APPENDIX I: WETLAND AND OTHER WATERS DELINEATION REPORT (REVISED AUGUST 2021)

TETRA TECH

Memo

To:	Amy Moon, EFSEC; Lori White, Ecology
Cc:	Dave Kobus, Scout Clean Energy
From:	Jessica Taylor, Tetra Tech; Linnea Fossum, Tetra Tech
Date:	Thursday, August 12, 2021
Subject:	Amendments to the Wetlands and Other Waters Delineation Report for the Horse Heaven Wind Farm Project

This memo serves as a cover sheet to the amended Wetlands and Other Waters Delineation Report for the Horse Heaven Wind Farm Project and details the changes that have been made as a result of surveys completed in May 2021 where access had not previously been granted. The Washington Department of Ecology requested that the report be amended to include wetland E10, found outside the Project survey area, and the field delineated streamlines for the streams on Washington Department of Natural Resources land that had previously been inaccessible. The following table lists the amendments made to the original Wetlands and Other Waters Delineation Report for the Horse Heaven Wind Farm Project.

Item	Description	Page Number and Location
1	Added precipitation data for May 2021 site visit	Pages 4 and 5, Section 4.5 and Table 3
2	Added dates of surveys to Section 5.2 Field Work	Page 6, Section 5.2
3	Added wetland "E10" descriptions to Section 6, Figure A-4, and data sheets in Appendix B.	Page 7, Section 6.1; Figure A-4 Map 11; Appendix B
4	Ephemeral drainages EPH900, EPH901, EPH902, EPH904, and EPH905 were originally digitized using orthoimagery due to lack of access to those parcels. These features were surveyed in the field in May when access to those parcels was obtained. The last paragraph in Section 5.2.2 detailing the desktop delineation method has been removed.	Page 7, Section 5.2.2
5	Desktop delineated streams EPH901 and EPH902 were found to not actually have bed or banks during field surveys. Both features were swale features. These features have been removed from the table of non-wetland features and figures.	Page 7, Table 4; Figure A-4, Maps 3 and 8
6	Figure A-4 has been updated to show field delineated streamlines for EPH900, EPH904, and EPH905.	EPH900 – Figure A-4, Map 8; EPH904, and EPH905 – Figure A-4, Map 11

Tetra Tech, Inc.
19803 North Creek Parkway, Bothell, WA 98011
Tel +425.482.7600 **Fax** +425.482.7652 | tetratech.com

Wetlands and Other Waters Delineation Report for the Horse Heaven Wind Farm Project

Submitted by
Horse Heaven Wind Farm, LLC

Prepared by



December 2020
Amended August 2021

CONTENTS

1 Introduction 1
2 Landscape Setting and Land Use 1
2.1 Project Study Area 1
2.2 Landscape Setting 1
2.3 National Wetlands Inventory and Natural Resources Conservation Service Soils 2
2.3.1 National Wetlands Inventory Data 2
2.3.2 NRCS Hydric Soils Data 2
3 Site Alterations 3
4 Precipitation Data and Analysis 3
4.1 February 2020 Site Visits 3
4.2 August 2020 Site Visits 4
4.3 October 2020 Site Visits 4
4.4 November 2020 Site Visit 4
4.5 May 2021 Site Visit 4
5 Methods 6
5.1 Pre-field Work 6
5.2 Field Work 6
5.2.1 Wetland Delineations 6
5.2.2 Non-wetland Waters Evaluations 6
6 Description of Wetlands and Other Waters 7
6.1 Wetlands 7
6.2 Non-Wetland Waters 7
7 Deviation from NWI 8
8 Mapping Methods 8
9 Results and Conclusions 8
10 References 8

LIST OF TABLES

Table 1. Soils Mapped in the Project Study Area[1] 2
Table 2. Precipitation Data – Water Year 2019 to 2020: Current and Historical (Inches) 5
Table 3. Precipitation Data – Water Year 2020 to 2021: Current and Historical (Inches) 5
Table 4. Non-wetland Waters 7

APPENDICES

Appendix A. Figures
Appendix B. USACE Data Sheets
Appendix C. Photolog

ACRONYMS AND ABBREVIATIONS

AW Supplement	*Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West* (Version 2.0)
FAC	Facultative
FACU	Facultative Upland
FACW	Facultative Wetland
LRR	Land Resource Region
NHD	National Hydrography Dataset
NI	No Indicator
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OBL	Obligate
Project	Horse Heaven Wind Farm Project
SDAM	Streamflow Duration Assessment Method for the Pacific Northwest
Tetra Tech	Tetra Tech, Inc.
the Manual	Wetlands Delineation Manual, Technical Report Y-87-1
UPL	Upland
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
WETS	Climate Analysis for Wetlands Tables

1 INTRODUCTION

An approximately 21,680-acre area was surveyed for wetlands and other waters as part of the reporting for the proposed Horse Heaven Wind Farm Project (Project) in Benton County. The Project is a commercial wind and solar project with a nominal nameplate energy generating capacity of up to 1,150 megawatts proposed by Scout Clean Energy and located in Benton County, Washington. Tetra Tech, Inc. employed two staff experienced in conducting wetland delineations in the Arid West region of the United States. The surveys were completed in pairs with senior staff supervising junior staff. The staff included:

- Jessica Taylor, Wetland Scientist, who has over 15 years of experience conducting wetland and other waters of the U.S. assessments in the Pacific Northwest; and
- Katie Pyne, Biologist, who has 2 years of experience conducting wetland and other waters of the U.S. assessments in the Pacific Northwest.

2 LANDSCAPE SETTING AND LAND USE

2.1 Project Study Area

The Project study area encompasses 21,680 acres of mostly dryland agricultural crops and private homes (Figure A-1). This area receives between 6 and 8 inches of precipitation annually and includes no irrigated crops. Agricultural crops are winter wheat followed by a chemical fallow rotation. Grazing does occur on the stubble left behind after wheat harvest and on the lands where cropping is not feasible.

2.2 Landscape Setting

The Project is located within the Level III Columbia Plateau Ecoregion, and within the further subdivided Level IV, Yakima Folds Ecoregion (Thorson et al. 2003). In addition, the Project is within U.S. Department of Agriculture (USDA) Land Resource Region (LRR) B, Northwestern Wheat and Range Region (NRCS 2006). LRR B, Northwestern Wheat and Range Region, overlaps within the Project study area with LRR B Columbia/Snake River Plateau Region in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Version 2.0; U.S. Army Corps of Engineers [USACE] 2008) (AW Supplement).

Plant species names and associated wetland indicator status ratings are from the State of Washington 2016 Wetland Plant List (Lichvar et al. 2016). The following wetland indicator ratings are ordered according to the percent likelihood, from most likely to least likely, of the plant occurring in wetlands: Obligate (OBL), Facultative Wetland (FACW), Facultative (FAC), Facultative Upland (FACU), and Upland (UPL). Species with an indicator of NI (No Indicator) refers to plants that are not listed in the wetland plant list and are thereby considered to be upland plants.

Woody vegetation commonly observed in the Project study area included big sagebrush (*Artemisia tridentata,* UPL), yellow rabbitbrush (*Chrysothamnus viscidiflorus,* UPL), and rubber rabbitbrush (*Ericameria nauseosa,* UPL).

Herbaceous species documented in upland areas included intermediate wheatgrass (*Agropyron intermedium,* UPL), bluebunch wheatgrass (*Pseudoroegneria spicata,* UPL), medusahead grass (*Taeniatherum caput-medusae,* UPL), bulbous bluegrass (*Poa bulbosa,* UPL), Idaho fescue (*Festuca idahoensis,* FACU), common yarrow (*Achillea millefolium,* FACU), tall fescue (*Schedonorus*

arundinaceus, FAC), lupine (*Lupinus* sp., UPL), nineleaf biscuit-root (*Lomatium triternatum,* UPL), and yellow salsify (*Tragapogon dubius*, UPL).

The Washington State Department of Ecology requests information of priority habitats and species from the Washington Department of Fish and Wildlife. Surveys for specialized habitats and species are being assessed as part of separate reports in support of this Project and can be made available as requested.

2.3 National Wetlands Inventory and Natural Resources Conservation Service Soils

Prior to field work, Tetra Tech reviewed the National Wetlands Inventory (NWI), Natural Resource Conservation Service (NRCS) hydric soils data, and aerial photographs to identify potential wetlands and other waters, as described below.

2.3.1 National Wetlands Inventory Data

Desktop review of NWI data identified no wetlands within the Project study area. Figure A-2 of Appendix A shows the National Hydrography Dataset (NHD) map layered over the Project study area.

2.3.2 NRCS Hydric Soils Data

Nineteen soil map units are mapped in the Project study area (Table 1, and Figure A-3 [NRCS 2020]). The dominant soil in the Project study area is Ritzville silt loam, with 0 to 5 percent slopes covering 85.6 percent of the Project study area. There are no soils in the Project study area that are considered hydric soils.

Table 1. Soils Mapped in the Project Study Area[1]

Map Symbol	Unit Name	Hydric Soil Y/N	Acres	Percent of Project Study Area
BmAB	Burke silt loam, 0 to 5 percent slopes	No	59.1	0.3%
EfB	Ellisforde silt loam, 0 to 5 percent slopes	No	105.5	0.5%
EfE3	Ellisforde silt loam, 15 to 30 percent slopes, severely eroded	No	18	0.1%
EsB	Esquatzel fine sandy loam, 0 to 5 percent slopes	No	10.7	0.0%
EuAB	Esquatzel silt loam, 0 to 5 percent slopes	No	4	0.0%
FeC	Finley fine sandy loam, 0 to 15 percent slopes	No	10	0.0%
KnE	Kiona very stony silt loam, 0 to 30 percent slopes	No	47.3	0.2%
KnF	Kiona very stony silt loam, 30 to 65 percent slopes	No	41.3	0.2%
ReB	Ritzville silt loam, 0 to 5 percent slopes	No	18,547.5	85.6%
ReE3	Ritzville silt loam, 15 to 30 percent slopes, severely eroded	No	1,347.5	6.2%
ReF	Ritzville silt loam, 30 to 65 percent slopes	No	621	2.9%
RfD2	Ritzville very fine sandy loam, 0 to 15 percent slopes, eroded	No	502.4	2.3%
ShAB	Shano silt loam, 0 to 5 percent slopes	No	112.5	0.5%
ShE3	Shano silt loam, 15 to 30 percent slopes, severely eroded	No	66.5	0.3%
ShF	Shano silt loam, 30 to 65 percent slopes	No	31.6	0.1%
SnD2	Shano very fine sandy loam, 0 to 15 percent slopes, eroded	No	20.9	0.1%
WdF	Warden silt loam, 30 to 65 percent slopes	No	26.7	0.1%

Map Symbol	Unit Name	Hydric Soil Y/N	Acres	Percent of Project Study Area
WsB	Willis silt loam, 0 to 5 percent slopes	No	55.8	0.3%
WsE3	Willis silt loam, 15 to 30 percent slopes, severely eroded	No	50.9	0.2%

[1] NRCS 2020a

3 SITE ALTERATIONS

Site alterations are those activities that directly or indirectly impact wetlands and other waters such that the function or area of the feature changes significantly. A significant alteration would be one that renders the feature non-functioning, or one that changes the boundaries. Land use in the Project study area is generally dominated by agricultural activities including wheat farming and open range grazing. Tillage practices are changing across the region, and the conversion to reduced till and no-till methods of farming has decreased the amount of overland flow and increased the infiltration rates on site. The alterations associated with these practices may have affected the geographic size and/or the hydroperiod of wetlands and other waters. Some waters that were delineated in the study area are likely to have had historically higher flows due to runoff from the farmed fields that would not be present with the new farming practices.

4 PRECIPITATION DATA AND ANALYSIS

Average historical monthly precipitation data and daily precipitation data for the periods preceding and during field work were obtained from the National Oceanic and Atmospheric Administration's National Weather Service (NOAA 2020; Table 2). The closest geographical location with an NRCS WETS table is for Kennewick, Washington (NRCS 2020b).

The annual precipitation before the 2020 surveys was 90 percent of normal and the annual precipitation before the 2021 surveys was 65 percent of normal. Based on the precipitation data for the 3 months preceding the site visits in 2020, it was estimated that groundwater was about average for what is usually encountered at that time of year (Table 2). Based on the precipitation data for the 3 months preceding the site visits in 2021, it was estimated that groundwater was below average for what is usually encountered at this time of year (Table 3).

The lower than normal precipitation levels did not affect the delineation of waters as determinations of intermittent versus ephemeral stream were made using indicators described in the Streamflow Duration Assessment Method for the Pacific Northwest (SDAM) (Nadeau 2015). The SDAM relies on multiple indicators independent of the presence/absence of hydrology, in particular, vegetation and the slope of the channel.

4.1 February 2020 Site Visits

Field surveys for wetlands and other waters were conducted from February 19th to 23rd, 2020. There was no measurable precipitation in the 10 days preceding field work, and on the final day of field data collection the month-to-date precipitation for February was 42 percent of normal. Monthly precipitation totals for November and December were well below average while January was just under average.

4.2 August 2020 Site Visits

Field surveys for wetlands and other waters were conducted on August 26th and 27th, 2020. There was 0.01 inch of measurable precipitation within the 10 days preceding field work, and the total amount precipitation for August was 65 percent of normal. Precipitation was lower than normal in July and August; however, May and June were well above normal precipitation rates.

4.3 October 2020 Site Visits

Field surveys for wetlands and other waters were conducted on October 19th and 20th, 2020. There was 0.19 inches of measurable precipitation within the 10 days preceding field work, and the total amount precipitation for October was only 43 percent of normal. Precipitation was lower than normal in August and September as well.

4.4 November 2020 Site Visit

Field surveys for wetlands and other waters were conducted on November 30th, 2020. There was 0.06 inches of measurable precipitation within the 10 days preceding field work, and the total amount of precipitation for November was 143 percent of normal. Precipitation was lower than normal in September and October.

4.5 May 2021 Site Visit

Field surveys for wetlands and other waters were conducted on May 11th, 2021. There was 0.01 inches of measurable precipitation within the 10 days preceding field work, and the total amount of precipitation for April was 0 percent of normal. December and February had higher than average amounts of rainfall. March was much drier than the average at 17 percent of normal and only a trace of rain fell in April compared to the 0.53 average inches.

Table 2. Precipitation Data – Water Year 2019 to 2020: Current and Historical (Inches)

Precipitation Data Source	Oct 2019	Nov 2019	Dec 2019	Jan 2020	Feb 2020	Mar 2020	Apr 2020	May 2020	Jun 2020	Jul 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Annual Total to Date (November 2020)
Recorded Monthly Precipitation Totals (inches) (Pasco, WA)	0.48	0.18	0.47	1.00	0.32	0.49	0.19	1.08	0.55	0.04	0.17	0.05	0.27	1.32	7.13
WETS Accumulated Monthly Averages (inches) (Kennewick, WA)	0.60	0.92	1.15	1.07	0.76	0.71	0.53	0.74	0.50	0.18	0.26	0.33	0.60	0.92	7.89
Recorded Precipitation Relative to Average Monthly Precipitation (Kennewick, WA)	80%	20%	41%	93%	42%	69%	36%	146%	110%	22%	65%	15%	43%	143%	90%

Table 3. Precipitation Data – Water Year 2020 to 2021: Current and Historical (Inches)

Precipitation Data Source	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	Annual Total to Date (May 2021)
Recorded Monthly Precipitation Totals (inches) (Pasco, WA)	0.48	0.18	1.17	0.54	1.84	0.12	0	0.04	4.24
WETS Accumulated Monthly Averages (inches) (Kennewick, WA)	0.60	0.92	1.15	1.07	0.76	0.71	0.53	0.74	6.49
Recorded Precipitation Relative to Average Monthly Precipitation (Kennewick, WA)	80%	20%	102%	50%	242%	17%	0%	5%	65%

5 METHODS

5.1 Pre-field Work

In preparation for the field work, Tetra Tech reviewed NWI, NHD (USGS 2020), hydric soils data, and aerial photographs to identify potential wetlands and other waters, as described in the preceding sections. Tetra Tech prepared digital field maps with these data and uploaded these maps onto a Samsung Android data collection tablet to assist field staff in identifying the locations of probable wetlands and non-wetland waters within or adjacent to the Project study area.

Wetlands and surface water data were obtained from NWI (NWI 2020). Soils data were obtained from the NRCS Web Soil Survey (NRCS 2020a). Tetra Tech used high-resolution Google Earth Pro historical imagery to identify potential wetland areas (Google Earth 2020). Tetra Tech also reviewed the Washington Natural Heritage Program for high-quality wetlands in or near the Project study area (Heritage Program 2018). No high-quality wetlands were present in the Project study area.

The following guidance documents and procedures were reviewed:

- *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West* (Version 2.0) (USACE 2008);
- *Wetlands Delineation Manual*, Technical Report Y-87-1 (the Manual) (USACE 1987);
- Streamflow Duration Assessment Method for the Pacific Northwest (Nadeau 2015); and
- Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al. 1979).

5.2 Field Work

Field investigations for the delineation of wetlands and other waters included pedestrian surveys within the Project study area. Tetra Tech conducted the field delineation on February 19th through February 23rd, 2020 with follow-ups on August 26th and 27th, October 19th and 20th, and November 30th, 2020; and another follow-up visit on May 11th, 2021. The desktop wetland data were used to focus the wetland delineations, while the desktop surface water data were used to focus the non-wetlands water evaluation as necessary.

5.2.1 Wetland Delineations

Wetland presence was determined as per methods in the Manual and the AW Supplement. Two sample sites were investigated at representative low elevations within the Project study area (see Appendix B for USACE data sheets for each site). Wetland indicator status for plants was determined using the State of Washington 2016 Wetland Plant List (Lichvar et al. 2016). No wetland indicators were found at any of the low elevation sites on the landscape nor were they found within the ephemeral streambeds.

5.2.2 Non-wetland Waters Evaluations

Non-wetland waters evaluated using the following criteria.

- Flow duration for non-wetland waters was determined using SDAM (Nadeau 2015). Details on mapping methods are presented in Section 8.0.
- The centerline of non-wetland waters less than 6 feet in width was recorded as a line feature and buffered to the stream width determined in the field.

- Photographs were taken to document streams, ditches, and upland conditions at locations that NHD mapped as streams (Appendix C, Photolog).
- As water flows downstream, sites with upland conditions and lack of bed and banks were used to determine that the same conditions exist for sites uphill within the same drainage.

6 DESCRIPTION OF WETLANDS AND OTHER WATERS

All wetlands, non-wetland waters, and roadside drainage ditches evaluated in the Project study area are depicted in the Figure A-4 mapbook.

6.1 Wetlands

There are no wetlands within the Project study area, however, one wetland was identified outside of the Project study area. This wetland (E10) was surveyed at the request of the Department of Ecology. It lies approximately 240 feet west of the Project study area boundary. Figure A-4, Map 11 shows the location of the wetland in relation to the Project study area and the USACE data sheets are located in Appendix B. Photos of the site are in the photolog in Appendix C, pages C-98 and C-99.

6.2 Non-Wetland Waters

Thirty-one ephemeral streams and two intermittent streams were delineated within the Project study area. Table 3 below contains the acres of streams delineated within the larger Project area and is not limited to the stream segments that are present within the micrositing corridor. Stream acreage was determined by multiplying the average stream width by the length of the segment within the Project study area.

Table 4. Non-wetland Waters

Feature Name	Feature Type	Acres
EPH100	Ephemeral Stream	0.07
EPH101	Ephemeral Stream	0.00
EPH102	Ephemeral Stream	0.06
EPH104	Ephemeral Stream	0.15
EPH105	Ephemeral Stream	0.03
EPH200	Ephemeral Stream	0.02
EPH202	Ephemeral Stream	0.02
EPH203	Ephemeral Stream	0.03
EPH205	Ephemeral Stream	0.04
EPH206	Ephemeral Stream	0.02
EPH300	Ephemeral Stream	0.05
EPH301	Ephemeral Stream	0.02
EPH302	Ephemeral Stream	0.03
EPH303	Ephemeral Stream	0.04
EPH305	Ephemeral Stream	0.02
EPH306	Ephemeral Stream	0.09
EPH307	Ephemeral Stream	0.11
EPH308	Ephemeral Stream	0.03
EPH400	Ephemeral Stream	0.08
EPH401	Ephemeral Stream	0.46
EPH411	Ephemeral Stream	0.11
EPH413	Ephemeral Stream	0.07
EPH500	Ephemeral Stream	0.03
EPH501	Ephemeral Stream	0.04
EPH600	Ephemeral Stream	0.04
EPH602	Ephemeral Stream	0.07
EPH700	Ephemeral Stream	0.43
EPH800	Ephemeral Stream	0.15
EPH900	Ephemeral Stream	0.17
EPH904	Ephemeral Stream	0.01
EPH905	Ephemeral Stream	0.00
INT01	Intermittent Stream	0.02
INT02	Intermittent Stream	0.02
Grand Total		**2.56**

7 DEVIATION FROM NWI

The NWI showed no wetlands in the Project study area. Field surveys found one wetland outside of the Project study area.

8 MAPPING METHODS

Photograph and sample plot locations were recorded using a Samsung tablet equipped with ArcGIS Field Collector software and the Juniper Geode series GPS unit. This unit streams raw satellite data configured to differentially correct positions in real time using the Satellite Based Augmentation System, which typically results in positional error of less than 1 meter. Photopoints are shown in Figures A-2, A-3, and A-4, and photos are provided in Appendix C.

9 RESULTS AND CONCLUSIONS

Using methods recommended in the USACE Manual and Arid West Supplement, no wetlands were found in the Project study area and one wetland was found within 300 feet of the Project study area. Two intermittent streams and 31 ephemeral streams were documented within the Project study area.

10 REFERENCES

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Fish and Wildlife Service, Washington, DC. FWS/OBS-79/31.

Google Earth v7.3.3.7786. 2020. Kennewick, WA. Available online: http://www.earth.google.com. Accessed February 2020.

Heritage Program (Washington Natural Heritage Program). 2018. Sections that contain Natural Heritage Features Associated with Wetlands. Available online: https://www.dnr.wa.gov/publications/amp_nh_wetlands_trs.pdf?kbi7wbv. Accessed February 2020.

Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. State of Washington 2016 Wetland Plant List. The National Wetland Plant List: 2016 wetland ratings. *Phytoneuron* 30: 1-17.

Nadeau, Tracie-Lynn. 2015. Streamflow Duration Assessment Method for the Pacific Northwest. EPA 910-K-14-001. U.S. Environmental Protection Agency, Region 10, Seattle, WA.

NOAA (National Oceanic and Atmospheric Administration). 2020. National Weather Service. Pasco, WA Climate Station. http://w2.weather.gov/climate/index.php?wfo=pqr. Accessed: February 2020.

NRCS (Natural Resources Conservation Service). 2006. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296.

NRCS. 2020a. Web Soil Survey. Available online at: http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx. Accessed: February 2020.

NRCS. 2020b. Wetlands (WETS) Climate Tables. Kennewick, WA. Available online at: https://www.wcc.nrcs.usda.gov/climate/wets_doc.html. Accessed: February 2020.

NWI (US Fish and Wildlife Service, National Wetlands Inventory). 2018 Wetlands Data by State, Washington. Available at: https://www.fws.gov/wetlands/Data/State-Downloads.html. Downloaded February 2020.

Thorson, T.D., S.A. Bryce, D.A. Lammers, A.J. Woods, J.M. Omernik, J. Kagan, D.E. Pater, and J.A. Comstock. 2003. Ecoregions of Washington (color poster with figure, descriptive text, summary tables, and photographs): Reston, Virginia, U.S. Geological Survey (figure scale 1:1,500,000). Available online at: https://www.epa.gov/eco-research/ecoregion-download-files-state-region-10#pane-45. Accessed: February 2020.

USACE (United States Army Corps of Engineers). 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. January. Wetlands Research Program. U.S. Army Corps of Engineers, Waterways Experiment Station, 3909 Halls Ferry Road, Vicksburg, MS 39180-6199.

USACE. 2008. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2). J.S. Wakeley, R.W. Lichvar, and C.V. Noble, eds. ERDC/EL TR-10-3. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

USDA-FSA AFPO (U.S. Department of Agriculture-Farm Service Agency Aerial Photography Field Office). 2017. NAIP MrSID Mosaic. Available online at: https://datagateway.nrcs.usda.gov/GDGHome_DirectDownLoad.aspx. Accessed: February 2020.

USGS (United States Geological Survey) National Hydrography Dataset (NHD). 2020. Available URL: http://datagateway.nrcs.usda.gov/. Accessed: 2020.

APPENDIX A
FIGURES

Horse Heaven Wind Project

SCOUT CLEAN ENERGY

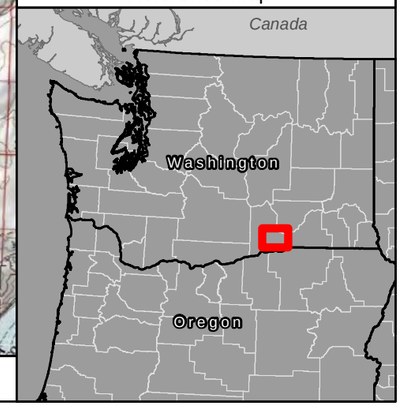
Figure A-1
Project Study Area

BENTON COUNTY, WA

Project Study Area

TETRA TECH

Reference Map



1:130,000 WGS 1984 UTM Zone 11N

0 0.5 1 2 3 4 Miles

NOT FOR CONSTRUCTION

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDS\MAPS\PROJECT_STUDY_AREA.mxd

Horse Heaven Wind Project

SCOUT CLEAN ENERGY

Figure A-2
Project Study Area NHD
Map 1 of 11

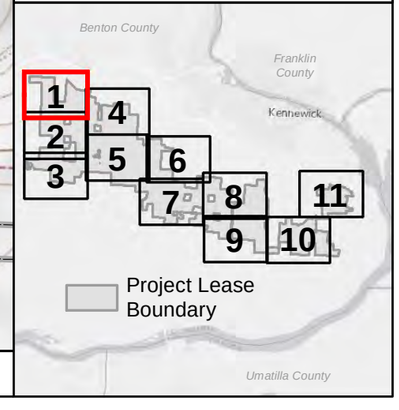
BENTON COUNTY, WA

Project Study Area Boundary

NHD Intermittent Stream

TETRA TECH

Reference Map



1:24,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDSMAPS\PROJECT_STUDY_AREA_NHD_NWI_MAPBOOK.mxd

Horse Heaven Wind Project

SCOUT CLEAN ENERGY

Figure A-2
Project Study Area NHD
Map 2 of 11

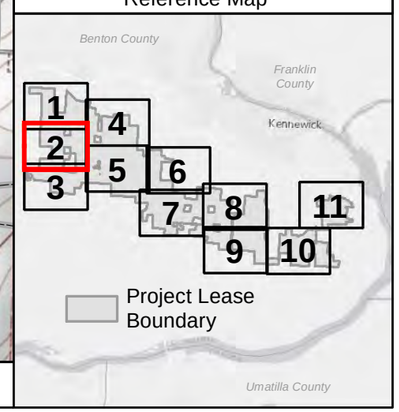
BENTON COUNTY, WA

Project Study Area Boundary

NHD Intermittent Stream

TETRA TECH

Reference Map



1:24,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDS\MAPS\PROJECT_STUDY_AREA_NHD_NWI_MAPBOOK.mxd

Horse Heaven Wind Project

SCOUT CLEAN ENERGY

Figure A-2
Project Study Area NHD
Map 3 of 11

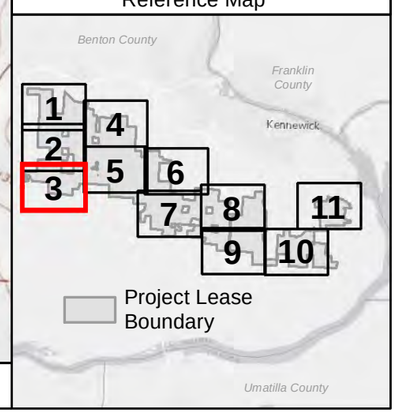
BENTON COUNTY, WA

Project Study Area Boundary

NHD Intermittent Stream

TETRA TECH

Reference Map



1:24,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDS\MAPS\PROJECT_STUDY_AREA_NHD_NWI_MAPBOOK.mxd

Horse Heaven Wind Project

SCOUT CLEAN ENERGY

Figure A-2
Project Study Area NHD
Map 4 of 11

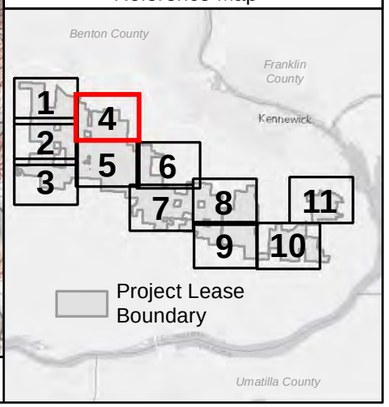
BENTON COUNTY, WA

Project Study Area Boundary

NHD Intermittent Stream

TETRA TECH

Reference Map



1:24,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDS\MAPS\PROJECT_STUDY_AREA_NHD_NWI_MAPBOOK.mxd

Horse Heaven Wind Project

SCOUT CLEAN ENERGY

Figure A-2
Project Study Area NHD
Map 5 of 11

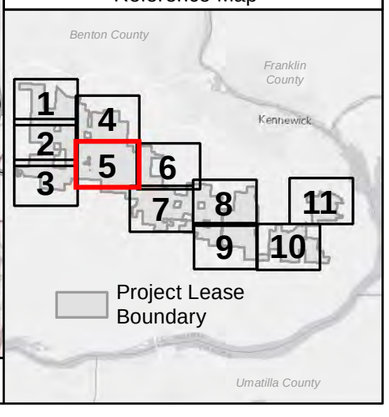
BENTON COUNTY, WA

Project Study Area Boundary

NHD Intermittent Stream

TETRA TECH

Reference Map



1:24,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDS\MAPS\PROJECT_STUDY_AREA_NHD_NWI_MAPBOOK.mxd

Horse Heaven Wind Project

SCOUT CLEAN ENERGY

Figure A-2
Project Study Area NHD
Map 6 of 11

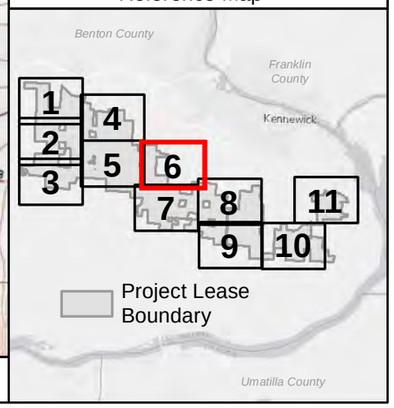
BENTON COUNTY, WA

Project Study Area Boundary

NHD Intermittent Stream

TETRA TECH

Reference Map



1:24,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDS\MAPS\PROJECT_STUDY_AREA_NHD_NWI_MAPBOOK.mxd

Horse Heaven Wind Project

SCOUT CLEAN ENERGY

Figure A-2
Project Study Area NHD
Map 7 of 11

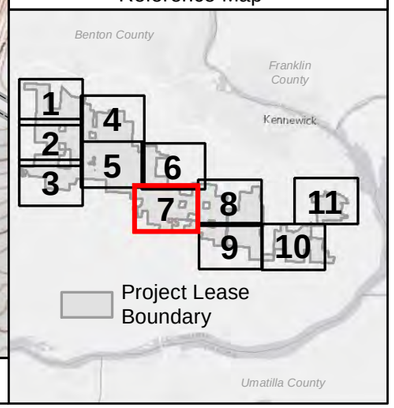
BENTON COUNTY, WA

Project Study Area Boundary

NHD Intermittent Stream

TETRA TECH

Reference Map



1:24,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDS\MAPS\PROJECT_STUDY_AREA_NHD_NWI_MAPBOOK.mxd

Horse Heaven Wind Project

SCOUT CLEAN ENERGY

Figure A-2
Project Study Area NHD
Map 8 of 11

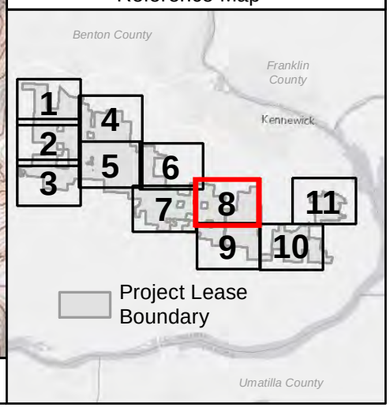
BENTON COUNTY, WA

Project Study Area Boundary

NHD Intermittent Stream

TETRA TECH

Reference Map



1:24,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDS\MAPS\PROJECT_STUDY_AREA_NHD_NWI_MAPBOOK.mxd

Horse Heaven Wind Project

SCOUT CLEAN ENERGY

Figure A-2
Project Study Area NHD
Map 9 of 11

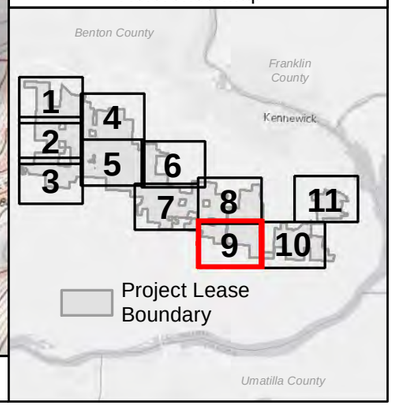
BENTON COUNTY, WA

Project Study Area Boundary

NHD Intermittent Stream

TETRA TECH

Reference Map



1:24,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDS\MAPS\PROJECT_STUDY_AREA_NHD_NWI_MAPBOOK.mxd

Horse Heaven Wind Project

SCOUT CLEAN ENERGY

Figure A-2
Project Study Area NHD
Map10 of 11

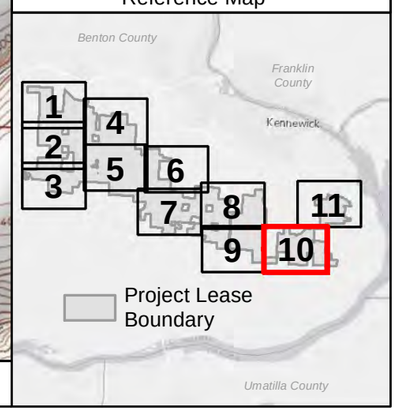
BENTON COUNTY, WA

Project Study Area Boundary

NHD Intermittent Stream

TETRA TECH

Reference Map



1:24,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDS\MAPS\PROJECT_STUDY_AREA_NHD_NWI_MAPBOOK.mxd

Horse Heaven Wind Project

SCOUT CLEAN ENERGY

Figure A-2
Project Study Area NHD
Map11 of 11

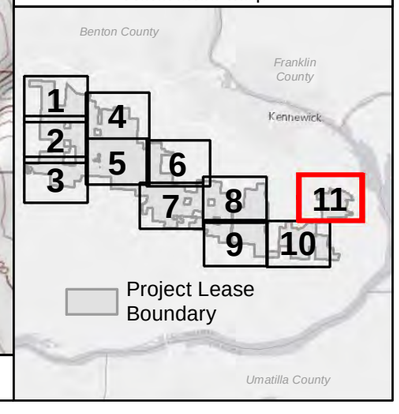
BENTON COUNTY, WA

Project Study Area Boundary

NHD Intermittent Stream

TETRA TECH

Reference Map



1:24,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDS\MAPS\PROJECT_STUDY_AREA_NHD_NWI_MAPBOOK.mxd

Horse Heaven Wind Project

SCOUT CLEAN ENERGY

Figure A-3
Project Study Area Soils
Map 1 of 11

BENTON COUNTY, WA

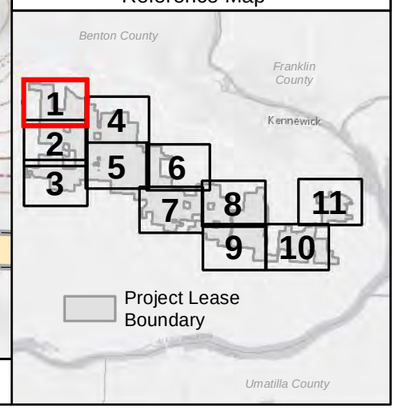
Project Study Area Boundary

Mapunit Symbol: Mapunit Name

- FeC: Finley fine sandy loam, 0 to 15 percent slopes
- KnE: Kiona very stony silt loam, 0 to 30 percent slopes
- ReB: Ritzville silt loam, 0 to 5 percent slopes
- ReE3: Ritzville silt loam, 15 to 30 percent slopes, severely eroded
- ReF: Ritzville silt loam, 30 to 65 percent slopes
- RfD2: Ritzville very fine sandy loam, 0 to 15 percent slopes, eroded
- WsB: Willis silt loam, 0 to 5 percent slopes

TETRA TECH

Reference Map



1:24,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDSMAPS\PROJECT_STUDY_AREA_SOILS_MAPBOOK.mxd

Horse Heaven Wind Project

SCOUT CLEAN ENERGY

Figure A-3
Project Study Area Soils
Map 2 of 11

BENTON COUNTY, WA

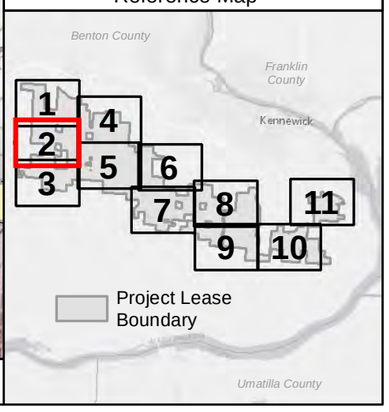
Project Study Area Boundary

Mapunit Symbol: Mapunit Name

- FeC: Finley fine sandy loam, 0 to 15 percent slopes
- ReB: Ritzville silt loam, 0 to 5 percent slopes
- ReE3: Ritzville silt loam, 15 to 30 percent slopes, severely eroded
- RfD2: Ritzville very fine sandy loam, 0 to 15 percent slopes, eroded

TETRA TECH

Reference Map



1:24,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDS\MAPS\PROJECT_STUDY_AREA_SOILS_MAPBOOK.mxd

Horse Heaven Wind Project

SCOUT CLEAN ENERGY

Figure A-3
Project Study Area Soils
Map 3 of 11

BENTON COUNTY, WA

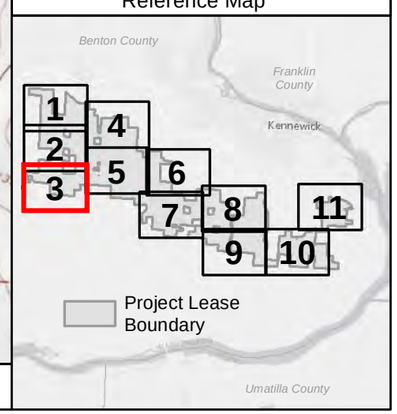
Project Study Area Boundary

Mapunit Symbol: Mapunit Name

- FeC: Finley fine sandy loam, 0 to 15 percent slopes
- ReB: Ritzville silt loam, 0 to 5 percent slopes
- ReE3: Ritzville silt loam, 15 to 30 percent slopes, severely eroded
- ShAB: Shano silt loam, 0 to 5 percent slopes
- ShE3: Shano silt loam, 15 to 30 percent slopes, severely eroded
- WsB: Willis silt loam, 0 to 5 percent slopes

TETRA TECH

Reference Map



1:24,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDS\MAPS\PROJECT_STUDY_AREA_SOILS_MAPBOOK.mxd

Horse Heaven Wind Project

SCOUT CLEAN ENERGY

Figure A-3
Project Study Area Soils
Map 4 of 11

BENTON COUNTY, WA

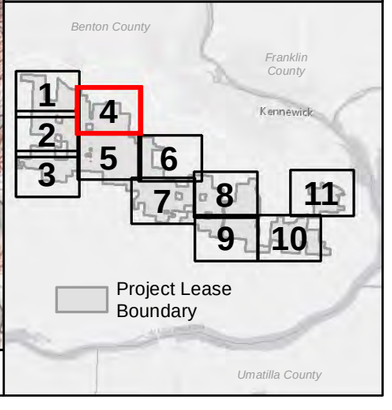
Project Study Area Boundary

Mapunit Symbol: Mapunit Name

- EfB: Ellisforde silt loam, 0 to 5 percent slopes
- EfE3: Ellisforde silt loam, 15 to 30 percent slopes, severely eroded
- KnE: Kiona very stony silt loam, 0 to 30 percent slopes
- KnF: Kiona very stony silt loam, 30 to 65 percent slopes
- ReB: Ritzville silt loam, 0 to 5 percent slopes
- ReE3: Ritzville silt loam, 15 to 30 percent slopes, severely eroded
- ReF: Ritzville silt loam, 30 to 65 percent slopes
- RfD2: Ritzville very fine sandy loam, 0 to 15 percent slopes, eroded
- WsB: Willis silt loam, 0 to 5 percent slopes

TETRA TECH

Reference Map



1:24,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDSMAPS\PROJECT_STUDY_AREA_SOILS_MAPBOOK.mxd

Horse Heaven Wind Project

SCOUT CLEAN ENERGY

Figure A-3
Project Study Area Soils
Map 5 of 11

BENTON COUNTY, WA

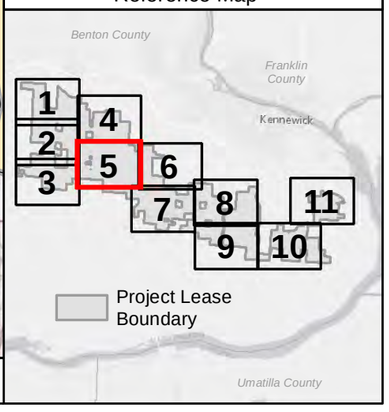
Project Study Area Boundary

Mapunit Symbol: Mapunit Name

- EfB: Ellisforde silt loam, 0 to 5 percent slopes
- FeC: Finley fine sandy loam, 0 to 15 percent slopes
- ReB: Ritzville silt loam, 0 to 5 percent slopes
- ReE3: Ritzville silt loam, 15 to 30 percent slopes, severely eroded
- ReF: Ritzville silt loam, 30 to 65 percent slopes
- RfD2: Ritzville very fine sandy loam, 0 to 15 percent slopes, eroded
- WsB: Willis silt loam, 0 to 5 percent slopes

TETRA TECH

Reference Map



1:24,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDS\MAPS\PROJECT_STUDY_AREA_SOILS_MAPBOOK.mxd

Horse Heaven Wind Project

SCOUT CLEAN ENERGY

Figure A-3
Project Study Area Soils
Map 6 of 11

BENTON COUNTY, WA

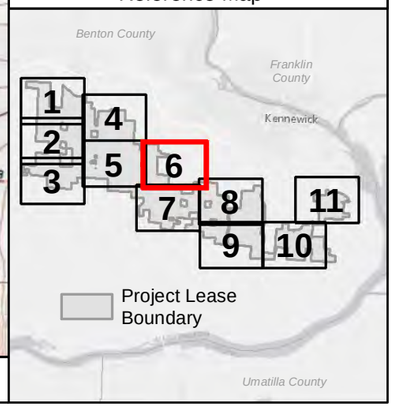
Project Study Area Boundary

Mapunit Symbol: Mapunit Name

- KnF: Kiona very stony silt loam, 30 to 65 percent slopes
- ReB: Ritzville silt loam, 0 to 5 percent slopes
- ReE3: Ritzville silt loam, 15 to 30 percent slopes, severely eroded
- ReF: Ritzville silt loam, 30 to 65 percent slopes
- RfD2: Ritzville very fine sandy loam, 0 to 15 percent slopes, eroded

TETRA TECH

Reference Map



1:24,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDS\MAPS\PROJECT_STUDY_AREA_SOILS_MAPBOOK.mxd

Horse Heaven Wind Project

SCOUT CLEAN ENERGY

Figure A-3
Project Study Area Soils
Map 7 of 11

BENTON COUNTY, WA

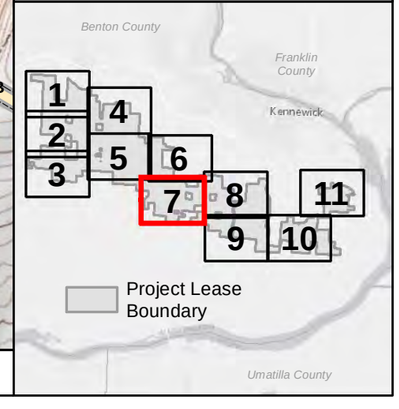
Project Study Area Boundary

Mapunit Symbol: Mapunit Name

- ReB: Ritzville silt loam, 0 to 5 percent slopes
- ReE3: Ritzville silt loam, 15 to 30 percent slopes, severely eroded
- ReF: Ritzville silt loam, 30 to 65 percent slopes
- RfD2: Ritzville very fine sandy loam, 0 to 15 percent slopes, eroded

TETRA TECH

Reference Map



1:24,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDS\MAPS\PROJECT_STUDY_AREA_SOILS_MAPBOOK.mxd

Horse Heaven Wind Project

SCOUT CLEAN ENERGY

Figure A-3
Project Study Area Soils
Map 8 of 11

BENTON COUNTY, WA

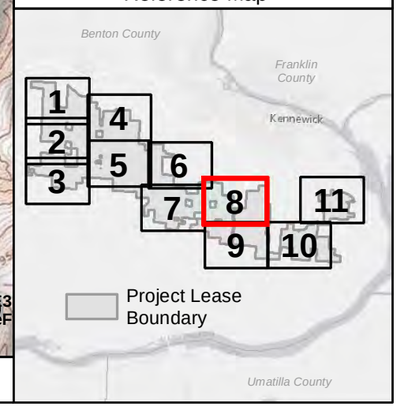
Project Study Area Boundary

Mapunit Symbol: Mapunit Name

- ReB: Ritzville silt loam, 0 to 5 percent slopes
- ReE3: Ritzville silt loam, 15 to 30 percent slopes, severely eroded
- ReF: Ritzville silt loam, 30 to 65 percent slopes
- RfD2: Ritzville very fine sandy loam, 0 to 15 percent slopes, eroded

TETRA TECH

Reference Map



1:24,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDS\MAPS\PROJECT_STUDY_AREA_SOILS_MAPBOOK.mxd

Horse Heaven Wind Project

SCOUT CLEAN ENERGY

Figure A-3
Project Study Area Soils
Map 9 of 11

BENTON COUNTY, WA

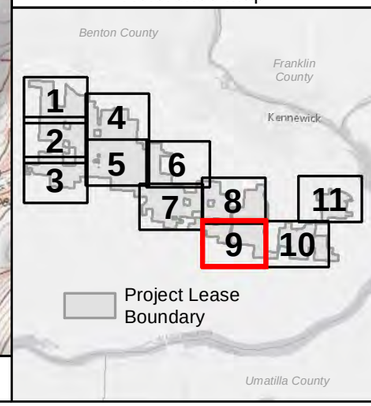
Project Study Area Boundary

Mapunit Symbol: Mapunit Name

- ReB: Ritzville silt loam, 0 to 5 percent slopes
- ReE3: Ritzville silt loam, 15 to 30 percent slopes, severely eroded
- ReF: Ritzville silt loam, 30 to 65 percent slopes
- RfD2: Ritzville very fine sandy loam, 0 to 15 percent slopes, eroded
- ShAB: Shano silt loam, 0 to 5 percent slopes
- ShE3: Shano silt loam, 15 to 30 percent slopes, severely eroded
- ShF: Shano silt loam, 30 to 65 percent slopes
- SnD2: Shano very fine sandy loam, 0 to 15 percent slopes, eroded

TETRA TECH

Reference Map



1:24,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDS\MAPS\PROJECT_STUDY_AREA_SOILS_MAPBOOK.mxd

Horse Heaven Wind Project

SCOUT CLEAN ENERGY

Figure A-3
Project Study Area Soils Map 10 of 11

BENTON COUNTY, WA

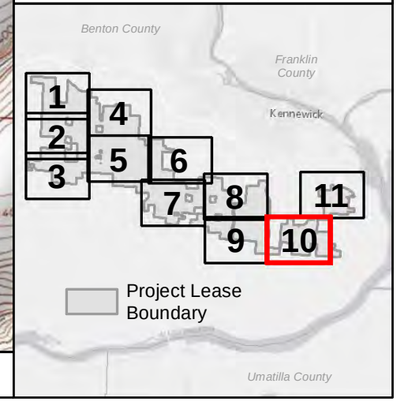
Project Study Area Boundary

Mapunit Symbol: Mapunit Name

- EuAB: Esquatzel silt loam, 0 to 5 percent slopes
- ReB: Ritzville silt loam, 0 to 5 percent slopes
- ReE3: Ritzville silt loam, 15 to 30 percent slopes, severely eroded
- ReF: Ritzville silt loam, 30 to 65 percent slopes
- ShAB: Shano silt loam, 0 to 5 percent slopes

TETRA TECH

Reference Map



1:24,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDS\MAPS\PROJECT_STUDY_AREA_SOILS_MAPBOOK.mxd

Horse Heaven Wind Project

SCOUT CLEAN ENERGY

Figure A-3
Project Study Area Soils Map 11 of 11

BENTON COUNTY, WA

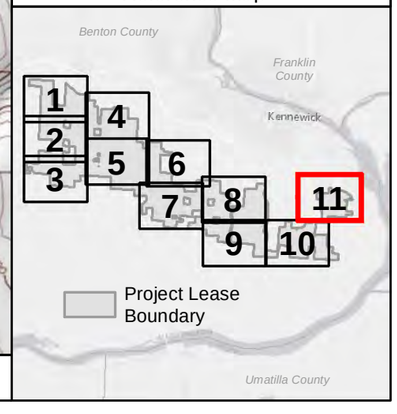
Project Study Area Boundary

Mapunit Symbol: Mapunit Name

- BmAB: Burke silt loam, 0 to 5 percent slopes
- EfB: Ellisforde silt loam, 0 to 5 percent slopes
- KnE: Kiona very stony silt loam, 0 to 30 percent slopes
- KnF: Kiona very stony silt loam, 30 to 65 percent slopes
- ReB: Ritzville silt loam, 0 to 5 percent slopes
- ReE3: Ritzville silt loam, 15 to 30 percent slopes, severely eroded
- ReF: Ritzville silt loam, 30 to 65 percent slopes
- ShAB: Shano silt loam, 0 to 5 percent slopes
- ShE3: Shano silt loam, 15 to 30 percent slopes, severely eroded
- ShF: Shano silt loam, 30 to 65 percent slopes
- WdF: Warden silt loam, 30 to 65 percent slopes

TETRA TECH

Reference Map



1:24,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDS\MAPS\PROJECT_STUDY_AREA_SOILS_MAPBOOK.mxd

Horse Heaven Wind Project

Figure A-4
Field Delineated WOUS/WOS
Map 1 of 23

BENTON COUNTY, WA

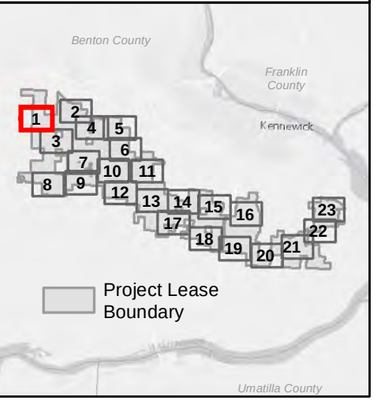
609
718
714
715
716
717

Project Study Area Boundary

Photo Point Location w/Direction

TETRA TECH

Reference Map



1:12,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

NOT FOR CONSTRUCTION

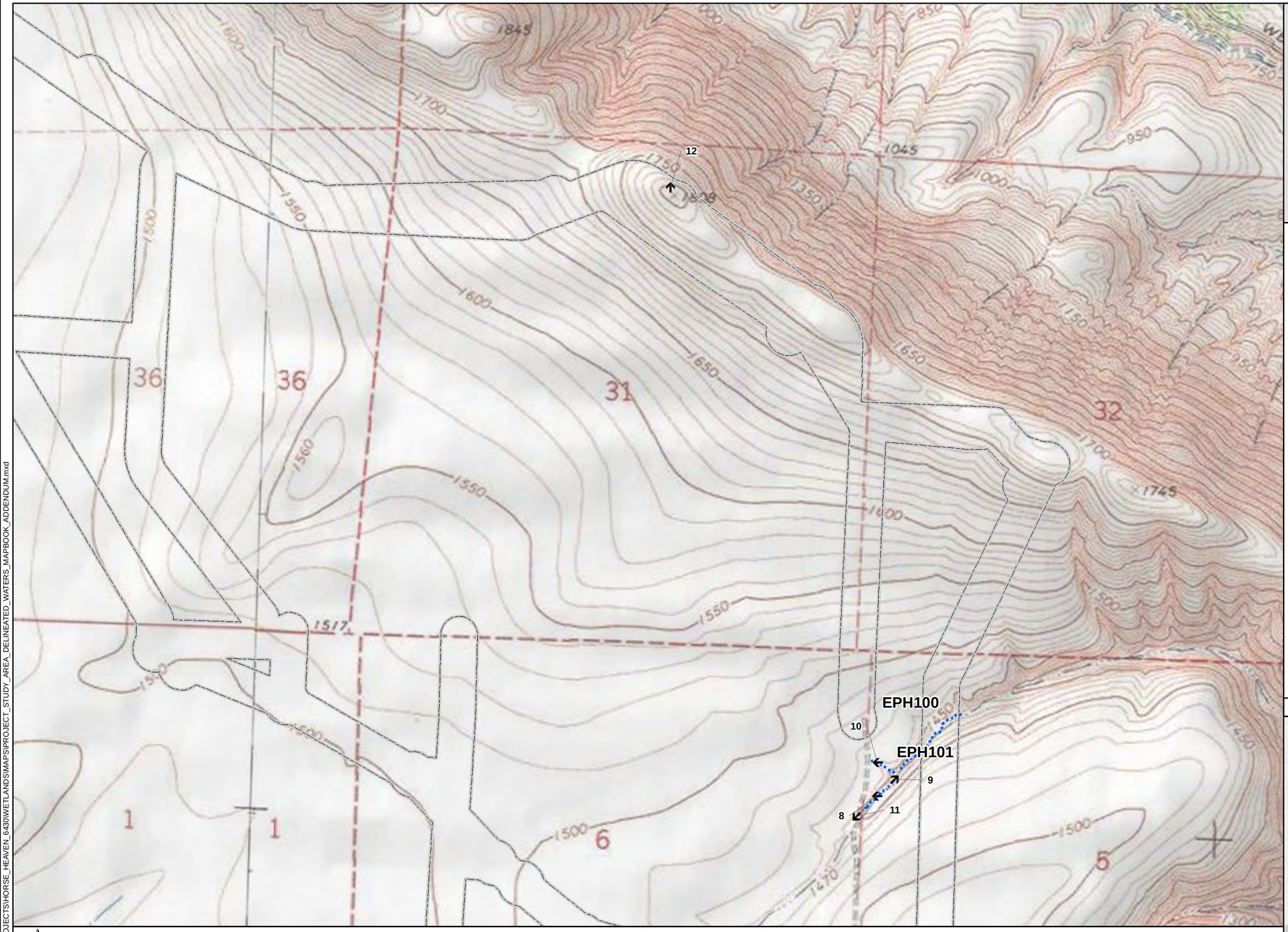
R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDSMAPS\PROJECT_STUDY_AREA_DELINEATED_WATERS_MAPBOOK_ADDENDUM.mxd

Horse Heaven Wind Project

SCOUT CLEAN ENERGY

Figure A-4
Field Delineated WOUS/WOS
Map 2 of 23

BENTON COUNTY, WA



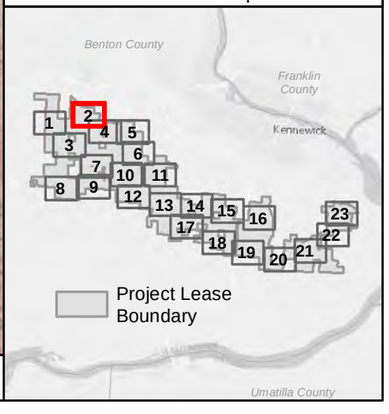
Project Study Area Boundary

Photo Point Location w/Direction

Ephemeral Stream

TETRA TECH

Reference Map



1:12,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

NOT FOR CONSTRUCTION

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDS\MAPS\PROJECT_STUDY_AREA_DELINEATED_WATERS_MAPBOOK_ADDENDUM.mxd

Horse Heaven Wind Project

SCOUT CLEAN ENERGY

Figure A-4
Field Delineated WOUS/WOS
Map 3 of 23

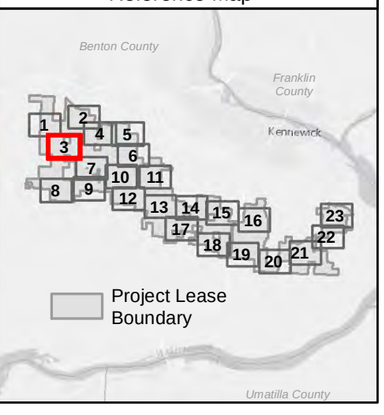
BENTON COUNTY, WA

Project Study Area Boundary

Photo Point Location w/Direction

TETRA TECH

Reference Map



614

90

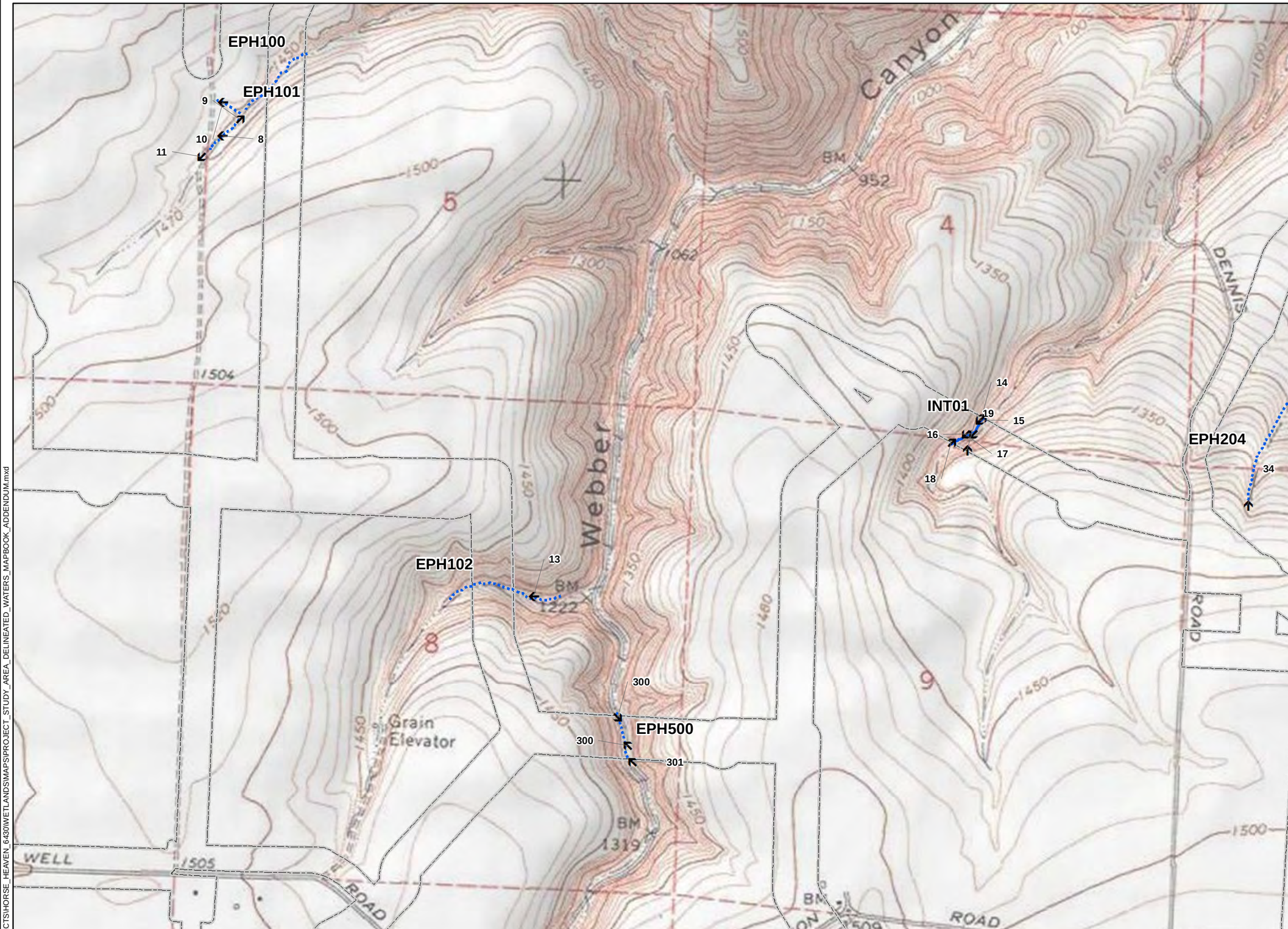
XBB902

1:12,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

NOT FOR CONSTRUCTION

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDS\MAPS\PROJECT_STUDY_AREA_DELINEATED_WATERS_MAPBOOK_ADDENDUM.mxd



Horse Heaven Wind Project

SCOUT CLEAN ENERGY

Figure A-4
Field Delineated WOUS/WOS
Map 4 of 23

BENTON COUNTY, WA

Project Study Area Boundary

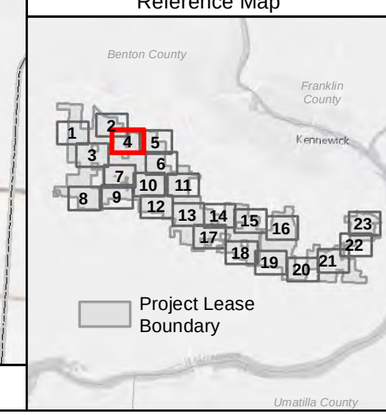
Photo Point Location w/Direction

Ephemeral Stream

Intermittent Stream

TETRA TECH

Reference Map



R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDS\MAPS\PROJECT_STUDY_AREA_DELINEATED_WATERS_MAPBOOK_ADDENDUM.mxd

Horse Heaven Wind Project

SCOUT CLEAN ENERGY

Figure A-4
Field Delineated WOUS/WOS
Map 5 of 23

BENTON COUNTY, WA

EPH105
EPH104
EPH-104
EPH204
EPH205
EPH202
EPH203
22
23
24
21
3
20
34
33
90
31
311
312
313
45

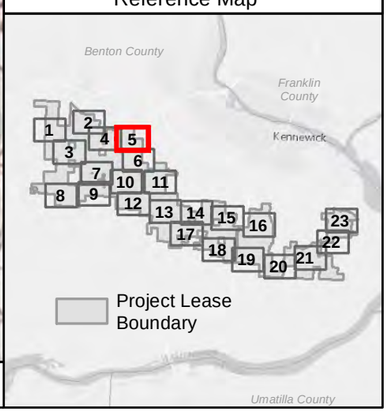
Project Study Area Boundary

Photo Point Location w/Direction

Ephemeral Stream

TETRA TECH

Reference Map



1:12,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

NOT FOR CONSTRUCTION

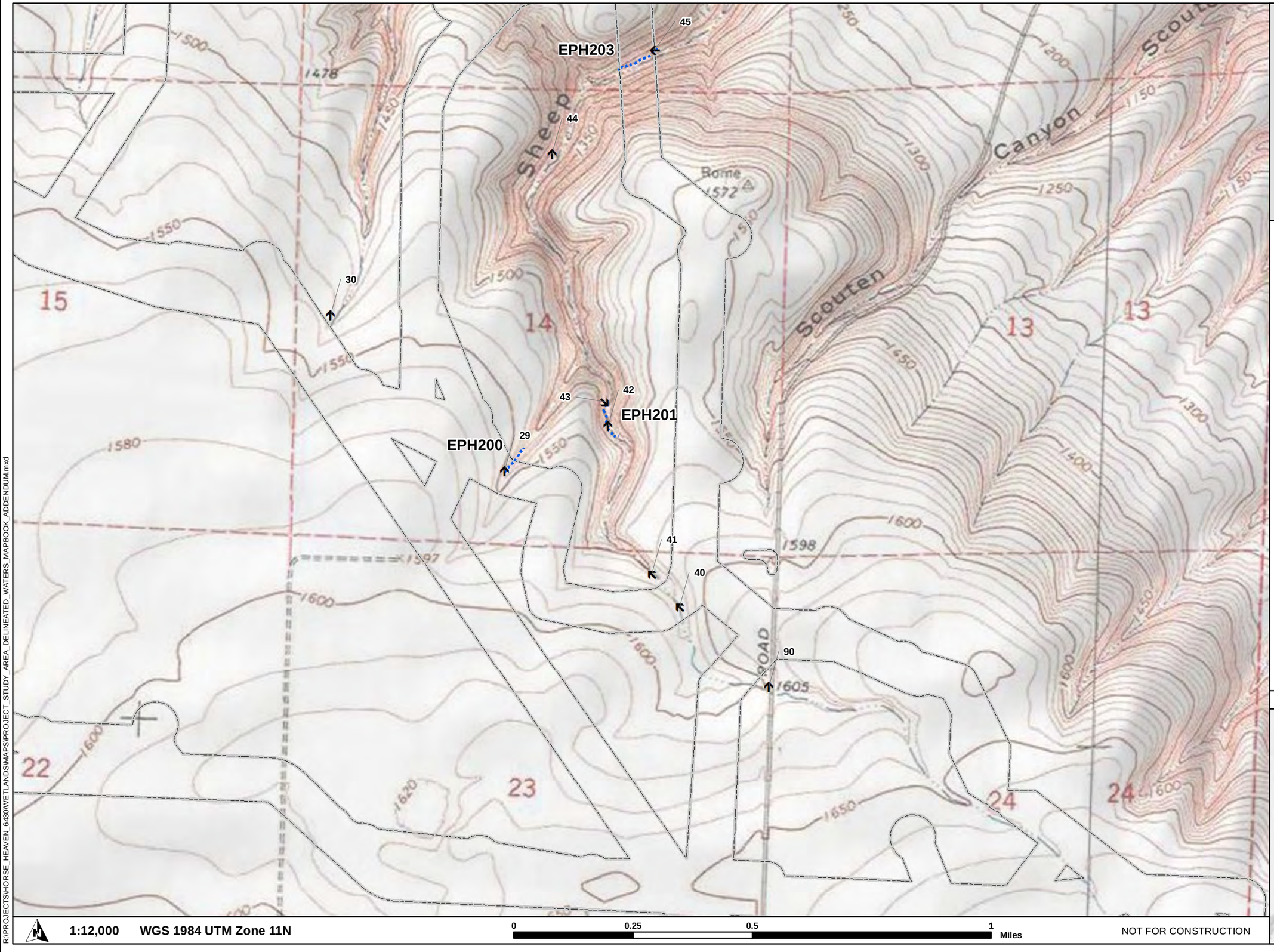
R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDS\MAPS\PROJECT_STUDY_AREA_DELINEATED_WATERS_MAPBOOK_ADDENDUM.mxd

Horse Heaven Wind Project

SCOUT CLEAN ENERGY

Figure A-4
Field Delineated WOUS/WOS
Map 6 of 23

BENTON COUNTY, WA



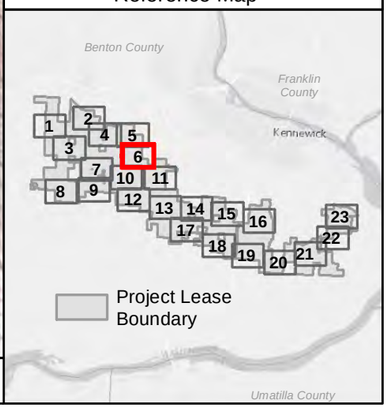
Project Study Area Boundary

Photo Point Location w/Direction

Ephemeral Stream

TETRA TECH

Reference Map



1:12,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

NOT FOR CONSTRUCTION

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDS\MAPS\PROJECT_STUDY_AREA_DELINEATED_WATERS_MAPBOOK_ADDENDUM.mxd

Horse Heaven Wind Project

Figure A-4
Field Delineated WOUS/WOS
Map 7 of 23

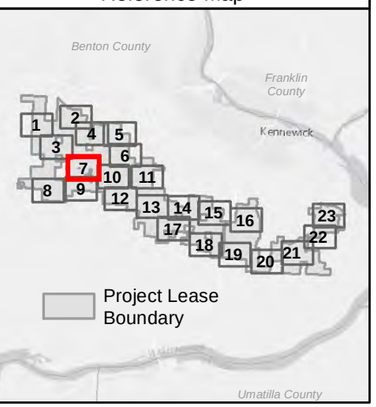
BENTON COUNTY, WA

Project Study Area Boundary

Photo Point Location w/Direction

TETRA TECH

Reference Map



1:12,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

NOT FOR CONSTRUCTION

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDS\MAPS\PROJECT_STUDY_AREA_DELINEATED_WATERS_MAPBOOK_ADDENDUM.mxd



Horse Heaven Wind Project

SCOUT CLEAN ENERGY

Figure A-4
Field Delineated WOUS/WOS
Map 8 of 23

BENTON COUNTY, WA

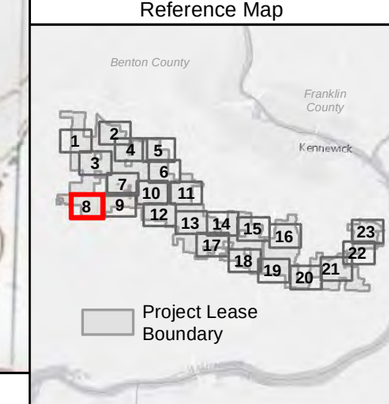
Project Study Area Boundary

Photo Point Location w/Direction

Ephemeral Stream

TETRA TECH

Reference Map

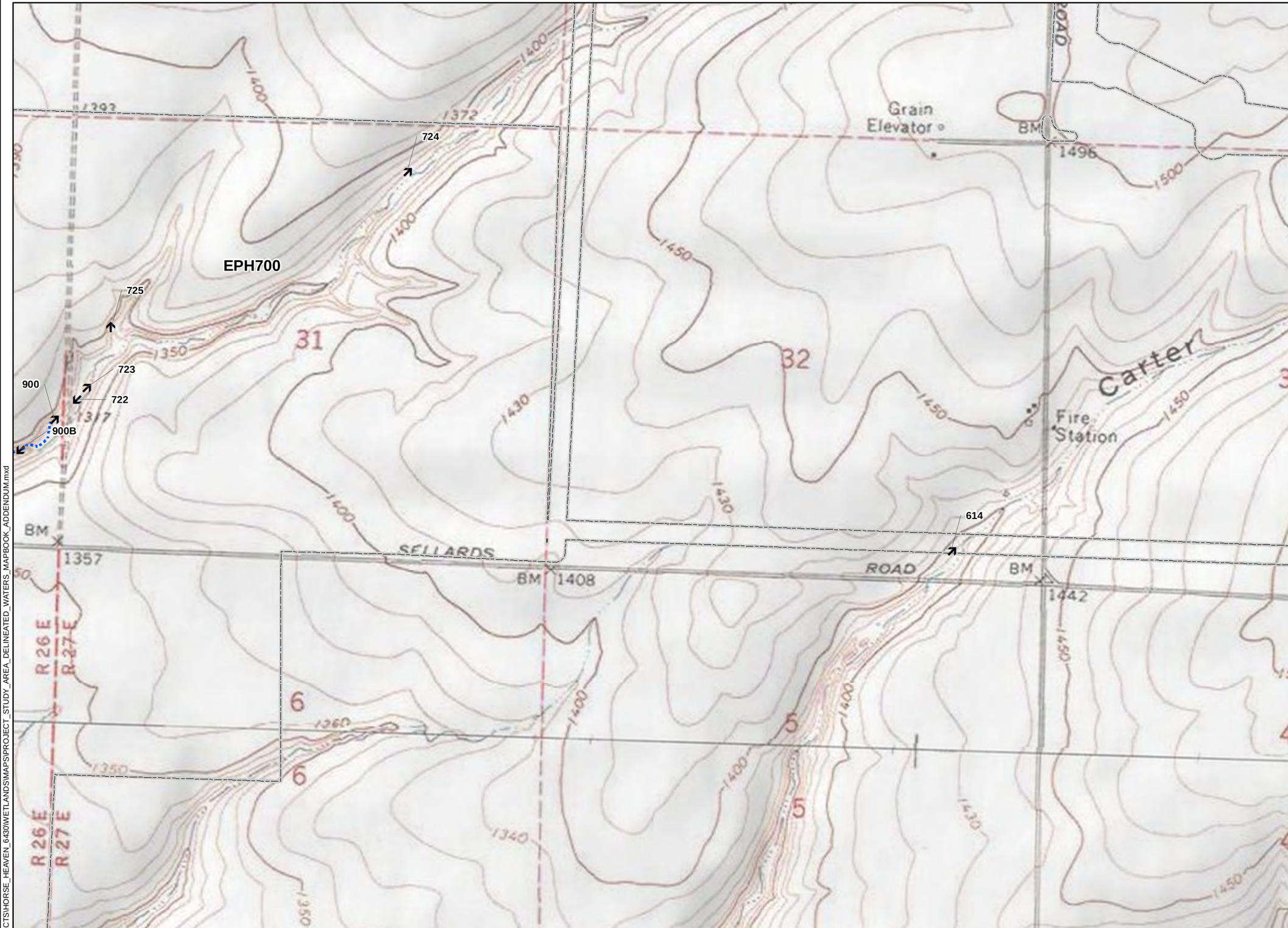


1:12,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

NOT FOR CONSTRUCTION

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDS\MAPS\PROJECT_STUDY_AREA_DELINEATED_WATERS_MAPBOOK_ADDENDUM.mxd



Horse Heaven Wind Project

SCOUT CLEAN ENERGY

Figure A-4
Field Delineated WOUS/WOS
Map 9 of 23

BENTON COUNTY, WA

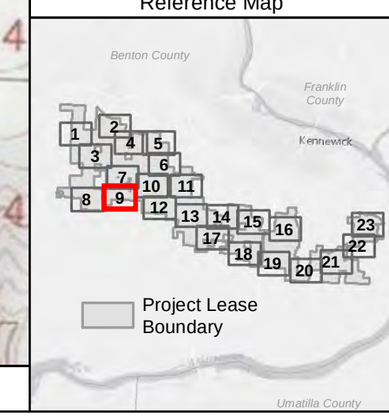
Project Study Area Boundary

Photo Point Location w/Direction

Ephemeral Stream

TETRA TECH

Reference Map



1:12,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

NOT FOR CONSTRUCTION

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDS\MAPS\PROJECT_STUDY_AREA_DELINEATED_WATERS_MAPBOOK_ADDENDUM.mxd

Horse Heaven Wind Project

SCOUT CLEAN ENERGY

Figure A-4
Field Delineated WOUS/WOS
Map 10 of 23

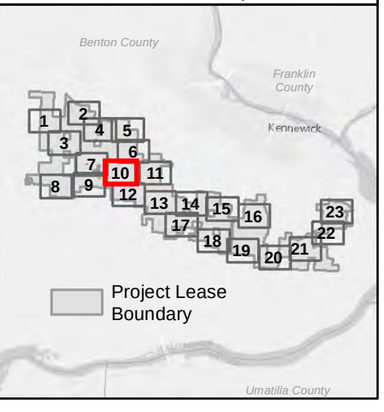
BENTON COUNTY, WA

Project Study Area Boundary

Photo Point Location w/Direction

TETRA TECH

Reference Map



1:12,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

NOT FOR CONSTRUCTION

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDS\MAPS\PROJECT_STUDY_AREA_DELINEATED_WATERS_MAPBOOK_ADDENDUM.mxd

Horse Heaven Wind Project

SCOUT CLEAN ENERGY

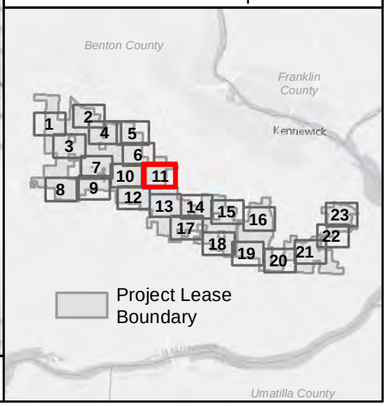
Figure A-4
Field Delineated WOUS/WOS
Map 11 of 23

BENTON COUNTY, WA

- Project Study Area Boundary
- Photo Point Location w/Direction
- Sample Site
- Ephemeral Stream
- Wetland

TETRA TECH

Reference Map

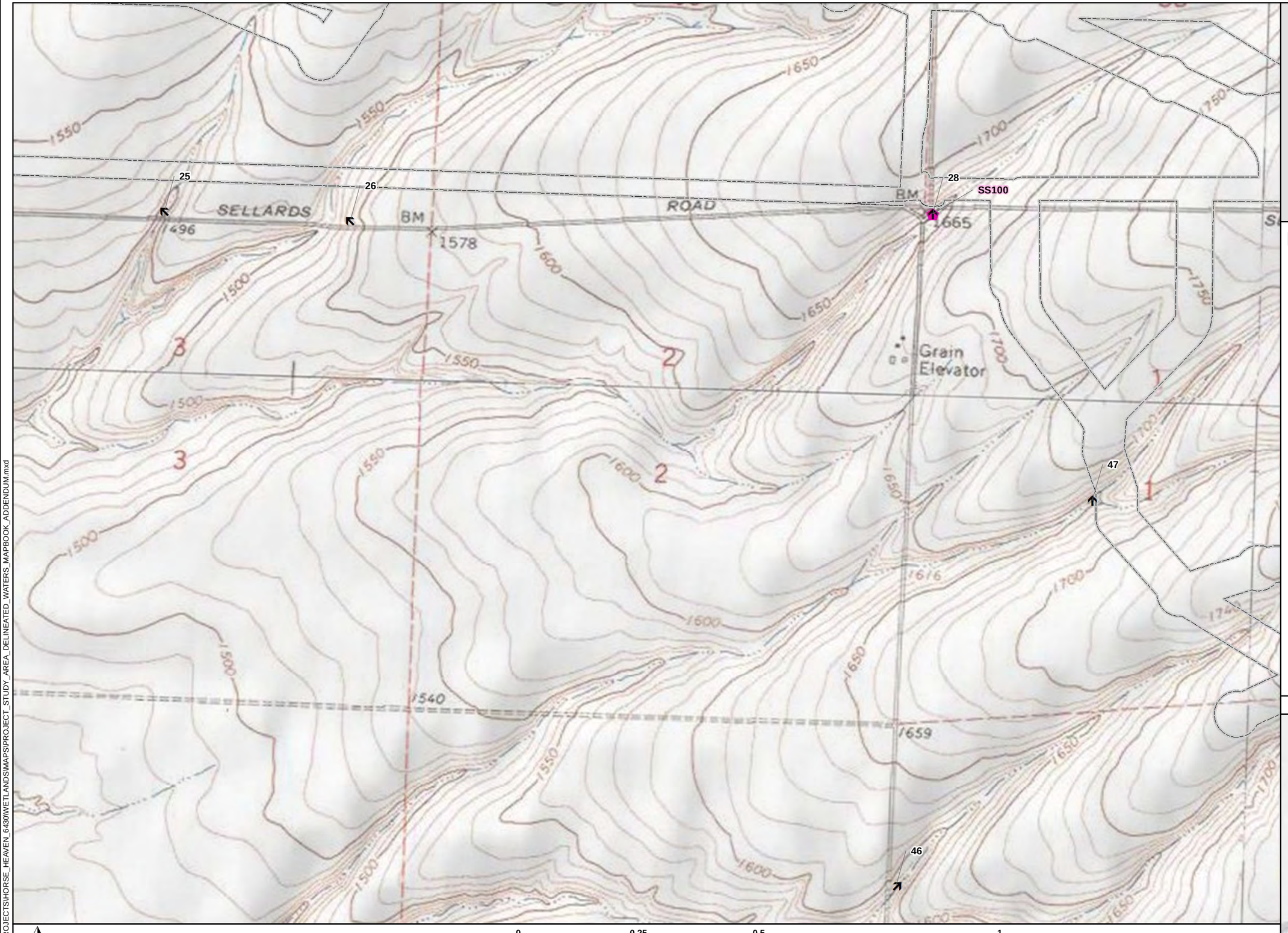


1:12,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

NOT FOR CONSTRUCTION

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDS\MAPS\PROJECT_STUDY_AREA_DELINEATED_WATERS_MAPBOOK_ADDENDUM.mxd



Horse Heaven Wind Project

SCOUT CLEAN ENERGY

Figure A-4
Field Delineated WOUS/WOS
Map 12 of 23

BENTON COUNTY, WA

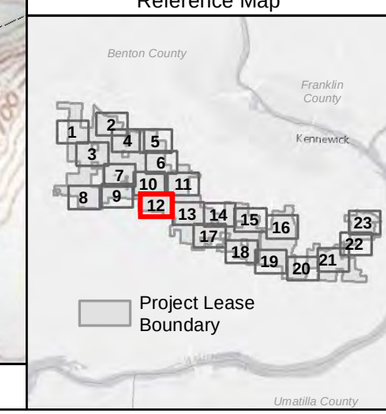
Project Study Area Boundary

Photo Point Location w/Direction

Sample Site

TETRA TECH

Reference Map

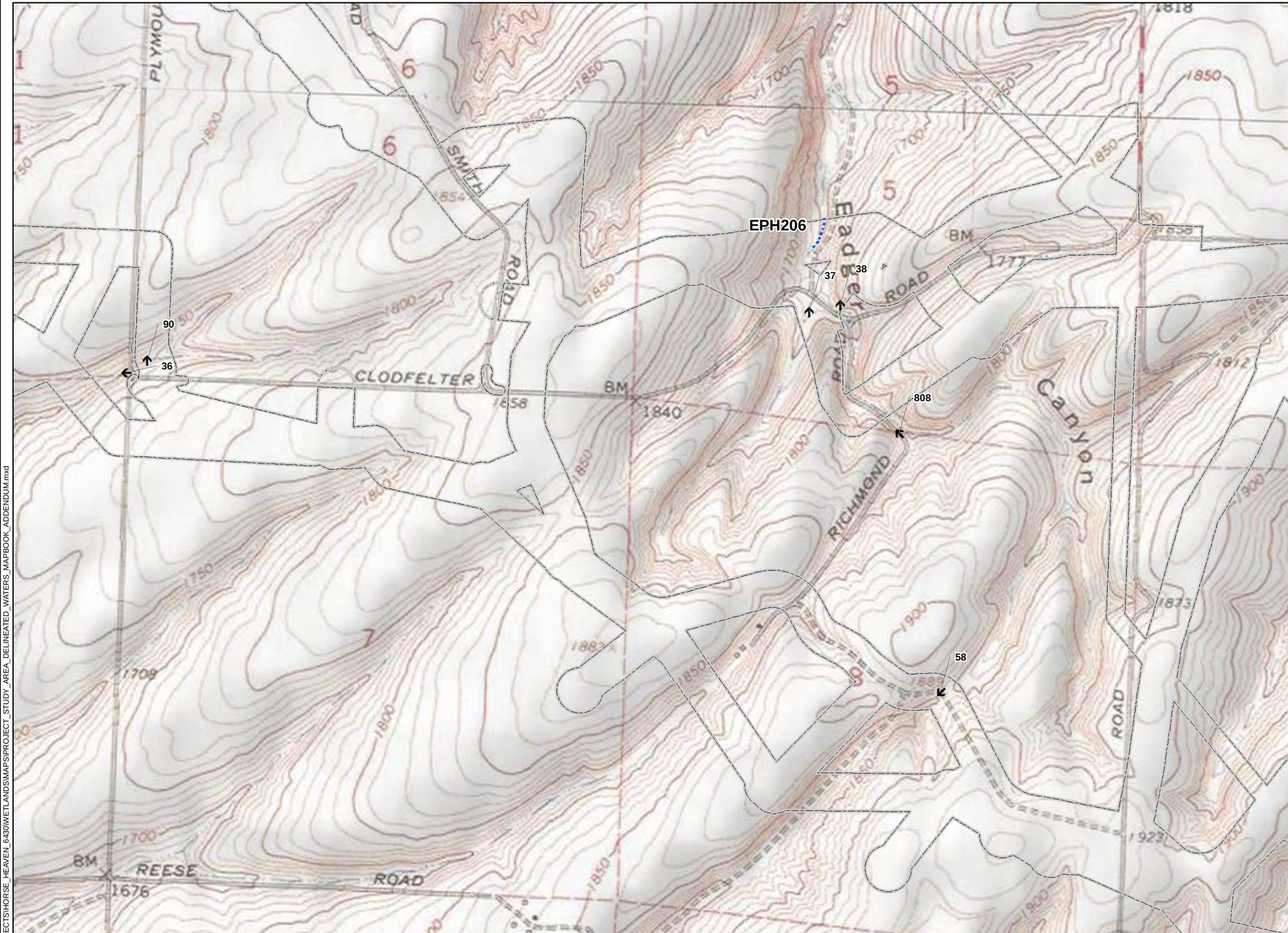


1:12,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

NOT FOR CONSTRUCTION

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDS\MAPS\PROJECT_STUDY_AREA_DELINEATED_WATERS_MAPBOOK_ADDENDUM.mxd



Horse Heaven Wind Project

SCOUT CLEAN ENERGY

Figure A-4
Field Delineated WOUS/WOS
Map 13 of 23

BENTON COUNTY, WA

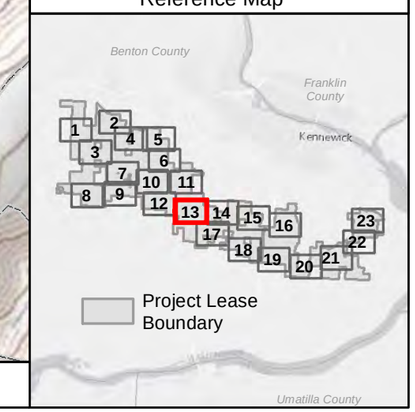
Project Study Area Boundary

Photo Point Location w/Direction

Ephemeral Stream

TETRA TECH

Reference Map



1:12,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

NOT FOR CONSTRUCTION

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDS\MAPS\PROJECT_STUDY_AREA_DELINEATED_WATERS_MAPBOOK_ADDENDUM.mxd

Horse Heaven Wind Project

SCOUT CLEAN ENERGY

Figure A-4
Field Delineated WOUS/WOS
Map 14 of 23

BENTON COUNTY, WA

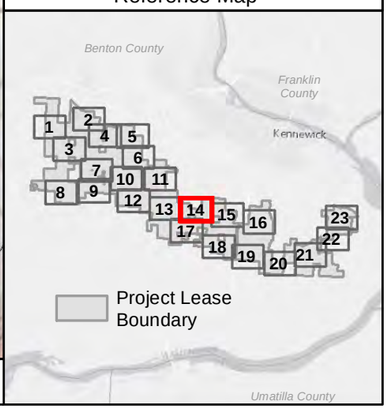
Project Study Area Boundary

Photo Point Location w/Direction

Ephemeral Stream

TETRA TECH

Reference Map



EPH305

62

63

XBB-301

XBB-302

XBB-303

1:12,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

NOT FOR CONSTRUCTION

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDS\MAPS\PROJECT_STUDY_AREA_DELINEATED_WATERS_MAPBOOK_ADDENDUM.mxd

Horse Heaven Wind Project

SCOUT CLEAN ENERGY

Figure A-4
Field Delineated WOUS/WOS
Map 15 of 23

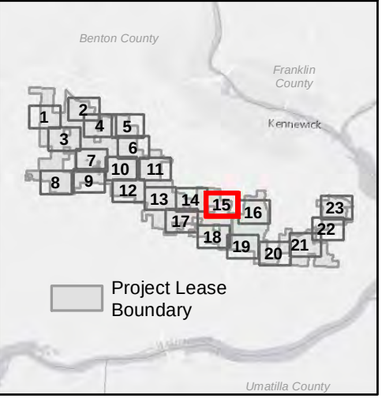
BENTON COUNTY, WA

Project Study Area Boundary

Photo Point Location w/Direction

TETRA TECH

Reference Map



XBB-304

XBB-305

XBB-306

64

65

66

PIPELINE

JEEP TRAIL

1:12,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

NOT FOR CONSTRUCTION

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDSMAPS\PROJECT_STUDY_AREA_DELINEATED_WATERS_MAPBOOK_ADDENDUM.mxd

Horse Heaven Wind Project

SCOUT CLEAN ENERGY

Figure A-4
Field Delineated WOUS/WOS
Map 16 of 23

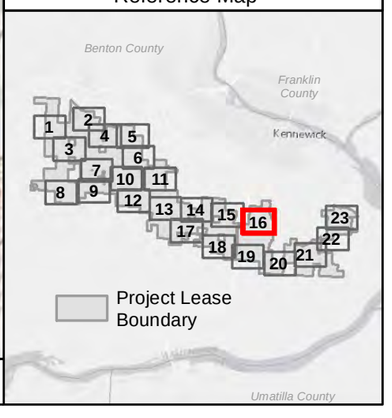
BENTON COUNTY, WA

Project Study Area Boundary

Photo Point Location w/Direction

TETRA TECH

Reference Map



1:12,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

NOT FOR CONSTRUCTION

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDSMAPS\PROJECT_STUDY_AREA_DELINEATED_WATERS_MAPBOOK_ADDENDUM.mxd

Horse Heaven Wind Project

SCOUT CLEAN ENERGY

Figure A-4
Field Delineated WOUS/WOS
Map 17 of 23

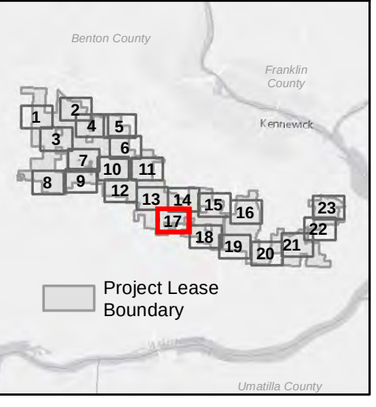
BENTON COUNTY, WA

Project Study Area Boundary

Photo Point Location w/Direction

TETRA TECH

Reference Map



1:12,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

NOT FOR CONSTRUCTION

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDSMAPS\PROJECT_STUDY_AREA_DELINEATED_WATERS_MAPBOOK_ADDENDUM.mxd

Horse Heaven Wind Project

SCOUT CLEAN ENERGY

Figure A-4
Field Delineated WOUS/WOS
Map 18 of 23

BENTON COUNTY, WA

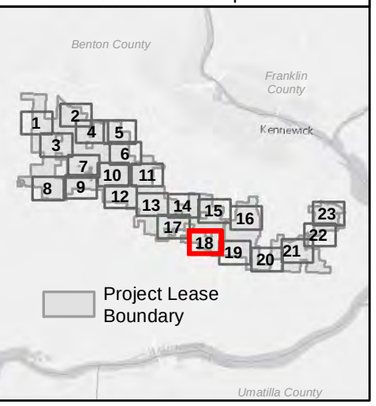
Project Study Area Boundary

Photo Point Location w/Direction

Ephemeral Stream

TETRA TECH

Reference Map



55
67
68
608
607
606
EPH600
PIPELINE
TRAIL
Canyon
Prospect
Well
BM
23
24
25
26
30
19
56

1:12,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

NOT FOR CONSTRUCTION

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDS\MAPS\PROJECT_STUDY_AREA_DELINEATED_WATERS_MAPBOOK_ADDENDUM.mxd

Horse Heaven Wind Project

SCOUT CLEAN ENERGY

Figure A-4
Field Delineated WOUS/WOS
Map 19 of 23

BENTON COUNTY, WA

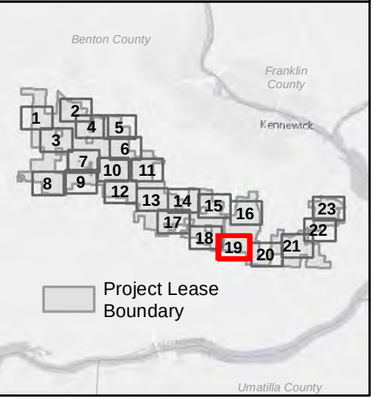
Project Study Area Boundary

Photo Point Location w/Direction

Ephemeral Stream

TETRA TECH

Reference Map



1:12,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

NOT FOR CONSTRUCTION

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDSMAPS\PROJECT_STUDY_AREA_DELINEATED_WATERS_MAPBOOK_ADDENDUM.mxd

Horse Heaven Wind Project

SCOUT CLEAN ENERGY

Figure A-4
Field Delineated WOUS/WOS
Map 20 of 23

BENTON COUNTY, WA

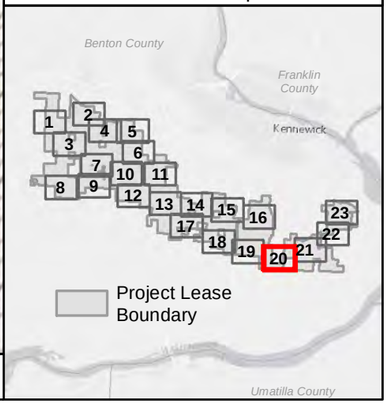
Project Study Area Boundary

Photo Point Location w/Direction

Ephemeral Stream

TETRA TECH

Reference Map



1:12,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

NOT FOR CONSTRUCTION

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDS\MAPS\PROJECT_STUDY_AREA_DELINEATED_WATERS_MAPBOOK_ADDENDUM.mxd

Horse Heaven Wind Project

SCOUT CLEAN ENERGY

Figure A-4
Field Delineated WOUS/WOS
Map 21 of 23

BENTON COUNTY, WA

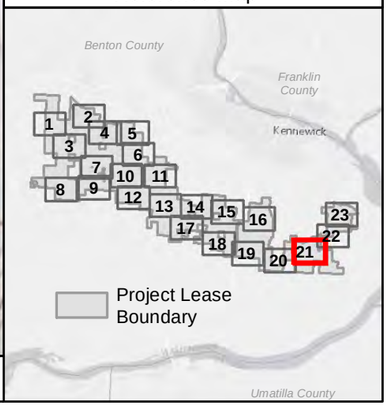
Project Study Area Boundary

Photo Point Location w/Direction

Sample Site

TETRA TECH

Reference Map



1:12,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

NOT FOR CONSTRUCTION

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDS\MAPS\PROJECT_STUDY_AREA_DELINEATED_WATERS_MAPBOOK_ADDENDUM.mxd

Horse Heaven Wind Project

SCOUT CLEAN ENERGY

Figure A-4
Field Delineated WOUS/WOS
Map 22 of 23

BENTON COUNTY, WA

EPH302

802

102

- Project Study Area Boundary
- Photo Point Location w/Direction
- Ephemeral Stream

TETRA TECH

Reference Map



1:12,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

NOT FOR CONSTRUCTION

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDS\MAPS\PROJECT_STUDY_AREA_DELINEATED_WATERS_MAPBOOK_ADDENDUM.mxd

Horse Heaven Wind Project

SCOUT CLEAN ENERGY

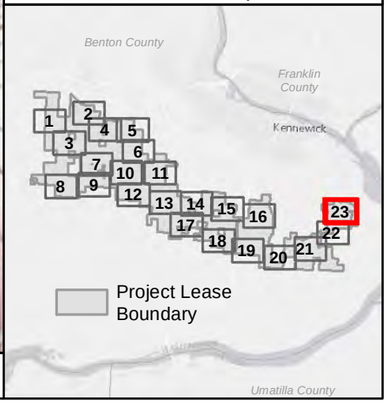
Figure A-4
Field Delineated WOUS/WOS
Map 23 of 23

BENTON COUNTY, WA

- Project Study Area Boundary
- Photo Point Location w/Direction
- Sample Site
- Ephemeral Stream
- Intermittent Stream

TETRA TECH

Reference Map



SS02
INT02
EPH411
EPH412
EPH413
EPH300
EPH301
XBB-310
86
87
88
89
107
108
109
110
111
112
113
114
115
52
53
54

1:12,000 WGS 1984 UTM Zone 11N

0 0.25 0.5 1 Miles

NOT FOR CONSTRUCTION

R:\PROJECTS\HORSE_HEAVEN_6430\WETLANDS\MAPS\PROJECT_STUDY_AREA_DELINEATED_WATERS_MAPBOOK_ADDENDUM.mxd

APPENDIX B
USACE DATA SHEETS

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Arid West Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-xxxx, Exp: Pending
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Horse Heaven Hills City/County: Benton County Sampling Date: 5/11/21

Applicant/Owner: Horse Heaven Hills, LLC State: OR Sampling Point: E10u

Investigator(s): Jessica Taylor Section, Township, Range: Section 31, T07N, R30E

Landform (hillside, terrace, etc.): valley Local relief (concave, convex, none): Slope Slope (%): 30-65

Subregion (LRR): LRR B Lat: 46.140656 Long: -119.349764 Datum: UTM11

Soil Map Unit Name: Ritzville Silt Loam, 30-65 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
This site is in a valley bottom. There is a spring with a well in it underneath a tree (visible in Google Earth orthoimagery). Historical photos, also on Google Earth imagery, show the area with a livestock watering trough and cattle onsite.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ =Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ =Total Cover		
Herb Stratum (Plot size: 15 feet)			
1. *Leymus cinereus*	100	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	100 =Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ =Total Cover		

% Bare Ground in Herb Stratum 30 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	100	x 3 =	300
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		300 (B)

Prevalence Index = B/A = 3.00

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:

SOIL

Sampling Point: E10u

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR 3/3	100					Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Iron-Manganese Masses (F12) **(LRR D)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

Soils match what has typically been found on this side of the project area in dryland areas.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? Yes ___ No X Depth (inches): ___

(includes capillary fringe)

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Arid West Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-xxxx, Exp: Pending
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Horse Heaven Hills | City/County: Benton County | Sampling Date: 5/11/21
Applicant/Owner: Horse Heaven Hills, LLC | State: OR | Sampling Point: E10w
Investigator(s): Jessica Taylor | Section, Township, Range: Section 31, T07N, R30E
Landform (hillside, terrace, etc.): valley | Local relief (concave, convex, none): concave | Slope (%): 30
Subregion (LRR): LRR B | Lat: 46.140656 | Long: -119.349764 | Datum: UTM11
Soil Map Unit Name: Ritzville Silt Loam, 30-65 percent slopes | NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ____
Hydric Soil Present? Yes X No ____
Wetland Hydrology Present? Yes X No ____

Is the Sampled Area within a Wetland? **Yes** X **No** ____

Remarks:
This site is in a valley bottom. There is a spring with a well in it underneath a tree (visible in Google Earth orthoimagery). Historical photos, also on Google Earth imagery, show the area with a livestock watering trough and cattle onsite.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 15)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus balsamifera*	45	Yes	FAC
2.			
3.			
4.			
	45	=Total Cover	
Sapling/Shrub Stratum (Plot size: 30 feet)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
Herb Stratum (Plot size: 15 feet)			
1. *Leymus cinereus*	10	No	FAC
2. *Equisetum arvense*	90	Yes	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	100	=Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		=Total Cover	

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	145	x 3 =	435
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	145 (A)		435 (B)

Prevalence Index = B/A = 3.00

Hydrophytic Vegetation Indicators:
X Dominance Test is >50%
X Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** x

Remarks:
Vegetation is not currently being grazed by cattle, the stand of Great Basin Wildrye was very dense around the edges of the wetland.

SOIL

Sampling Point: E10w

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/2	100					Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- X Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Iron-Manganese Masses (F12) **(LRR D)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: bedrock

Depth (inches): 12

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Soils had a slight hydrogen sulfide smell and felt mucky.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- X Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No x	Depth (inches): ___
Water Table Present?	Yes ___	No x	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Arid West Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-xxxx, Exp: Pending
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Horse Heaven Hills City/County: Benton County Sampling Date: 5/11/21

Applicant/Owner: Horse Heaven Hills, LLC State: OR Sampling Point: E18

Investigator(s): Jessica Taylor Section, Township, Range: Section 31, T07N, R30E

Landform (hillside, terrace, etc.): wide valley bottom Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR): LRR B Lat: 46.055728 Long: -119.079240 Datum: UTM11

Soil Map Unit Name: Ritzville Silt Loam, 0-5 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
This site is at the toe slope of a cropfield. The entire site was covered in cerealy rye, a common weed in this region. Cereal rye shows up as a light blonde on orthoimagery.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ =Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ =Total Cover		
Herb Stratum (Plot size: 15 feet)			
1. *Secale cereale*	100	Yes	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	100 =Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ =Total Cover		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	100	x 5 =	500
Column Totals:	100 (A)		500 (B)

Prevalence Index = B/A = 5.00

Hydrophytic Vegetation Indicators:

____ Dominance Test is >50%

____ Prevalence Index is ≤3.0[1]

____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks:

SOIL

Sampling Point: E18

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/3	100					Silt Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Iron-Manganese Masses (F12) **(LRR D)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

Soils match what has typically been found on this side of the project area in dryland areas.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? Yes ___ No X Depth (inches): ___

(includes capillary fringe)

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Arid West Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-xxxx, Exp: Pending
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Horse Heaven Hills City/County: Benton County Sampling Date: 2/19/2020

Applicant/Owner: Horse Heaven Hills, LLC State: OR Sampling Point: 01

Investigator(s): Jessica Taylor/Katie Pyne Section, Township, Range: Section 01, T07N, R27E

Landform (hillside, terrace, etc.): swale Local relief (concave, convex, none): concave Slope (%): 20

Subregion (LRR): LRR B Lat: 46.130370 Long: -116.390489 Datum: NAD83

Soil Map Unit Name: Ritzville Silt Loam NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ____ (If no, explain in Remarks.)

Are Vegetation x , Soil ____ , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No ____

Are Vegetation ____ , Soil ____ , or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
Site is in a low spot adjacent to an intersection. Two culverts are present and the soil surface was cracked. The only vegetation was sparse winter wheat that was part of a larger crop.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ =Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ =Total Cover		
Herb Stratum (Plot size: 30 feet)			
1. *Triticum aestivum*	20	Yes	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	20 =Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ =Total Cover		

% Bare Ground in Herb Stratum 80 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	20	x 5 =	100
Column Totals:	20 (A)		100 (B)

Prevalence Index = B/A = 5.00

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks:

SOIL

Sampling Point: 01

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-15	10YR 3/4	100					Loamy/Clayey	Silt Loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Iron-Manganese Masses (F12) **(LRR D)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- x Drift Deposits (B3) **(Nonriverine)**
- x Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No x	Depth (inches): ___
Water Table Present?	Yes ___	No x	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No x	Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Arid West Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-xxxx, Exp: Pending
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Horse Heaven Hills | City/County: Benton County | Sampling Date: 2/22/2020
Applicant/Owner: Horse Heaven Hills, LLC | State: OR | Sampling Point: 02
Investigator(s): Jessica Taylor/Katie Pyne | Section, Township, Range: Section 11, T07N, R30E
Landform (hillside, terrace, etc.): valley | Local relief (concave, convex, none): concave | Slope (%): 30-65
Subregion (LRR): LRR B | Lat: 46.114251 | Long: -119.052036 | Datum: NAD83
Soil Map Unit Name: Warden Silt Loam, 30-65 percent slopes | NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ____ No x
Hydric Soil Present? Yes ____ No X
Wetland Hydrology Present? Yes ____ No X

Is the Sampled Area within a Wetland? **Yes** ____ **No** X

Remarks:
Bottom of steep canyon in a thin channel with very obvious bed and banks but lined with sagebrush at the bank's edge. Lomatium was blooming but other potential herbaceous species were not up yet. There had been recent flooding in the area and it was a warmer than usual winter.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
	____ =Total Cover		
Sapling/Shrub Stratum (Plot size: 30 feet)			
1. *Artemisia tridentata*	75	Yes	UPL
2.			
3.			
4.			
5.			
	75 =Total Cover		
Herb Stratum (Plot size: 15 feet)			
1. *Lomatium triternatum*	5	No	UPL
2. *Moss*	90	Yes	
3.			
4.			
5.			
6.			
7.			
8.			
	95 =Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ =Total Cover		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	80	x 5 =	400
Column Totals:	80 (A)		400 (B)

Prevalence Index = B/A = 5.00

Hydrophytic Vegetation Indicators:
____ Dominance Test is >50%
____ Prevalence Index is ≤3.0[1]
____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** x

Remarks:
Potential for more vegetation later in the season.

SOIL

Sampling Point: 02

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 4/4	100					Sandy	Sandy Loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Iron-Manganese Masses (F12) **(LRR D)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: bedrock

Depth (inches): 4

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- x Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No x Depth (inches): ___

Water Table Present? Yes ___ No x Depth (inches): ___

Saturation Present? Yes ___ No x Depth (inches): ___

(includes capillary fringe)

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland name or number_____

RATING SUMMARY – Eastern Washington

Name of wetland (or ID #): E-10 Date of site visit: 5/11/21

Rated by Jessica Taylor Trained by Ecology? __ Yes __X__ No Date of training_____

HGM Class used for rating Depressional Wetland has multiple HGM classes?____Y __X__N

NOTE: **Form is not complete without the figures requested** (*figures can be combined*).
Source of base aerial photo/map _____

OVERALL WETLAND CATEGORY ____IV____ (based on functions__X__ or special characteristics___)

1. Category of wetland based on FUNCTIONS

_____**Category I** – Total score = 22-27

_____**Category II** – Total score = 19-21

_____**Category III** – Total score = 16-18

__X__**Category IV** – Total score = 9-15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	Circle the appropriate ratings			
Site Potential	H M **L**	H **M** L	H M **L**	
Landscape Potential	H **M** L	H **M** L	H **M** L	
Value	H M **L**	H M **L**	H **M** L	**TOTAL**
Score Based on Ratings	4	5	5	14

Score for each function based on three ratings *(order of ratings is not important)*

9 = H,H,H
8 = H,H,M
7 = H,H,L
7 = H,M,M
6 = H,M,L
6 = M,M,M
5 = H,L,L
5 = M,M,L
4 = M,L,L
3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY *Circle the appropriate category*
Vernal Pools	**II** **III**
Alkali	**I**
Wetland of High Conservation Value	**I**
Bog and Calcareous Fens	**I**
Old Growth or Mature Forest – slow growing	**I**
Aspen Forest	**I**
Old Growth or Mature Forest – fast growing	**II**
Floodplain forest	**II**
None of the above	Not Applicable

Wetland name or number E10

Maps and figures required to answer questions correctly for Eastern Washington

Depressional Wetlands 0.03 acre depressional wetland in riverine system

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	D 1.3, H 1.1, H 1.5	N/A
Hydroperiods (including area of open water for H 1.3)	D 1.4, H 1.2, H 1.3	N/A
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	N/A
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	1
Map of the contributing basin	D 5.3	3
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	2
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	4
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	D 3.3	5

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.5	
Hydroperiods	H 1.2, H 1.3	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of wetland vs. width of stream *(can be added to another figure)*	R 4.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	L 1.1, L 4.1, H 1.1, H 1.5	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.5	
Hydroperiods	H 1.2, H 1.3	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above)*	S 4.1	
Boundary of area within 150 ft of the wetland (*can be added to another figure*)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	S 3.3	

Wetland name or number E10

HGM Classification of Wetland in Eastern Washington

For questions 1-4, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-4 apply, and go to Question 5.

1. Does the entire unit **meet both** of the following criteria?
   ___The vegetated part of the wetland is on the water side of the Ordinary High Water Mark of a body of permanent open water (without any plants on the surface) that is at least 20 ac (8 ha) in size
   ___At least 30% of the open water area is deeper than 10 ft (3 m)

   NO – go to 2 **YES –** The wetland class is **Lake Fringe** (Lacustrine Fringe)

2. Does the entire wetland unit **meet all** of the following criteria?
   _x_ The wetland is on a slope (*slope can be very gradual*),
   _x_ The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks;
   _x_ The water leaves the wetland **without being impounded**.

   NO - go to 3 YES – The wetland class is **Slope**
   NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 foot deep).

3. Does the entire wetland unit **meet all** of the following criteria?
   ___ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river;
   ___ The overbank flooding occurs at least once every 10 years.

   NO - go to 4 YES – The wetland class is **Riverine**
   NOTE: The Riverine wetland can contain depressions that are filled with water when the river is not flooding.

4. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

   NO – go to 5 YES - The wetland class is **Depressional**

5. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-4 APPLY TO DIFFERENT AREAS IN THE WETLAND UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

Wetland name or number E10

NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the wetland unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM Class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine (the riverine portion is within the boundary of depression)	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine

*If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.*

Wetland name or number E10

DEPRESSIONAL WETLANDS **Water Quality Functions** - Indicators that the site functions to improve water quality	Points (only 1 score per box)
D 1.0. Does the site have the potential to improve water quality?	
D 1.1. Characteristics of surface water outflows from the wetland: Wetland has no surface water outlet points = 5 Wetland has an intermittently flowing outlet points = 3 Wetland has a highly constricted permanently flowing outlet points = 3 Wetland has a permanently flowing, unconstricted, surface outlet points = 1	3
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic *(use NRCS definitions of soils)* YES = 3 NO = 0	0
D 1.3. Characteristics of persistent vegetation (Emergent, Scrub-shrub, and/or Forested Cowardin classes) Wetland has persistent, ungrazed, vegetation for > $^2/_3$ of area points = 5 Wetland has persistent, ungrazed, vegetation from $^1/_3$ to $^2/_3$ of area points = 3 Wetland has persistent, ungrazed vegetation from $^1/_{10}$ to < $^1/_3$ of area points = 1 Wetland has persistent, ungrazed vegetation < $^1/_{10}$ of area points = 0	0
D 1.4. Characteristics of seasonal ponding or inundation: Area is grazed and has livestock watering facility adjacent to wetlands *This is the area of ponding that fluctuates every year. Do not count the area that is permanently ponded.* Area seasonally ponded is > ½ total area of wetland points = 3 Area seasonally ponded is ¼ - ½ total area of wetland points = 1 Area seasonally ponded is < ¼ total area of wetland points = 0	0
Total for D 1 Add the points in the boxes above	3

Rating of Site Potential If score is: ___ **12- 16 = H** ___ **6- 11 = M** X **0- 5 = L** *Record the rating on the first page*

D 2.0. Does the landscape have the potential to support the water quality function of the site?	
D 2.1. Does the wetland receive stormwater discharges? Yes = 1 No = 0	0
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants? Yes = 1 No = 0	1 - agricultural
D 2.3. Are there septic systems within 250 ft of the wetland? Yes = 1 No = 0	0
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1- D 2.3? Source_____ Yes = 1 No = 0	0
Total for D 2 Add the points in the boxes above	1

Rating of Landscape Potential If score is: ___ **3 or 4 = H** X **1 or 2 = M** ___ **0 = L** *Record the rating on the first page*

D 3.0. Is the water quality improvement provided by the site valuable to society?	
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, or lake that is on the 303(d) list? Yes = 1 No = 0	0
D 3.2. Is the wetland in a basin or sub-basin where water quality is an issue in some aquatic resource [303(d) list, eutrophic lakes, problems with nuisance and toxic algae]? Yes = 1 No = 0	0
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality (*answer YES if there is a TMDL for the drainage or basin in which the wetland is found*)? Yes = 2 No = 0	0
Total for D 3 Add the points in the boxes above	0

Rating of Value If score is: ___ **2-4 = H** ___ **1 = M** X **0 = L** *Record the rating on the first page*

Wetland name or number E10

DEPRESSIONAL WETLANDS **Hydrologic Functions** - Indicators that the site functions to reduce flooding and erosion.	Points (only 1 score per box)
D 4.0. Does the site have the potential to reduce flooding and erosion?	
D 4.1. Characteristics of surface water outflows from the wetland: Wetland has no surface water outlet points = 8 Wetland has an intermittently flowing outlet points = 4 Wetland has a highly constricted permanently flowing outlet points = 4 Wetland has a permanently flowing unconstricted surface outlet points = 0 *(If outlet is a ditch and not permanently flowing treat wetland as "intermittently flowing")*	4
D 4.2. Depth of storage during wet periods: *Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or deepest part (if dry).* Seasonal ponding: > 3 ft above the lowest point in wetland or the surface of permanent ponding points = 8 Seasonal ponding: 2 ft - < 3 ft above the lowest point in wetland or the surface of permanent ponding points = 6 The wetland is a headwater wetland points = 4 Seasonal ponding: 1 ft - < 2 ft points = 4 Seasonal ponding: 6 in - < 1 ft points = 2 Seasonal ponding: < 6 in or wetland has only saturated soils points = 0	2
Total for D 4 Add the points in the boxes above	6

Rating of Site Potential If score is: ___ **12-16 = H** _x_ **6-11 = M** ___ **0-5 = L** *Record the rating on the first page*

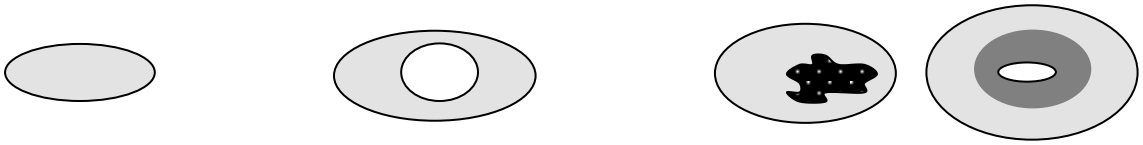
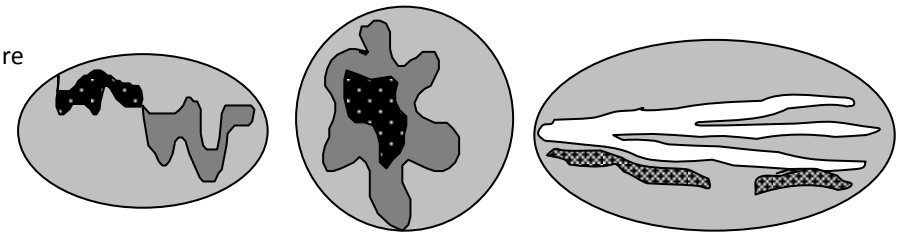
D 5.0. Does the landscape have the potential to support the hydrologic functions of the site?	
D 5.1. Does the wetland receive stormwater discharges? Yes = 1 No = 0	0
D 5.2. Is > 10% of the area within 150 ft of the wetland in a land use that generates runoff? Yes = 1 No = 0	0 -ephemeral stream
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses? Yes = 1 No = 0	1 - agricultural
Total for D 5 Add the points in the boxes above	1

Rating of Landscape Potential If score is: ___ **3 = H** _x_ **1 or 2 = M** ___ **0 = L** *Record the rating on the first page*

D 6.0. Are the hydrologic functions provided by the site valuable to society?	
D 6.1. The wetland is in a landscape that has flooding problems. Choose the description that best matches conditions around the wetland being rated. *Do not add points. Choose the highest score if more than one condition is met.* The wetland captures surface water that would otherwise flow down-gradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds), AND Flooding occurs in sub-basin that is immediately down-gradient of wetland points = 2 Surface flooding problems are in a sub-basin farther down-gradient points = 1 The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. *Explain why* _____ points = 0 There are no problems with flooding downstream of the wetland Area is very dry, no flooding points = 0	0
D 6.2. Has the site has been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	0
Total for D 6 Add the points in the boxes above	0

Rating of Value If score is: ___ **2-4 = H** ___ **1 = M** _x_ **0 = L** *Record the rating on the first page*

Wetland name or number E10

These questions apply to wetlands of all HGM classes. **HABITAT FUNCTIONS** - Indicators that site functions to provide important habitat	(only 1 score per box)
H 1.0. Does the wetland have the potential to provide habitat for many species?	
H 1.1. Structure of the plant community: *Check the Cowardin vegetation classes present and categories of emergent plants. Size threshold for each category is >= ¼ ac or >= 10% of the wetland if wetland is < 2.5 ac.* ____Aquatic bed ____Emergent plants 0-12 in (0-30 cm) high are the highest layer and have > 30% cover ____Emergent plants >12-40 in (>30-100 cm) high are the highest layer with >30% cover ____Emergent plants > 40 in (> 100 cm) high are the highest layer with >30% cover ____Scrub-shrub (areas where shrubs have >30% cover) 4 or more checks: points = 3 _X_Forested (areas where trees have >30% cover) 3 checks: points = 2 Wetland is small and the one cottonwood covers the entire area. Less than 10% equisetum. 2 checks: points = 1 1 check: points = 0	0
H 1.2. Is one of the vegetation types Aquatic Bed? Yes = 1 No = 0	0
H 1.3. Surface water H 1.3.1. Does the wetland have areas of open water (without emergent or shrub plants) over at least ¼ ac **OR** 10% of its area during the March to early June **OR** in August to the end of September? ***Answer YES for Lake Fringe wetlands.*** Yes = 3 points & go to H 1.4 No = go to H 1.3.2 H 1.3.2. Does the wetland have an intermittent or permanent, and unvegetated stream within its boundaries, or along one side, over at least ¼ ac or 10% of its area? *Answer yes only if H 1.3.1 is No.* Yes = 3 No = 0	0
H 1.4. Richness of plant species Count the number of plant species in the wetland that cover at least 10 ft^2. D*ifferent patches of the same species can be combined to meet the size threshold. You do not have to name the species.* *Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Russian olive, Phragmites, Canadian thistle, yellow-flag iris, and saltcedar (Tamarisk)* # of species 3 Scoring: > 9 species: points = 2 4-9 species: points = 1 < 4 species: points = 0	0
H 1.5. Interspersion of habitats Decide from the diagrams below whether interspersion among types of plant structures (described in H 1.1), and unvegetated areas (open water or mudflats) is high, moderate, low, or none. *Use map of Cowardin and emergent plant classes prepared for questions H 1.1 and map of open water from H 1.3. If you have four or more plant classes or three classes and open water, the rating is always high.*  **None** = 0 points **Low** = 1 point **Moderate** = 2 points All three diagrams in this row are **High** = 3 points  No open water, only one emergent plant species. Riparian braided channels with 2 classes	Figure__ 1

Wetland has a well and pump in it that is used by house directly to the SW for all of their drinking water.

Wetland name or number E10

H 1.6. Special habitat features *Check the habitat features that are present in the wetland. The number of checks is the number of points.* ____Loose rocks larger than 4 in OR large, downed, woody debris (> 4 in diameter) within the area of surface ponding or in stream. ____Cattails or bulrushes are present within the wetland. ____Standing snags (diameter at the bottom > 4 in) in the wetland or within 30 m (100 ft) of the edge. ____Emergent or shrub vegetation in areas that are permanently inundated/ponded. ____Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 45 degree slope) OR signs of recent beaver activity X ____ Invasive species cover less than 20% in each stratum of vegetation *(canopy, sub-canopy, shrubs, herbaceous, moss/ground cover)*	1
Total for H 1 — Add the points in the boxes above	2

Rating of Site Potential If score is: ___**15-18 = H** ___**7-14 = M** X **0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support habitat functions of the site?	
H 2.1. Accessible habitat (only area of habitat abutting wetland). If total accessible habitat is: *Calculate:* % undisturbed habitat 0 **+** [(% moderate and low intensity land uses)/2] 25 **=** 25 % > 1/3 (33.3%) of 1 km Polygon — points = 3 20-33% of 1km Polygon — points = 2 10-19% of 1km Polygon — points = 1 <10% of 1km Polygon Cattle have free access to this wetland and have watering trough adjacent. — points = 0	2
H 2.2. Undisturbed habitat in 1 km Polygon around wetland. *Calculate:* % undisturbed habitat 0 **+** [(% moderate and low intensity land uses)/2] 50 **=** 50 % Undisturbed habitat > 50% of Polygon — points = 3 Undisturbed habitat 10 - 50% and in 1-3 patches Cattle have free range of site but stick close to wetland/trough — points = 2 Undisturbed habitat 10 - 50% and > 3 patches — points = 1 Undisturbed habitat < 10% of Polygon — points = 0	2
H 2.3. Land use intensity in 1 km Polygon: > 50% of Polygon is high intensity land use Wheat crop is majority of polygon — points = (- 2) Does not meet criterion above — points = 0	-2
H 2.4. The wetland is in an area where annual rainfall is less than 12 in, and its water regime is not influenced by irrigation practices, dams, or water control structures. *Generally, this means outside boundaries of reclamation areas, irrigation districts, or reservoirs* — Yes = 3 No = 0	0
Total for H 2 Wetland is uphill from floodplain for dammed Columbia River and irrigation canal — Add the points in the boxes above	2

Rating of Landscape Potential If score is: ___**4-9 = H** X **1-3 = M** ___**< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose the highest score that applies to the wetland being rated* Site meets ANY of the following criteria: — points = 2 — It has 3 or more priority habitats within 100 m (see Appendix B) — It provides habitat for Threatened or Endangered species (any plant or animal on state or federal lists) — It is mapped as a location for an individual WDFW species — It is a Wetland of High Conservation Value as determined by the Department of Natural Resources — It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan X Site has 1 or 2 priority habitats within 100 m (see Appendix B) — points = 1 Site does not meet any of the criteria above — points = 0	1

Rating of Value If score is: ___**2 = H** X **1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number_____

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate category. NOTE: A wetland may meet the criteria for more than one set of special characteristics. Record all those that apply. NOTE: All wetlands should also be characterized based on their functions.

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Vernal pools Is the wetland **less than 4000 ft²**, and does it meet at least **two** of the following criteria? — Its only source of water is rainfall or snowmelt from a small contributing basin and has no groundwater input. — Wetland plants are typically present only in the spring; the summer vegetation is typically upland annuals. *If you find perennial, obligate, wetland plants, the wetland is probably NOT a vernal pool*. — The soil in the wetland is shallow [< 1 ft (30 cm)deep] and is underlain by an impermeable layer such as basalt or clay. — Surface water is present for less than 120 days during the wet season. Yes **–** Go to **SC 1.1** No = **Not a vernal pool** SC 1.1. Is the vernal pool relatively undisturbed in February and March? Yes **–** Go to **SC 1.2** No = **Not a vernal pool with special characteristics**	No
SC 1.2. Is the vernal pool in an area where there are at least 3 separate aquatic resources within 0.5 mi (other wetlands, rivers, lakes etc.)? Yes = **Category II** No = **Category III**	**Cat. II** **Cat. III**
SC 2.0. Alkali wetlands Does the wetland meet **one** of the following criteria? — The wetland has a conductivity > 3.0 mS/cm. — The wetland has a conductivity between 2.0 and 3.0 mS, and more than 50% of the plant cover in the wetland can be classified as "alkali" species (see Table 4 for list of plants found in alkali systems). — If the wetland is dry at the time of your field visit, the central part of the area is covered with a layer of salt. **OR** does the wetland unit meet two of the following three sub-criteria? — Salt encrustations around more than 75% of the edge of the wetland — More than ¾ of the plant cover consists of species listed on Table 4 — A pH above 9.0. All alkali wetlands have a high pH, but please note that some freshwater wetlands may also have a high pH. Thus, pH alone is not a good indicator of alkali wetlands. Yes = **Category I** No = **Not an alkali wetland**	No **Cat. I**
SC 3.0. Wetlands of High Conservation Value (WHCV) SC 3.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? Yes – Go to **SC 3.2** No – Go to **SC 3.3** SC 3.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes = **Category I** No = **Not a WHCV** SC 3.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf Yes **– Contact WNHP/WDNR and go to SC 3.4** No = **Not a WHCV** SC 3.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and it is listed on their website? Yes = **Category I** No = **Not a WHCV**	No **Cat. I**

Wetland name or number_____

SC 4.0 Bogs and Calcareous Fens Does the wetland (or any part of the wetland unit) meet both the criteria for soils and vegetation in bogs or calcareous fens? *Use the key below to identify if the wetland is a bog or calcareous fen.* ***If you answer yes you will still need to rate the wetland based on its functions.*** SC 4.1. Does an area within the wetland have organic soil horizons (i.e., layers of organic soil), either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? *See Appendix C for a field key to identify organic soils*. Yes – Go to **SC 4.3** No – Go to **SC 4.2** SC 4.2. Does an area within the wetland have organic soils, either peats or mucks, that are less than 16 in deep over bedrock or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes – Go to **SC 4.3** No = **Is not a bog for rating** SC 4.3. Does an area within the wetland have more than 70% cover of mosses at ground level AND at least 30% of the total plant cover consists of species in Table 5? Yes = **Category I bog** No – Go to **SC 4.4** **NOTE:** If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 5 are present, the wetland is a bog. SC 4.4. Is an area with peats or mucks forested (> 30% cover) with subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 5 provide more than 30% of the cover under the canopy? Yes = **Category I bog** No – Go to **SC 4.5** SC 4.5. Do the species listed in Table 6 comprise at least 20% of the total plant cover within an area of peats and mucks? Yes = **Is a Calcareous Fen for purpose of rating** No – Go to **SC 4.6** SC 4.6. Do the species listed in Table 6 comprise at least 10% of the total plant cover in an area of peats and mucks, AND one of the two following conditions is met: — Marl deposits [calcium carbonate ($CaCO_3$) precipitate] occur on the soil surface or plant stems — The pH of free water is ≥ 6.8 AND electrical conductivity is ≥ 200 uS/cm at multiple locations within the wetland Yes = **Is a Category I calcareous fen** No = **Is not a calcareous fen**	**Cat. I** **Cat. I**

SC 5.0. Forested Wetlands Does the wetland have an area of forest rooted within its boundary that meets **at least one** of the following three criteria? (*Continue only if you have identified that a forested class is present in question H 1.1*) — The wetland is within the 100 year floodplain of a river or stream — Aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species — There is at least ¼ ac of trees (even in wetlands smaller than 2.5 ac) that are "mature" or "old-growth" according to the definitions for these priority habitats developed by WDFW *(see definitions in question H3.1)* Yes – Go to **SC 5.1** No = **Not a forested wetland with special characteristics**	
SC 5.1. Does the wetland have a forest canopy where more than 50% of the tree species (by cover) are slow growing native trees (*see Table 7*)? Yes = **Category I** No – Go to **SC 5.2** SC 5.2. Does the wetland have areas where aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species? Yes = **Category I** No – Go to **SC 5.3** SC 5.3. Does the wetland have at least ¼ acre with a forest canopy where more than 50% of the tree species (by cover) are fast growing species (*see Table 7*)? Yes = **Category II** No – Go to **SC 5.4** SC 5.4. Is the forested component of the wetland within the 100 year floodplain of a river or stream? Yes = **Category II** No = **Not a forested wetland with special characteristics**	**Cat. I** **Cat. I** **Cat. II** **Cat. II**
Category of wetland based on Special Characteristics *Choose the highest rating if wetland falls into several categories* If you answered No for all types, enter "Not Applicable" on Summary Form	

Appendix B: WDFW Priority Habitats in Eastern Washington

Priority habitats listed by WDFW (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here: http://wdfw.wa.gov/conservation/phs/list/)

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland: ***NOTE:*** *This question is independent of the land use between the wetland and the priority habitat.*

— **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

— **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report*).

— **Old-growth/Mature forests:** Old-growth east of Cascade crest – Stands are highly variable in tree species composition and structural characteristics due to the influence of fire, climate, and soils. In general, stands will be >150 years of age, with 10 trees/ac (25 trees/ha) that are > 21 in (53 cm) dbh, and 1-3 snags/ac (2.5-7.5 snags/ha) that are > 12-14 in (30-35 cm) diameter. Downed logs may vary from abundant to absent. Canopies may be single or multi-layered. Evidence of human-caused alterations to the stand will be absent or so slight as to not affect the ecosystem's essential structures and functions. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west and 80-160 years old east of the Cascade crest.

— **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158 – see web link above*).

— **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

— **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.

— **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.

— **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.

— **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

— **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 12 in (30 cm)in eastern Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

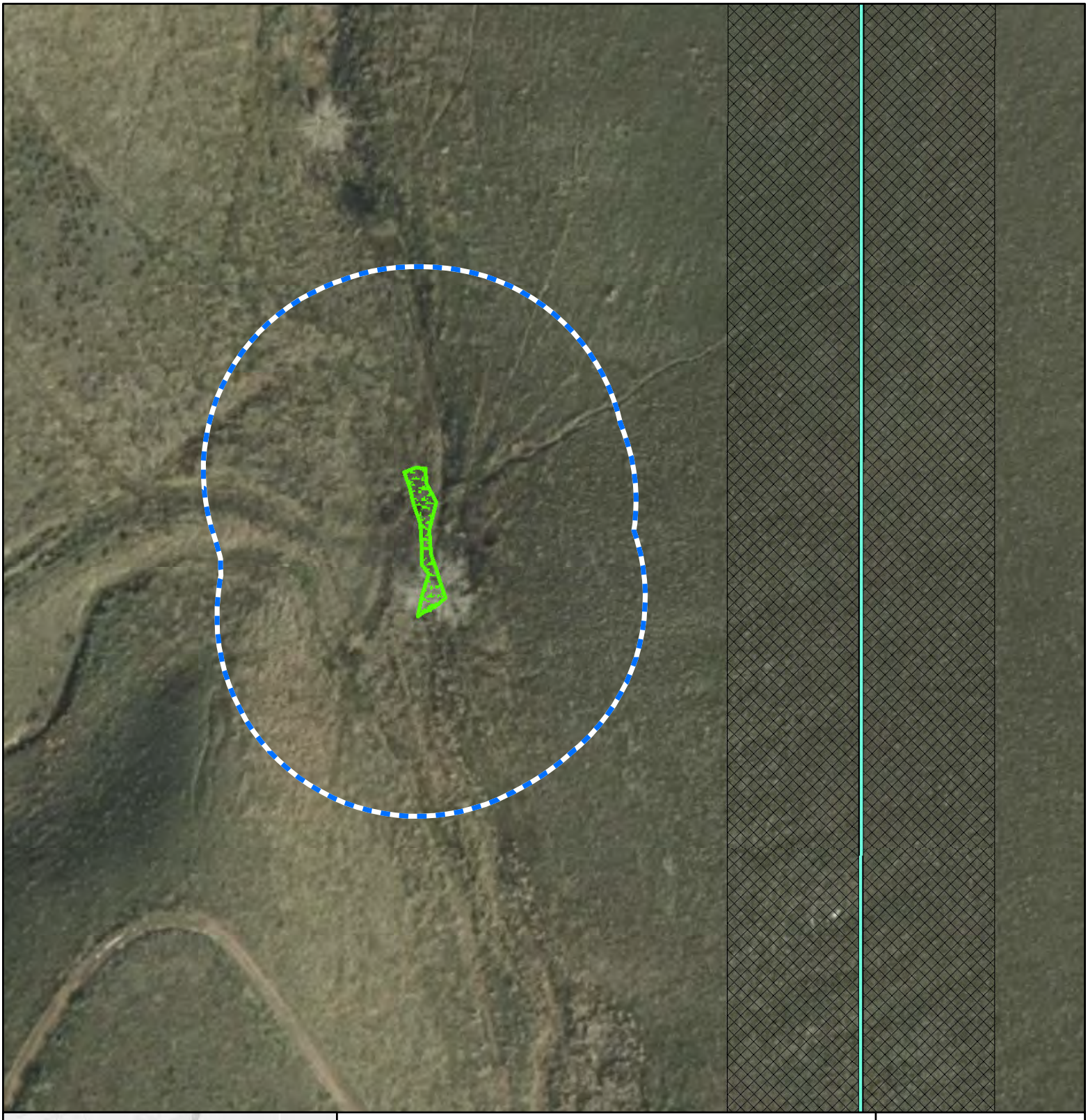
— **Shrub-steppe:** A nonforested vegetation type consisting of one or more layers of perennial bunchgrasses and a conspicuous but discontinuous layer of shrubs (see Eastside Steppe for sites with little or no shrub cover).

— **Eastside Steppe:** Nonforested vegetation type dominated by broadleaf herbaceous flora (i.e., forbs), perennial bunchgrasses, or a combination of both. Bluebunch wheatgrass (*Pseudoroegneria spicata*) is often the prevailing cover component along with Idaho fescue (*Festuca idahoensis*), Sandberg bluegrass (*Poa secunda*), rough fescue (*F. campestris*), or needlegrasses (*Achnatherum* spp.).

— **Juniper Savannah:** All juniper woodlands.

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

This page left blank intentionally



Area of Detail

Project Lease Boundary

Wetland

Micrositing Corridor

150' Buffer

230-kV Intertie Transmission Line (Primary)

Figure 1
Wetland E-10

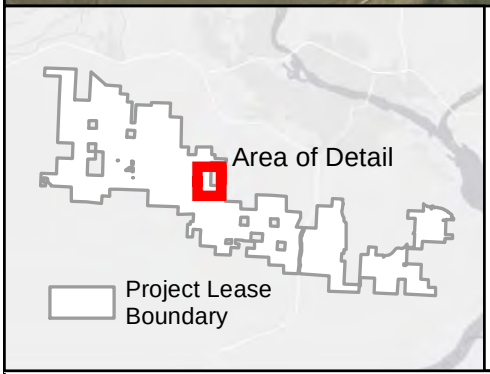
Horse Heaven Wind Project

SCOUT CLEAN ENERGY

BENTON COUNTY, WA

1:1,200 **WGS 1984 UTM Zone 11N** 0 10 20 40 **Meters** NOT FOR CONSTRUCTION TETRA TECH





Wetland
Micrositing Corridor
150' Buffer
230-kV Intertie Transmission Line (Primary)

Field Verified Habitat
Agricultural land
Unclassified Grassland
Sagebrush Shrub-steppe

Figure 2
Wetland E-10

Horse Heaven Wind Project

SCOUT CLEAN ENERGY

BENTON COUNTY, WA

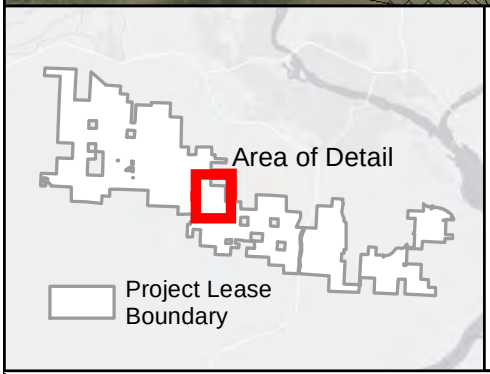
1:12,000 **WGS 1984 UTM Zone 11N**

0 0.25 0.5 Kilometers

NOT FOR CONSTRUCTION

TETRA TECH





Wetland

Contributing Watershed

Micrositing Corridor

Figure 3

Wetland E-10

Horse Heaven Wind Project

SCOUT CLEAN ENERGY

BENTON COUNTY, WA

1:18,000 **WGS 1984 UTM Zone 11N**

0 0.25 0.5 Kilometers

NOT FOR CONSTRUCTION

TETRA TECH

Assessed Water/Sediment Filter

ater

- Category 5 - 303d
- Category 4C
- Category 4B
- Category 4A
- Category 2
- Category 1

diment

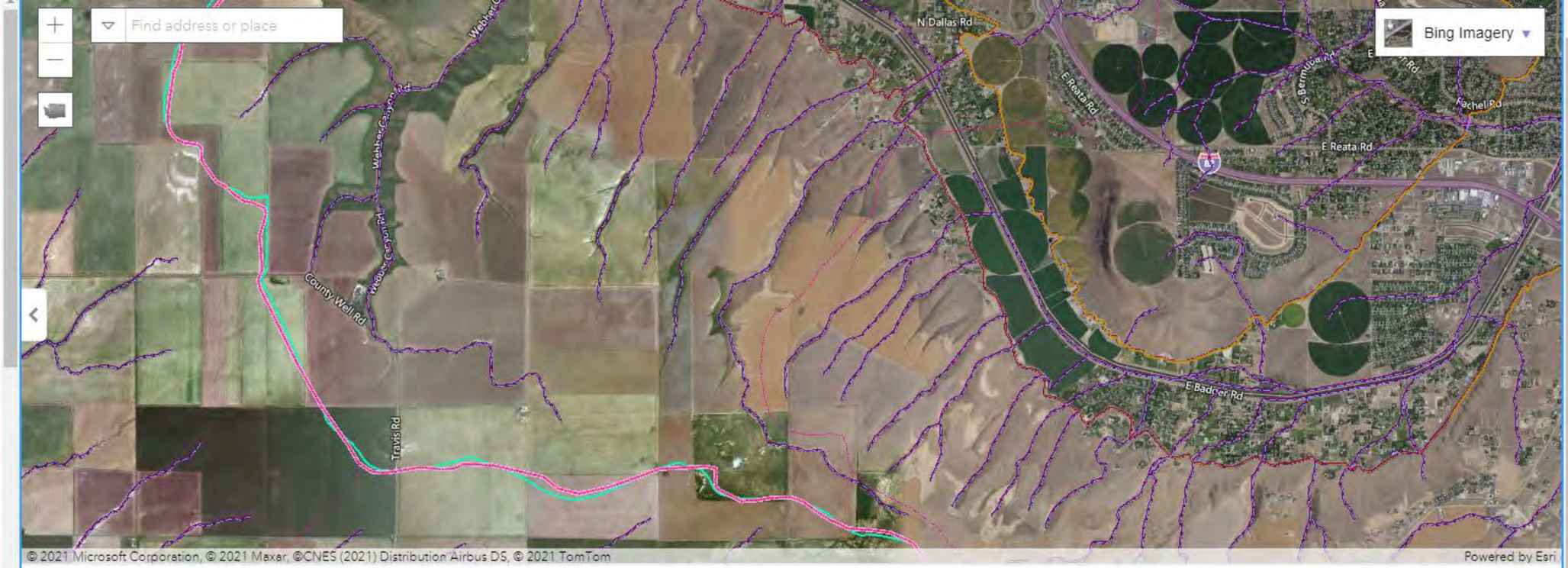
- Category 5 - 303d
- Category 4C
- Category 4B
- Category 4A
- Category 2
- Category 1

Water Quality Standards Filter

- All Standards

National Hydrography Dataset

ID Watercourses



Assessed Water/Sediment Zoom to selection Table to CSV

Find	Listing ID	Assessment Unit ID	Category	Medium	Parameter	Details
	66746	170200011202_01_01	5	Water	Dissolved Oxygen	View
	11253	170200050203_01_01	5	Water	Temperature	View
	42784	170200050203_01_01	5	Water	Dissolved Oxygen	View

sessed Water/Sediment Filter

Category 5 - 303d
Category 4C
Category 4B
Category 4A
Category 2
Category 1

ment

Category 5 - 303d
Category 4C
Category 4B
Category 4A
Category 2
Category 1

ater Quality Standards Filter

p data not visible at this scale, zoom in to view

ater Resource Inventory Areas



Assessed Water/Sediment

Zoom to selection | Table to CSV

Find	Listing ID	Assessment Unit ID	Category	Medium	Parameter	Details
	66746	170200011202_01_01	5	Water	Dissolved Oxygen	View
	11253	170200050203_01_01	5	Water	Temperature	View
	42784	170200050203_01_01	5	Water	Dissolved Oxygen	View

APPENDIX C
PHOTOLOG



Photopoint 1. Overview of Slope



Photopoint 2. No beds, no banks, no stream present on NHD line.



Photopoint 3. Ephemeral drainage, upland vegetation with no sign of water. EPH100.



Photopoint 4. Ephemeral drainage, upland vegetation with no sign of water. EPH100.



Photopoint 5. Erosional feature. EPH101.



Photopoint 6. Erosional feature. EPH102.



Photopoint 7. No beds, no banks, no stream present on NHD line.



Photopoint 8. Streambed with watermarks on rocks, and water in pools due to recent rainfall. INT01.



Photopoint 9. Streambed with watermarks on rocks, and water in pools due to recent rainfall. INT01.



Photopoint 10. Streambed with watermarks on rocks, and water in pools due to recent rainfall. INT01.



Photopoint 11. Water in pools due to recent rainfall. INT01.



Photopoint 12. Waterline on rocks. INT01.



Photopoint 14. No beds, no banks, no stream present on NHD line.



Photopoint 15. Ephemeral drainage, upland vegetation with no sign of water. EPH105.



Photopoint 16. Ephemeral drainage, upland vegetation with no sign of water. Yarrow in channel. EPH105.



Photopoint 18. Ephemeral drainage, upland vegetation with no sign of water. EPH104.



Photopoint 19. Ephemeral drainage, upland vegetation with no sign of water. EPH105.



Photopoint 20. Ephemeral drainage, upland vegetation with no sign of water. EPH205.



Photopoint 21. No beds, no banks, no stream present on NHD line.



Photopoint 22. Ephemeral drainage, upland vegetation with no sign of water. EPH202.



Photopoint 23. Ephemeral drainage, upland vegetation with no sign of water. EPH203.



Photopoint 24. Well in bedrock in stream bottom.



Photopoint 25. No beds, no banks, no stream present on NHD line.



Photopoint 26. No beds, no banks, no stream present on NHD line.



Photopoint 27. No beds, no banks, no stream present on NHD line.



Photopoint 28. No beds, no banks, no stream present on NHD line.



Photopoint 29. No beds, no banks, no stream present on NHD line.



Photopoint 30. No beds, no banks, no stream present on NHD line.



Photopoint 31. No beds, no banks, no stream present on NHD line.



Photopoint 32. No beds, no banks, no stream present on NHD line.



Photopoint 33. No beds, no banks, no stream present on NHD line.



Photopoint 35. Garbage dump.



Photopoint 36. Ephemeral drainage, upland vegetation with no sign of water. EPH200.



Photopoint 38. No beds, no banks, no stream present on NHD line.



Photopoint 39. No beds, no banks, no stream present on NHD line.



Photopoint 41. Soil sample site. SS01.



Photopoint 42. No beds, no banks, no stream present on NHD line.



Photopoint 43. No beds, no banks, no stream present on NHD line.



Photopoint 44. No beds, no banks, no stream present on NHD line.



Photopoint 45. No beds, no banks, no stream present on NHD line.



Photopoint 46. No beds, no banks, no stream present on NHD line.



Photopoint 47. No beds, no banks, no stream present on NHD line.



Photopoint 48. No beds, no banks, no stream present on NHD line.



Photopoint 49. No beds, no banks, no stream present on NHD line.



Photopoint 50. Erosional Feature. EPH305.



Photopoint 51. No beds, no banks, no stream present on NHD line.



Photopoint 52. No beds, no banks, no stream present on NHD line.



Photopoint 53. No beds, no banks, no stream present on NHD line.



Photopoint 54. No beds, no banks, no stream present on NHD line.



Photopoint 55. No beds, no banks, no stream present on NHD line.



Photopoint 56. No beds, no banks, no stream present on NHD line.



Photopoint 57. No beds, no banks, no stream present on NHD line.



Photopoint 58. No beds, no banks, no stream present on NHD line.



Photopoint 59. Soil Sample Site. SS02.



Photopoint 60. Streambed with damp soils. INT02.



Photopoint 61. Streambed with damp soils. INT02.



Photopoint 62. Streambed with damp soils. INT02.



Photopoint 63. Streambed with damp soils. INT02.



Photopoint 64. Streambed with damp soils. INT02.



Photopoint 65. Ephemeral drainage, upland vegetation with no sign of water. EPH412.



Photopoint 67. No beds, no banks, no stream present on NHD line.



Photopoint 68. No beds, no banks, no stream present on NHD line.



Photopoint 69. No beds, no banks, no stream present on NHD line.



Photopoint 70. No beds, no banks, no stream present on NHD line.



Photopoint 71. No beds, no banks, no stream present on NHD line.



Photopoint 72. Ephemeral drainage, upland vegetation with no sign of water. EPH301.



Photopoint 73. No beds, no banks, no stream present on NHD line.



Photopoint 74. Ephemeral drainage, upland vegetation with no sign of water. EPH300.



Photopoint 75. No beds, no banks, no stream present on NHD line.



Photopoint 76. No beds, no banks, no stream present on NHD line.



Photopoint 77. No beds, no banks, no stream present on NHD line.



Photopoint 78. Ephemeral drainage, upland vegetation with no sign of water. EPH308.



Photopoint 79. Ephemeral drainage, upland vegetation with no sign of water. EPH308.



Photopoint 80. No beds, no banks, no stream present on NHD line.



Photopoint 81. Ephemeral drainage, upland vegetation with no sign of water. EPH308.



Photopoint 82. No beds, no banks, no stream present on NHD line.



Photopoint 83. Ephemeral drainage, upland vegetation with no sign of water. EPH307.



Photopoint 84. No beds, no banks, no stream present on NHD line.



Photopoint 85. Ephemeral drainage, upland vegetation with no sign of water. EPH307.



Photopoint 86. No beds, no banks, no stream present on NHD line.



Photopoint 87. Ephemeral drainage, upland vegetation with no water. EPH307.



Photopoint 88. Ephemeral drainage, upland vegetation with no sign of water. EPH306.



Photopoint 89. No beds, no banks, no stream present on NHD line.



Photopoint 90. Ephemeral drainage, upland vegetation with no sign of water. EPH401.



Photopoint 91. No beds, no banks, no stream present on NHD line.



Photopoint 93. Streambed with watermarks on rocks, and water in pools due to recent rainfall. INT01.



Photopoint 94. Ephemeral drainage, upland vegetation with no sign of water. EPH400.



Photopoint 95. Ephemeral drainage, upland vegetation with no sign of water. EPH400.



Photopoint 96. Ephemeral drainage, upland vegetation with no sign of water. EPH303.



Photopoint 97. Ephemeral drainage, upland vegetation with no sign of water. EPH303.



Photopoint 98. No beds, no banks, no stream present on NHD line.



Photopoint 99. No beds, no banks, no stream present on NHD line. Road present in valley bottom.



Photopoint 100. No beds, no banks, no stream present on NHD line.



Photopoint 101. No beds, no banks, no stream present on NHD line.



Photopoint 102. Ephemeral drainage, upland vegetation with no sign of water. EPH405.



Photopoint 103. Ephemeral drainage, upland vegetation with no sign of water. EPH404.



Photopoint 104. Ephemeral drainage, upland vegetation with no sign of water. EPH405.



Photopoint 105. Ephemeral drainage, upland vegetation with no sign of water. EPH404.



Photopoint 107. No beds, no banks, no stream present on NHD line.



Photopoint 108. No beds, no banks, no stream present on NHD line.



Photopoint 109. No beds, no banks, no stream present on NHD line.



Photopoint 110. No beds, no banks, no stream present on NHD line.



Photopoint 111. No beds, no banks, no stream present on NHD line.



Photopoint 114. No beds, no banks, no stream present on NHD line.



Photopoint 115. No beds, no banks, no stream present on NHD line.



Photopoint 209. No beds, no banks, no stream present on NHD line.



Photopoint EPH104. Ephemeral drainage, upland vegetation with no sign of water.



Photopoint EPH104. Ephemeral drainage, upland vegetation with no sign of water.



Photopoint EPH500 levee 1. Ephemeral drainage, upland vegetation with no sign of water.



Photopoint EPH500 N. Ephemeral drainage, upland vegetation with no sign of water.



Photopoint EPH500 NE1. Ephemeral drainage, upland vegetation with no sign of water.



Photopoint EPH501 NW1. Ephemeral drainage, upland vegetation with no sign of water.



Photopoint EPH501 SE. Ephemeral drainage, upland vegetation with no sign of water.



Photopoint EPH501 SE1. Ephemeral drainage, upland vegetation with no sign of water.



Photopoint EPH500 levee 2. Ephemeral drainage, upland vegetation with no sign of water.



Photopoint XBB 310. No beds, no banks, no stream present on NHD line.



Photopoint XBB 300. No beds, no banks, no stream present on NHD line.



Photopoint XBB 301. No beds, no banks, no stream present on NHD line.



Photopoint XBB 302. No beds, no banks, no stream present on NHD line.



Photopoint XBB 303. No beds, no banks, no stream present on NHD line.



Photopoint XBB 304. No beds, no banks, no stream present on NHD line.



Photopoint XBB 305. No beds, no banks, no stream present on NHD line.



Photopoint XBB 306. No beds, no banks, no stream present on NHD line.



Photopoint XBB 307. No beds, no banks, no stream present on NHD line.



Photopoint XBB 308. No beds, no banks, no stream present on NHD line.



Photopoint XBB 309. No beds, no banks, no stream present on NHD line.



Photopoint XBB 310. No beds, no banks, no stream present on NHD line.



Photopoint XBB 311. No beds, no banks, no stream present on NHD line.



Photopoint XBB 312. No beds, no banks, no stream present on NHD line.



Photopoint XBB 313. No beds, no banks, no stream present on NHD line.



Photopoint 600. Ephemeral drainage, upland vegetation with no sign of water . Overview of drainage, EPH401.



Photopoint 601. Ephemeral drainage, upland vegetation with no sign of water Ephemeral drainage, EPH401.



Photopoint 602. Ephemeral drainage, upland vegetation with no sign of water Ephemeral stream does not extend uphill. EPH306.



Photopoint 603. Ephemeral drainage, upland vegetation with no sign of water Ephemeral drainage, less than one foot wide. EPH306.



Photopoint 604. No beds, no banks, no stream present on NHD line. Cattle trail.



Photopoint 605. No beds, no banks, no stream present on NHD line. Ephemeral stream does not extend beyond this point.



Photopoint 606. No beds, no banks, no stream present on NHD line.



Photopoint 607. Ephemeral drainage, upland vegetation with no sign of water. Narrow ephemeral drainage, EPH600.



Photopoint 608. Ephemeral drainage, upland vegetation with no sign of water. Overview of EPH600.



Photopoint 609. No beds, no banks, no stream present on NHD line.



Photopoint 610. No beds, no banks, no stream present on NHD line. Culvert under road.



Photopoint 611. Ephemeral drainage, upland vegetation with no sign of water. Ephemeral drainage begins at this point, EPH602.



Photopoint 612. Ephemeral drainage, upland vegetation with no sign of water. EPH602.



Photopoint 613. End of EPH602.



Photopoint 614. No beds, no banks, no stream present on NHD line.



Photopoint 701. Ephemeral drainage, upland vegetation with no sign of water. EPH401.



Photopoint 702. No beds, no banks, no stream present on NHD line. Upstream end of EPH401.



Photopoint 703. Ephemeral drainage, upland vegetation with no sign of water. EPH401.



Photopoint 704. Ephemeral drainage, upland vegetation with no sign of water. EPH401.



Photopoint 705. No beds, no banks, no stream present on NHD line. Hillside between plowed fields.



Photopoint 706. No beds, no banks, no stream present on NHD line.



Photopoint 708. Ephemeral drainage, upland vegetation with no sign of water Ephemeral drainage, with trash pile. EPH306.



Photopoint 709. No beds, no banks, no stream present on NHD line.



Photopoint 710. No beds, no banks, no stream present on NHD line.



Photopoint 711. No beds, no banks, no stream present on NHD line.



Photopoint 712. No beds, no banks, no stream present on NHD line.



Photopoint 713. No beds, no banks, no stream present on NHD line. Bottom between two hills next to freeway.



Photopoint 714. No beds, no banks, no stream present on NHD line.



Photopoint 715. No beds, no banks, no stream present on NHD line.



Photopoint 716. No beds, no banks, no stream present on NHD line.



Photopoint 717. No beds, no banks, no stream present on NHD line.



Photopoint 718. No beds, no banks, no stream present on NHD line.



Photopoint 719. No beds, no banks, no stream present on NHD line.



Photopoint 720. Ephemeral drainage, upland vegetation with no sign of water. EPH700.



Photopoint 721. Ephemeral drainage, upland vegetation with no sign of water. EPH700, leading up to culvert under road.



Photopoint 722. No beds, no banks, no stream present on NHD line.



Photopoint 723. Ephemeral drainage, upland vegetation with no sign of water. EPH700.



Photopoint 724. Ephemeral drainage, upland vegetation with no sign of water. Upstream end of EPH700, begins to lose bed and banks.



Photopoint 725. No beds, no banks, no stream present on NHD line.



Photopoint 800. No beds, no banks, no stream present on NHD line. Water retention pond, with no culvert.



Photopoint 801. No beds, no banks, no stream present on NHD line.



Photopoint 802. No beds, no banks, no stream present on NHD line.



Photopoint 803. No beds, no banks, no stream present on NHD line.



Photopoint 804. No beds, no banks, no stream present on NHD line.



Photopoint 805. No beds, no banks, no stream present on NHD line.



Photopoint 806. No beds, no banks, no stream present on NHD line.



Photopoint 807. No beds, no banks, no stream present on NHD line.



Photopoint 808. No beds, no banks, no stream present on NHD line.



Photopoint 809. No beds, no banks, no stream present on NHD line.



Photopoint 810. No beds, no banks, no stream present on NHD line.



Photopoint 811. Ephemeral drainage, upland vegetation with no sign of water, EPH800.



Photopoint 812. Ephemeral drainage, upland vegetation with no sign of water, EPH800.



Photopoint 813. No beds, no banks, no stream present on NHD line. No culvert alongside road.



Photopoint 814. No beds, no banks, no stream present on NHD line.



Photopoint 900. No beds, no banks, no stream present on NHD line.



Photopoint 900b. Ephemeral drainage, typical conditions. EPH-900. Facing southwest.



Photopoint 900c. Ephemeral drainage. EPH-900. No bed or banks southwest of here.



Photopoint 904. Ephemeral drainage, typical conditions. EPH-904. Facing northwest.



Photopoint 904a. Ephemeral drainage, typical conditions. EPH-904A. Facing north.



Photopoint 905. Ephemeral drainage, typical conditions. EPH-904. Facing west.



Photopoint E10. Sample site. No water, horsetail, well pump in background.



Photopoint E10a. Overview.



Photopoint E10b. Sample site. Upland, great basin wildrye and non-hydric soils.



Photopoint E18. Sample site. Upland, cereal rye and non-hydric soils.



Photopoint 901. No beds, no banks, no stream present on NHD line. Facing northeast.



Photopoint 902. No beds, no banks, no stream present on NHD line. Facing northeast.