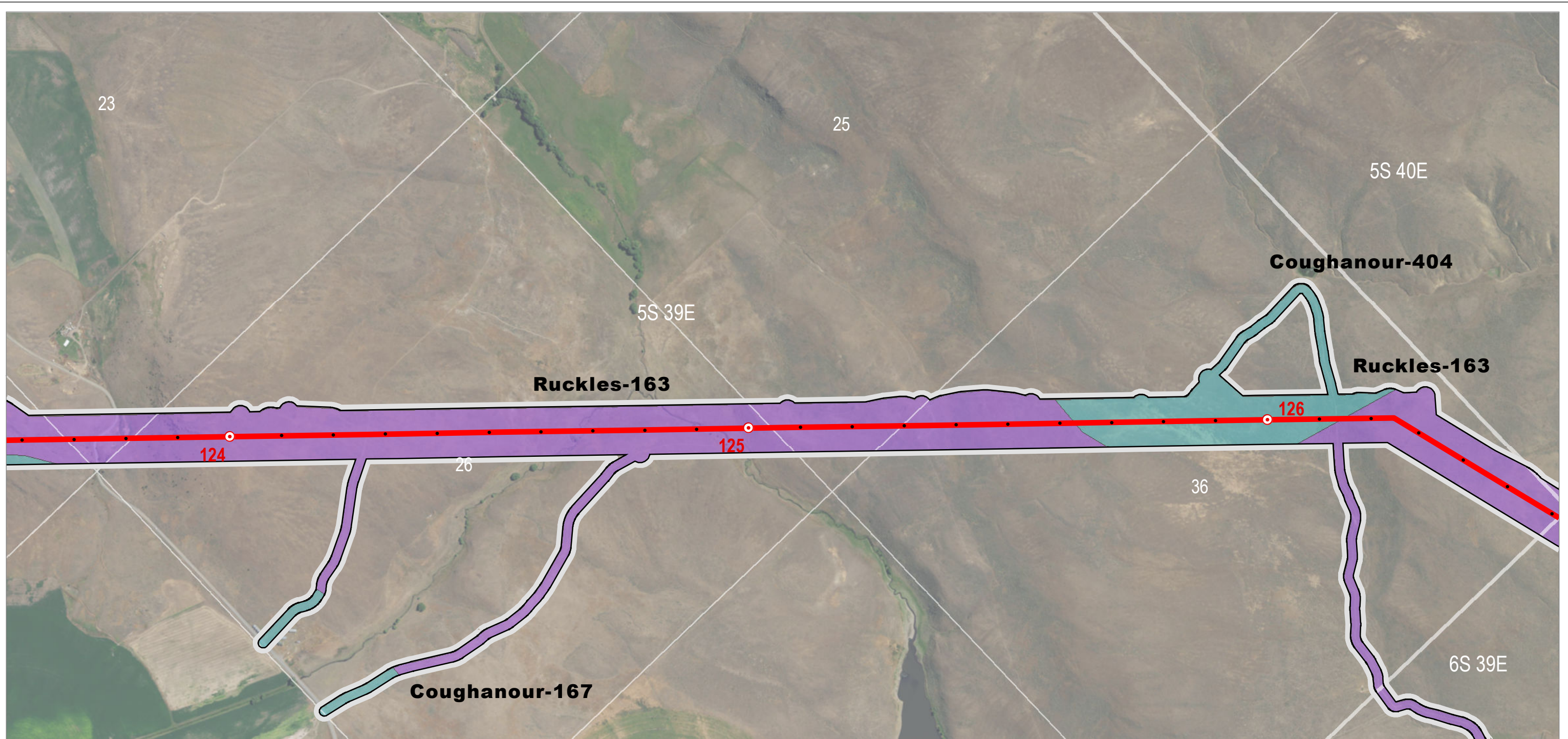
Proposed Route
Union County

Map 58

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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|---|---|---|
| Project Features | STATSGO Soil Factors | Land Status |
| <ul style="list-style-type: none"> □ Site Boundary — Proposed Route | <ul style="list-style-type: none"> ■ Coughanour ■ Ruckles | <ul style="list-style-type: none"> □ Private |
| Mileposts | | |
| <ul style="list-style-type: none"> ○ Mile • Tenth-mile | | |

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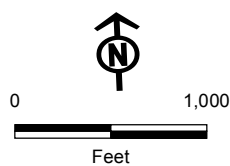
**Attachment I-1
Soil Mapping Units**

Proposed Route
Union County

Map 59

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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Project Features

- Site Boundary
- Proposed Route

Mileposts

- Mile
- Tenth-mile

STATSGO Soil Factors

- Coughanour
- Ruckles

Land Status

- Private



Boardman to Hemingway
Transmission Line Project

**Attachment I-1
Soil Mapping Units**

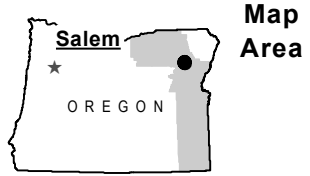
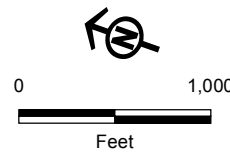
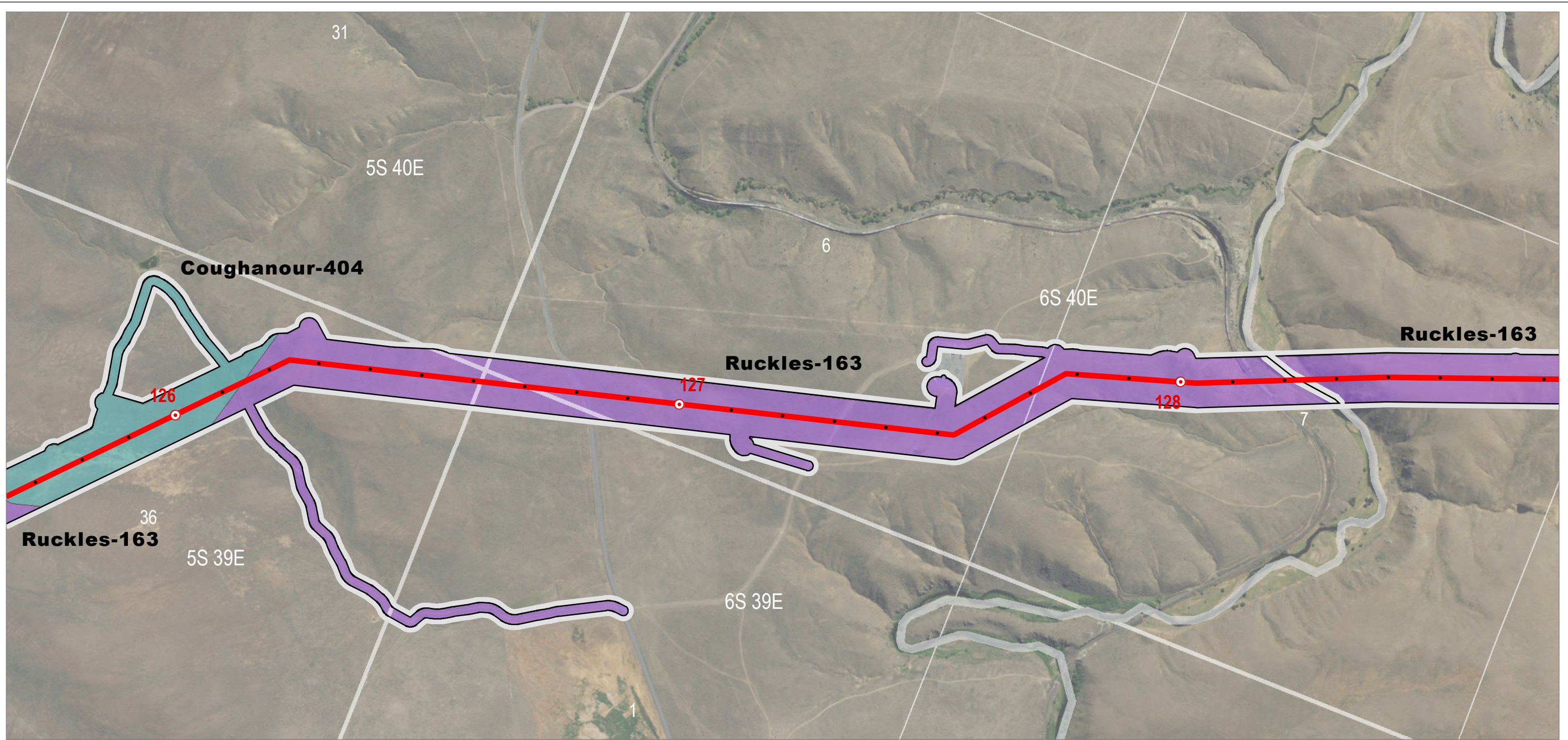
Proposed Route
Union County

Map 60

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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June 2017



- Project Features**
- Site Boundary
 - Proposed Route
- Mileposts**
- Mile
 - Tenth-mile

- STATSGO Soil Factors**
- Coughanour
 - Ruckles

- Land Status**
- Private

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Transmission Line Project

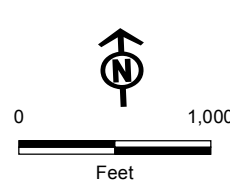
**Attachment I-1
Soil Mapping Units**

Proposed Route
Union County

Map 61

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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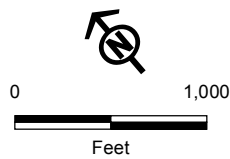
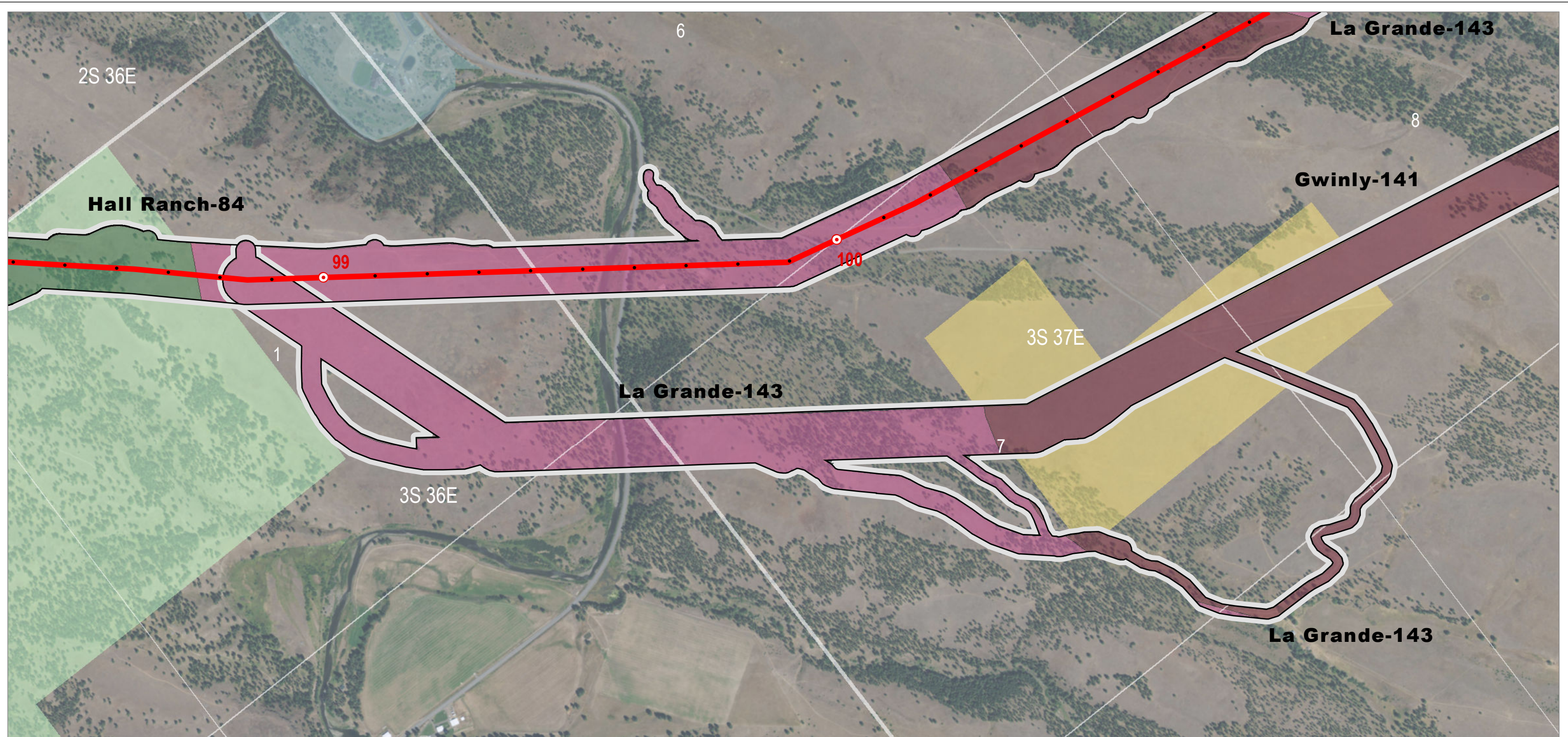
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|-------------------------|-----------------------------|--------------------|
| Project Features | STATSGO Soil Factors | Land Status |
| Site Boundary | Coughanour | Private |
| | Wingville | |

**Attachment I-1
Soil Mapping Units**

Proposed Route
Union County

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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June 2017

Project Features

- Site Boundary
- Proposed Route
- Mileposts**
- Mile
- Tenth-mile

STATSGO Soil Factors

- Gwinly
- Hall Ranch
- La Grande

Land Status

- Bureau of Land Management
- Forest Service
- Private
- State or Local Parks and Recreation or Wildlife

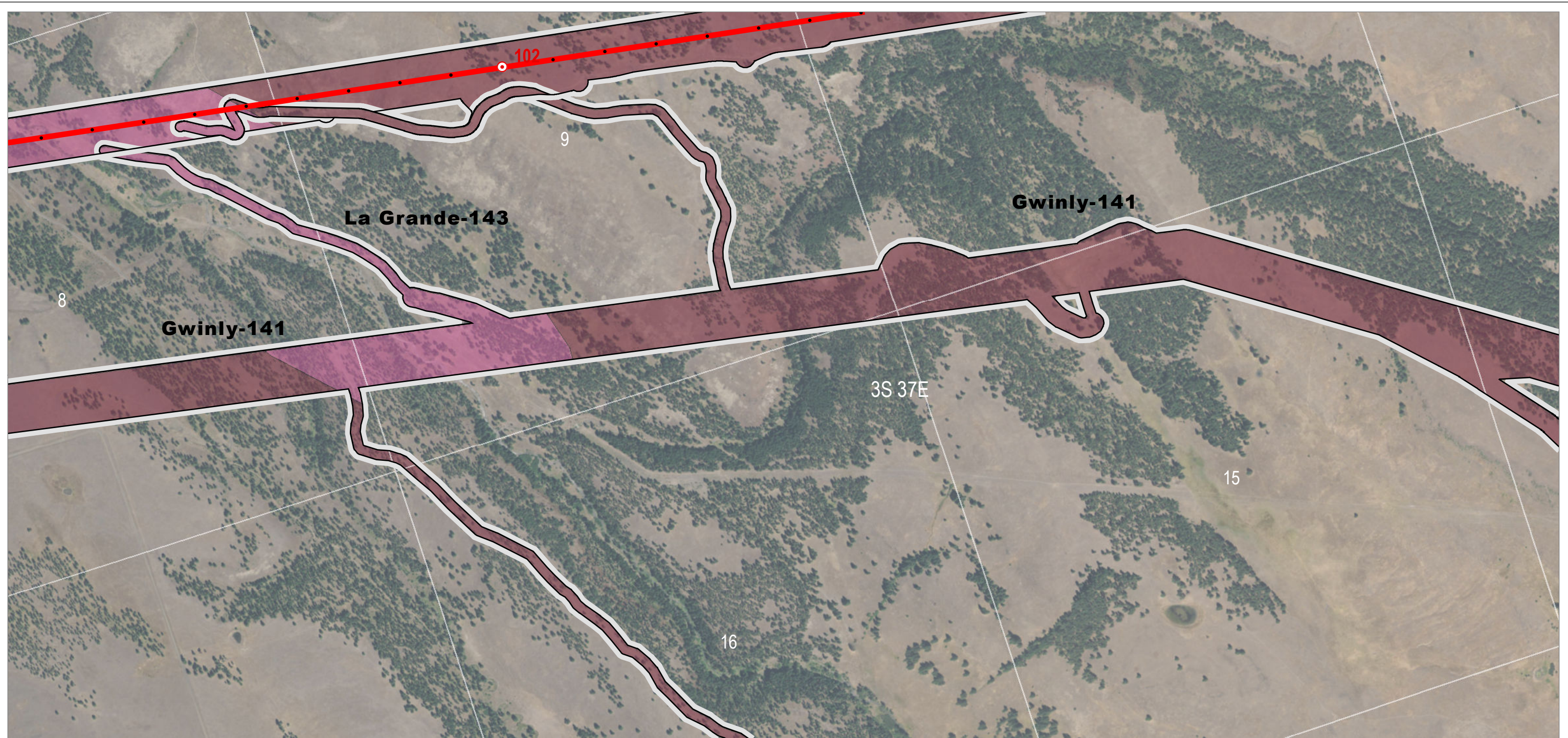


Boardman to Hemingway
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**Attachment I-1
Soil Mapping Units**

Morgan Lake Alternative
Union County

Map 126

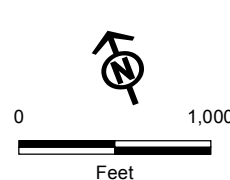


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|---|---|--|
| Project Features | STATSGO Soil Factors | Land Status |
| <ul style="list-style-type: none"> Site Boundary Proposed Route | <ul style="list-style-type: none"> Gwinly La Grande | <ul style="list-style-type: none"> Private |
| Mileposts | | |
| <ul style="list-style-type: none"> Mile Tenth-mile | | |

**Attachment I-1
Soil Mapping Units**

Morgan Lake Alternative
Union County

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo
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June 2017



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| <u>Project Features</u> | <u>STATSGO Soil Factors</u> | <u>Land Status</u> |
| □ Site Boundary | ■ Gwinly | □ Private |

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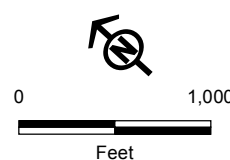
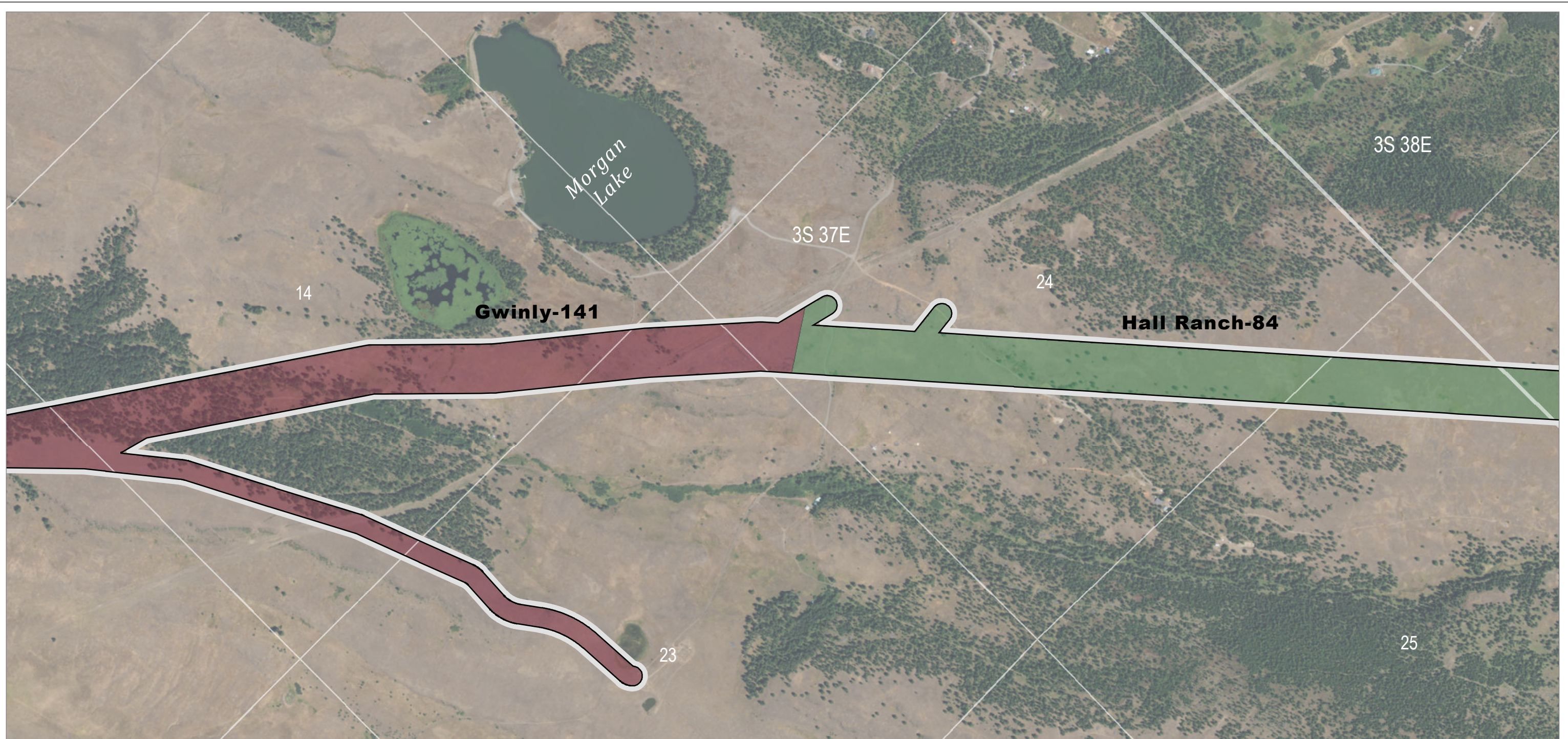
**Attachment I-1
Soil Mapping Units**

Morgan Lake Alternative
Union County

Map 128

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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|-------------------------|-----------------------------|--------------------|
| Project Features | STATSGO Soil Factors | Land Status |
| Site Boundary | Gwinly | Private |
| | Hall Ranch | |

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Boardman to Hemingway
Transmission Line Project

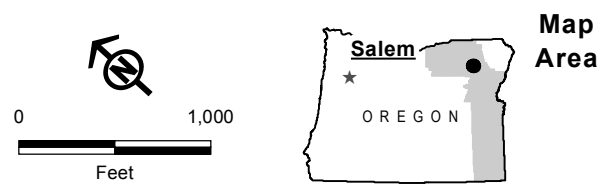
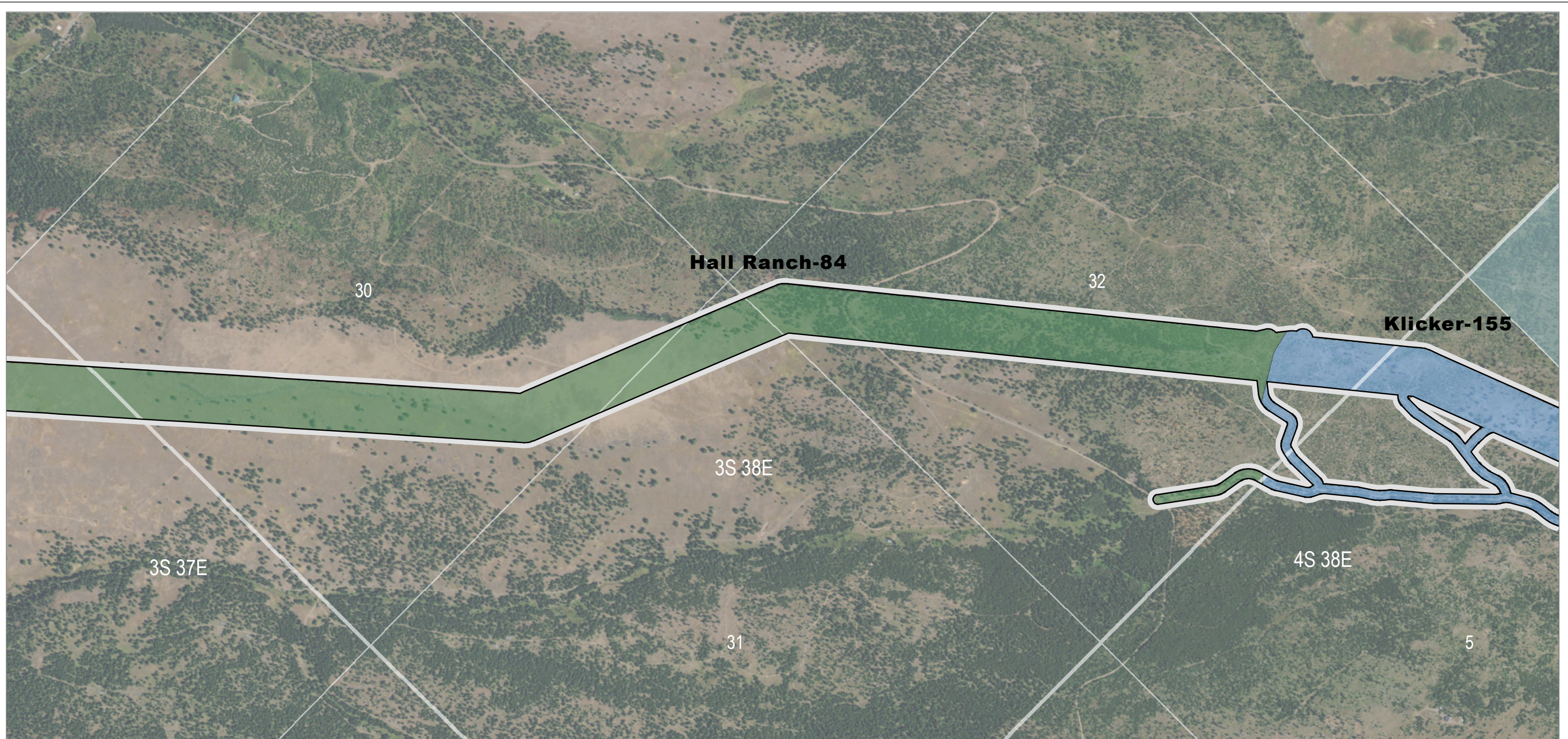
**Attachment I-1
Soil Mapping Units**

Morgan Lake Alternative
Union County

Map 129

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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IDAHO POWER
An IDACORP Company

Boardman to Hemingway
Transmission Line Project

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|-------------------------|-----------------------------|---|
| Project Features | STATSGO Soil Factors | Land Status |
| Site Boundary | Hall Ranch | Private |
| | Klicker | State or Local Parks and Recreation or Wildlife |

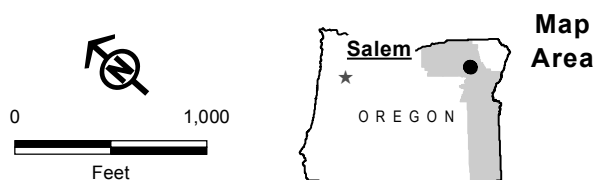
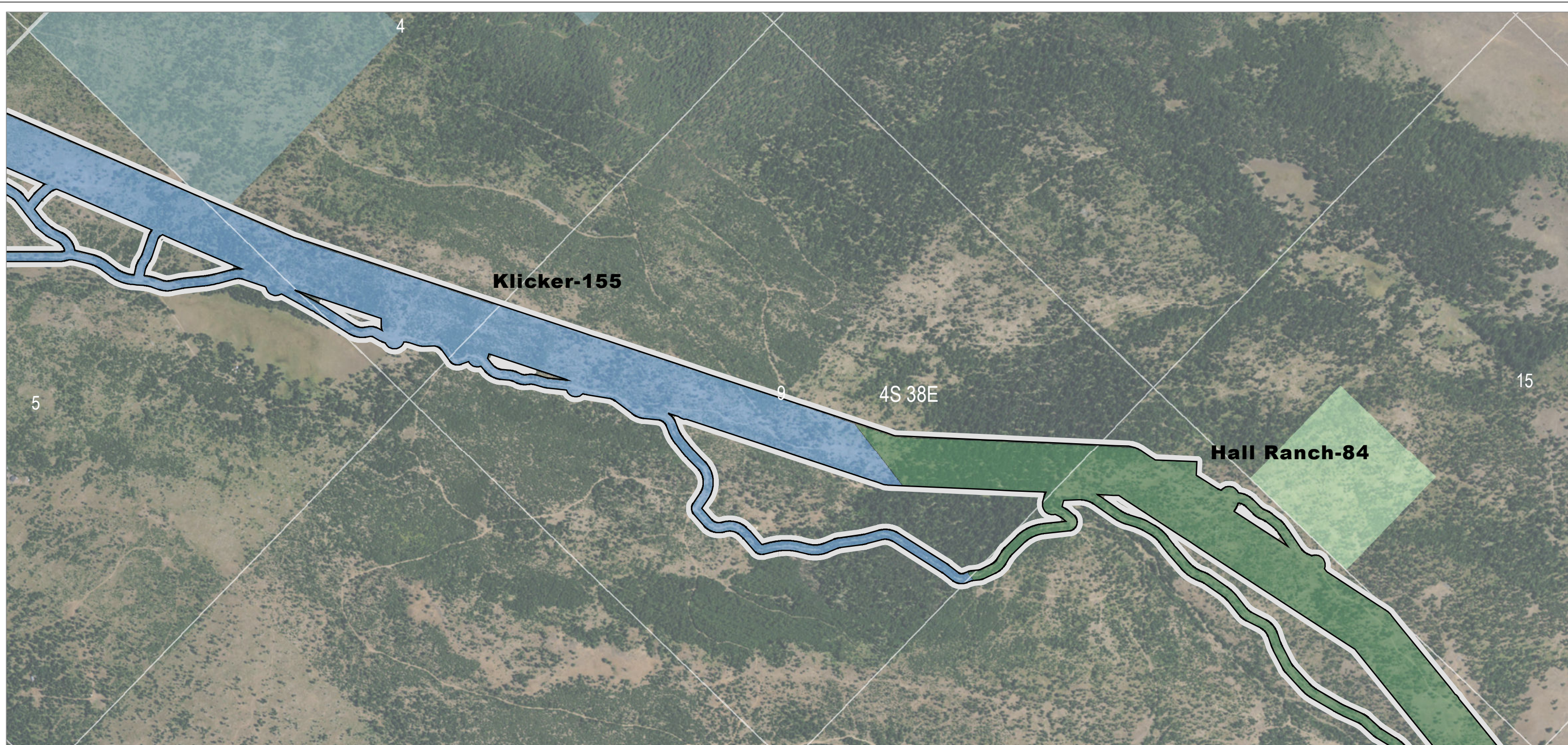
**Attachment I-1
Soil Mapping Units**

Morgan Lake Alternative
Union County

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June 2017



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| Project Features | STATSGO Soil Factors | Land Status |
| Site Boundary | Hall Ranch | Forest Service |
| | Klicker | Private |
| | | State or Local Parks and Recreation or Wildlife |

IDAHO POWER
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Boardman to Hemingway
Transmission Line Project

**Attachment I-1
Soil Mapping Units**

Morgan Lake Alternative
Union County

Map 131

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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|-------------------------|-----------------------------|--------------------|
| Project Features | STATSGO Soil Factors | Land Status |
| Site Boundary | Gwinly | Forest Service |
| Proposed Route | Hall Ranch | Private |
| Mileposts | | |
| Tenth-mile | | |

IDAHO POWER
An IDACORP Company

Boardman to Hemingway
Transmission Line Project

**Attachment I-1
Soil Mapping Units**

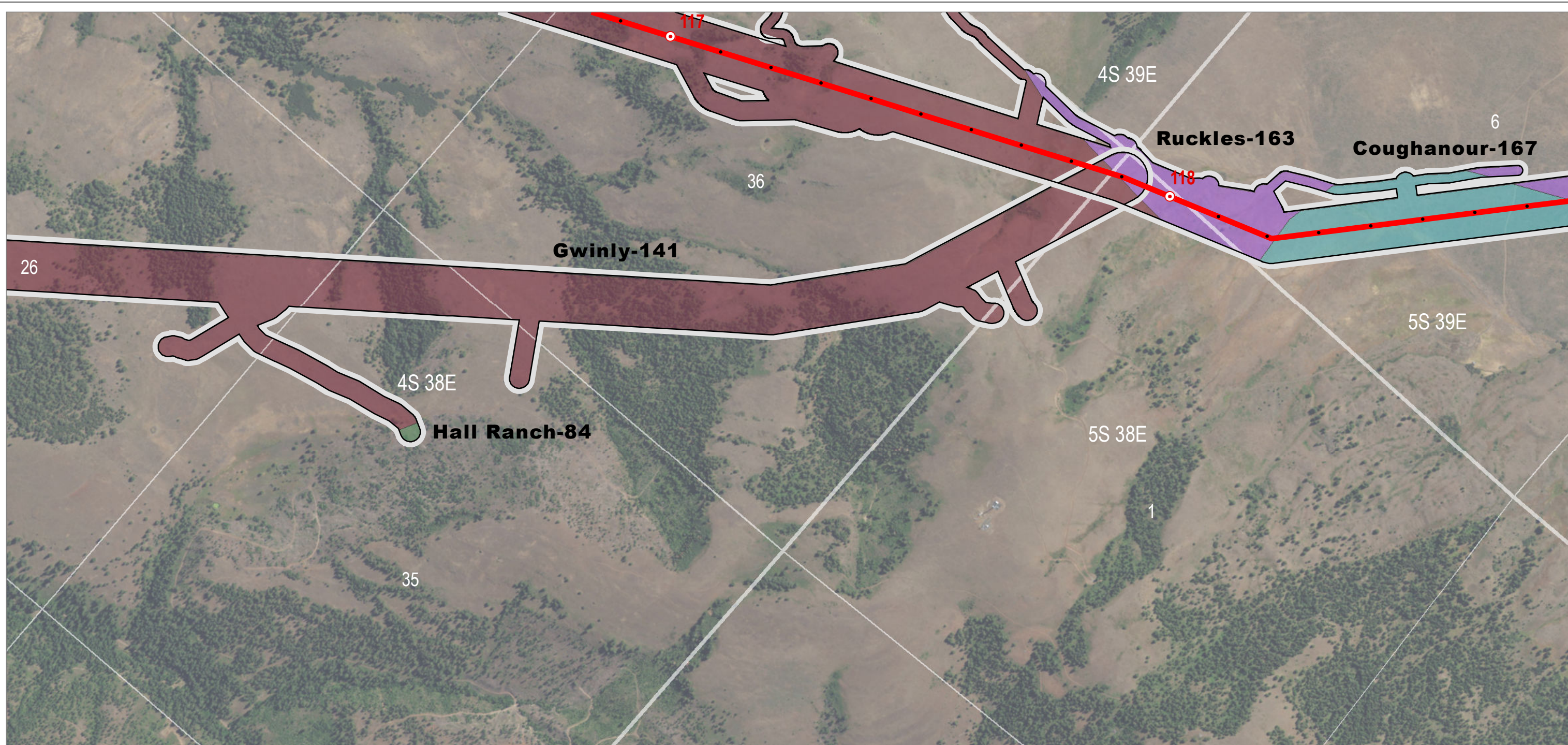
Morgan Lake Alternative
Union County

Map 132

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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June 2017



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|---|---|--|
| Project Features | STATSGO Soil Factors | Land Status |
| <ul style="list-style-type: none"> Site Boundary Proposed Route | <ul style="list-style-type: none"> Coughanour Gwinly Hall Ranch Ruckles | <ul style="list-style-type: none"> Private |
| Mileposts | | |
| <ul style="list-style-type: none"> Mile Tenth-mile | | |

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Boardman to Hemingway
Transmission Line Project

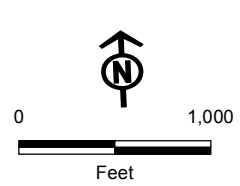
**Attachment I-1
Soil Mapping Units**

Morgan Lake Alternative
Union County

Map 133

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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Project Features
 [Symbol] Site Boundary

STATSGO Soil Factors
 [Symbol] Hot Lake

Land Status
 [Symbol] Private
 [Symbol] State or Local
 [Symbol] State or Local Parks and Recreation or Wildlife

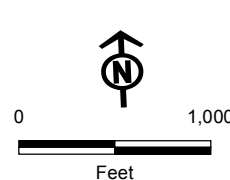
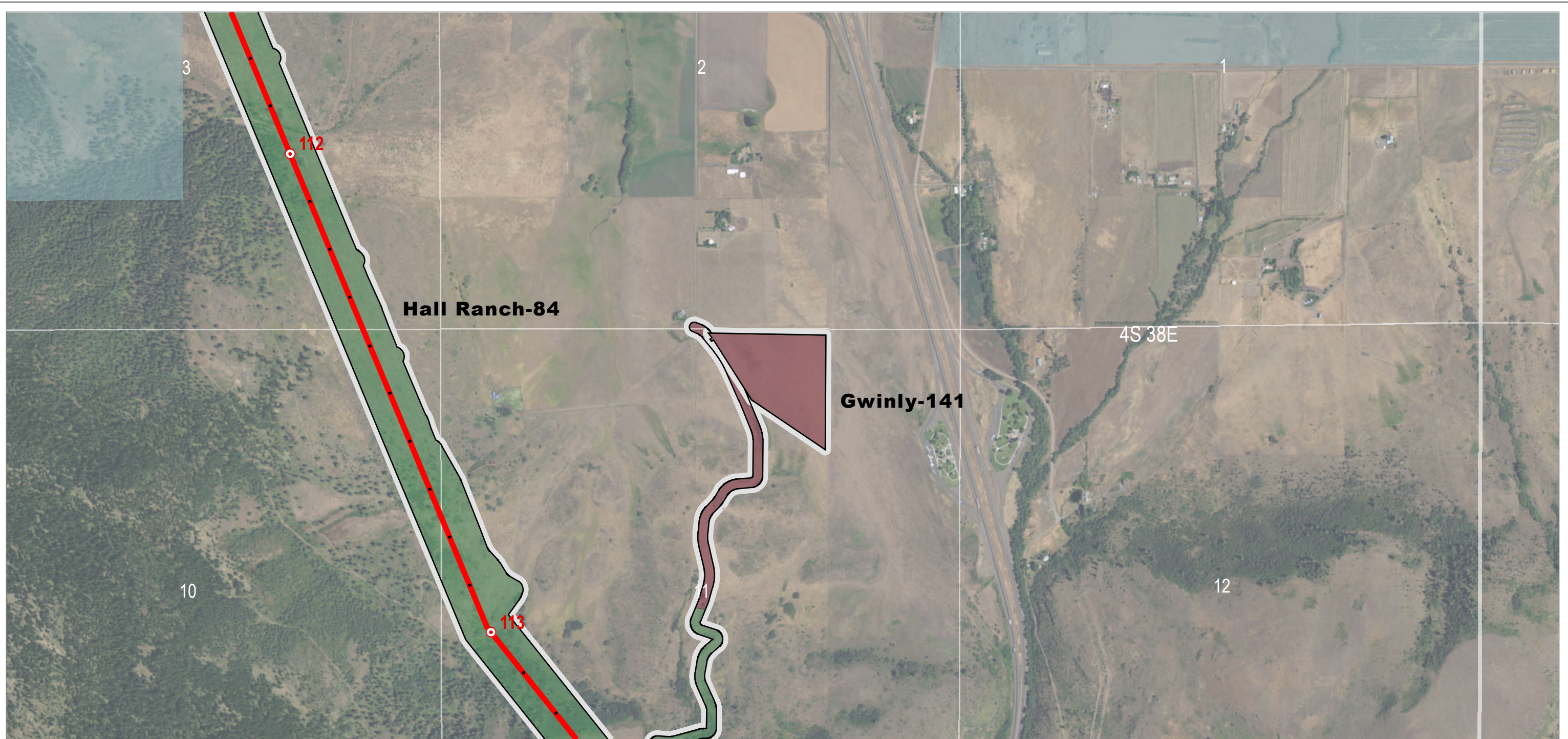
IDAHO POWER Boardman to Hemingway
 An IDACORP Company Transmission Line Project

**Attachment I-1
 Soil Mapping Units**

Morgan Lake Alternative
 Union County

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|-------------------------|-----------------------------|---|
| Project Features | STATSGO Soil Factors | Land Status |
| □ Site Boundary | ■ Gwinly | □ Private |
| — Proposed Route | ■ Hall Ranch | ■ State or Local Parks and Recreation or Wildlife |
| Mileposts | | |
| ○ Mile | | |
| • Tenth-mile | | |

**Attachment I-1
Soil Mapping Units**

Morgan Lake Alternative
Union County

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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