

GOLDENDALE ENERGY STORAGE HYDROELECTRIC PROJECT

Federal Energy Regulatory Commission Project No. 14861

Klickitat County, Washington

DRAFT LICENSE APPLICATION Appendix B: Wetlands and Waters Delineation Report

For:

FFP Project 101, LLC



June 2019

TABLE OF CONTENTS

1.0 Introduction..... 1
 1.1 Site Location..... 4
2.0 Desktop Review 6
 2.1 Soil Survey Data 6
 2.2 National Hydrography Dataset & National Wetland Inventory 8
3.0 Wetland and Waters Delineation Methodology..... 8
 3.1 Determination of Hydrophytic Vegetation 8
 3.2 Determination of Hydric Soils 9
 3.3 Determination of Wetland Hydrology 10
 3.4 Determination of Waterbodies 10
4.0 Results..... 10
 4.1 S7 12
 4.2 S8 12
 4.3 P1 12
 4.4 P2 12
 4.5 S17 13
 4.6 S24 13
 4.7 W6..... 13
5.0 Conclusions..... 14
6.0 References..... 14

List of Figures

Figure 1-1: Vicinity Map	2
Figure 1-2: Study Area.....	3
Figure 1.1-1: USGS Topographic Map.....	5
Figure 2.1-1: NRCS Soils	7
Figure 4-1: NHD and NWI Mapped Features.....	11

List of Tables

Table 2.1-1: Soil Map Units within the Study Area.....	6
Table 3.1-1: Plant Indicator Status Categories.....	9
Table 4-7-1: Wetland and Water Features Confirmed in 2019 Delineation in the Proposed Project Boundary	14

List of Attachments

Attachment 1: Wetland Determination Data Forms

Attachment 2: Photograph Log

Acronyms and Abbreviations

ERM	ERM-West, Inc.
FAC	facultative plants
FACW	facultative wetland plants
HUC	hydrologic unit code
NHD	National Hydrography Database
NWI	National Wetlands Inventory
NRCS	The Natural Resources Conservation Service
OBL	obligate wetland plants
OHWM	ordinary high water mark
UPL	upland plants
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United State Fish and Wildlife Service
USGS	United States Geological Survey

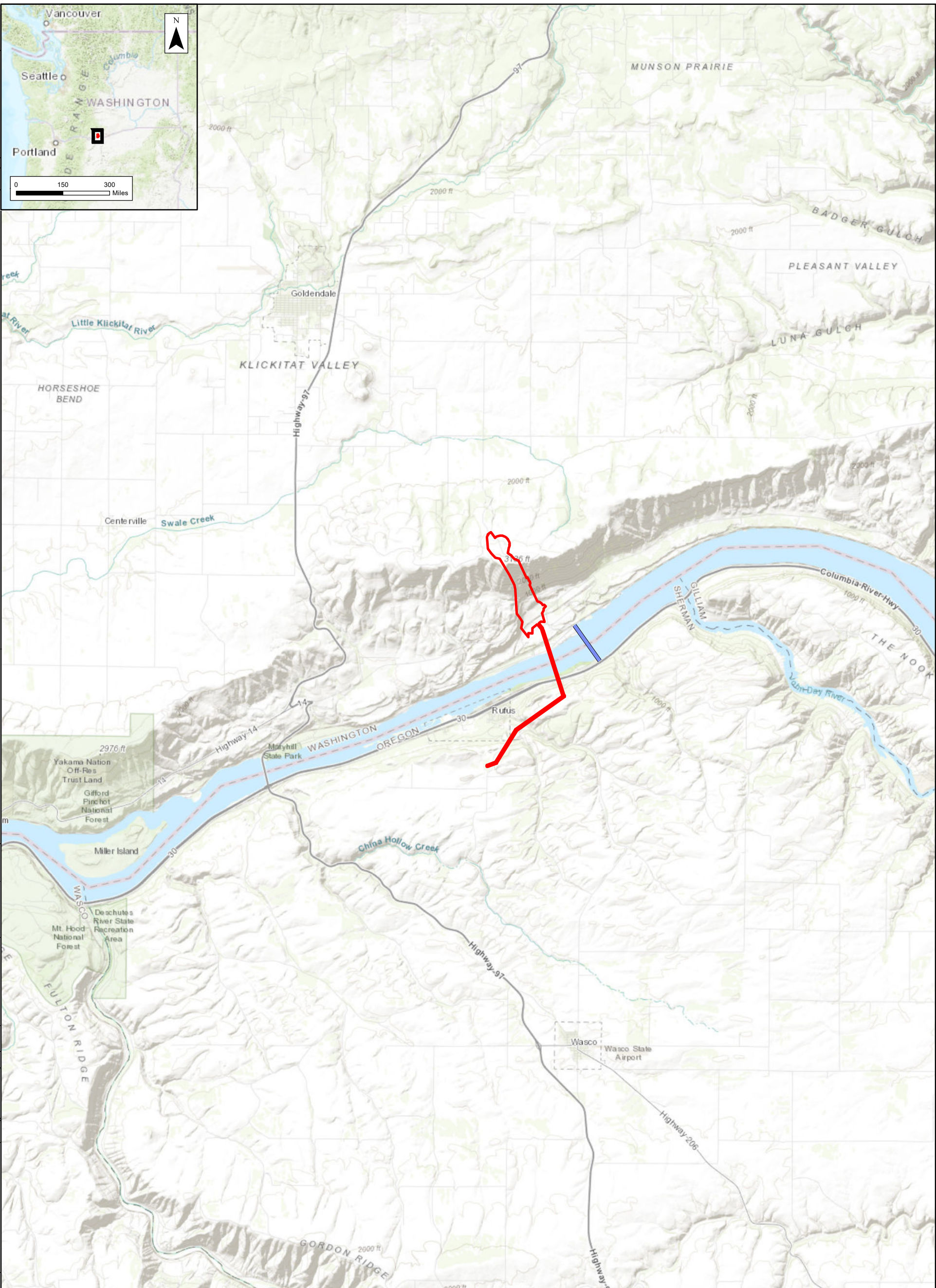
1.0 INTRODUCTION

Presented herein are findings of a desktop review and field delineation of wetland and waters within the Goldendale Pumped Storage Project (Project) footprint (the study area) located at the Columbia Gorge Aluminum Smelter property near Goldendale, Klickitat County, Washington. The location and layout of the study area are illustrated on Figures 1-1 and 1-2. ERM-West, Inc. (ERM) prepared this report on behalf of the FFP Project 101, LLC.

FFP Project 101, LLC intends to permit the Project and in doing so is required to identify and avoid or mitigate for wetlands and waters within their Project footprint. ERM completed a wetland and waters delineation within the study area in May 2019 to determine whether and where wetlands and waters exist within the study area.

This report documents the presence and geographic extent of wetlands and waters, and describes how these features were distinguished from uplands. This delineation is subject to agency verification and approval.

Created By: Kelly Lyons Date: 10/29/2019 Project: 0483340
FILE: M:\Projects\Goldendale Energy Storage Project\umaps\DLA 2019\Wetland and Waters Report\Figure 1-1 Vicinity Map.mxd | REVISED: 10/29/2019 | SCALE: 1:126,720 when printed at 11x17



Legend
[Red Outline] Study Area
[Blue Line] John Day Dam

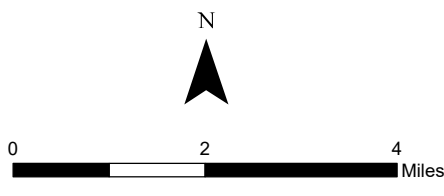
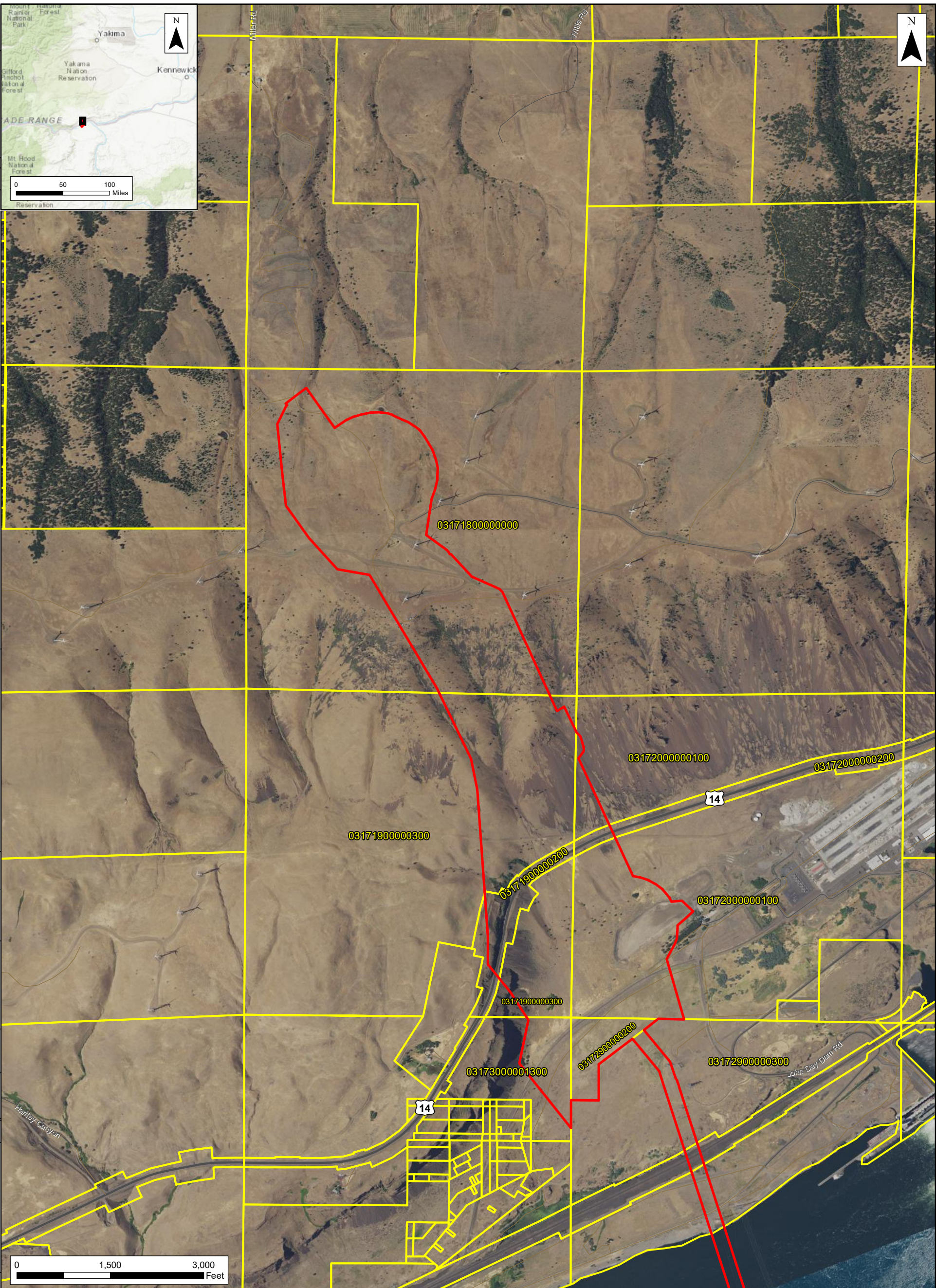


Figure 1-1
Vicinity Map
Wetland and Waters Delineation Report
Goldendale Energy Storage Project
Goldendale, WA

Created By: Kelly Lyons Date: 10/29/2019 Project: 0489340
FILE: M:\Projects\Goldendale Energy Storage Project\mxd\DLA 2019\Wetland and Waters Report\Figure 1-2 Study Area.mxd | REVISED: 10/29/2019 | SCALE: 1:18,000 when printed at 11x17



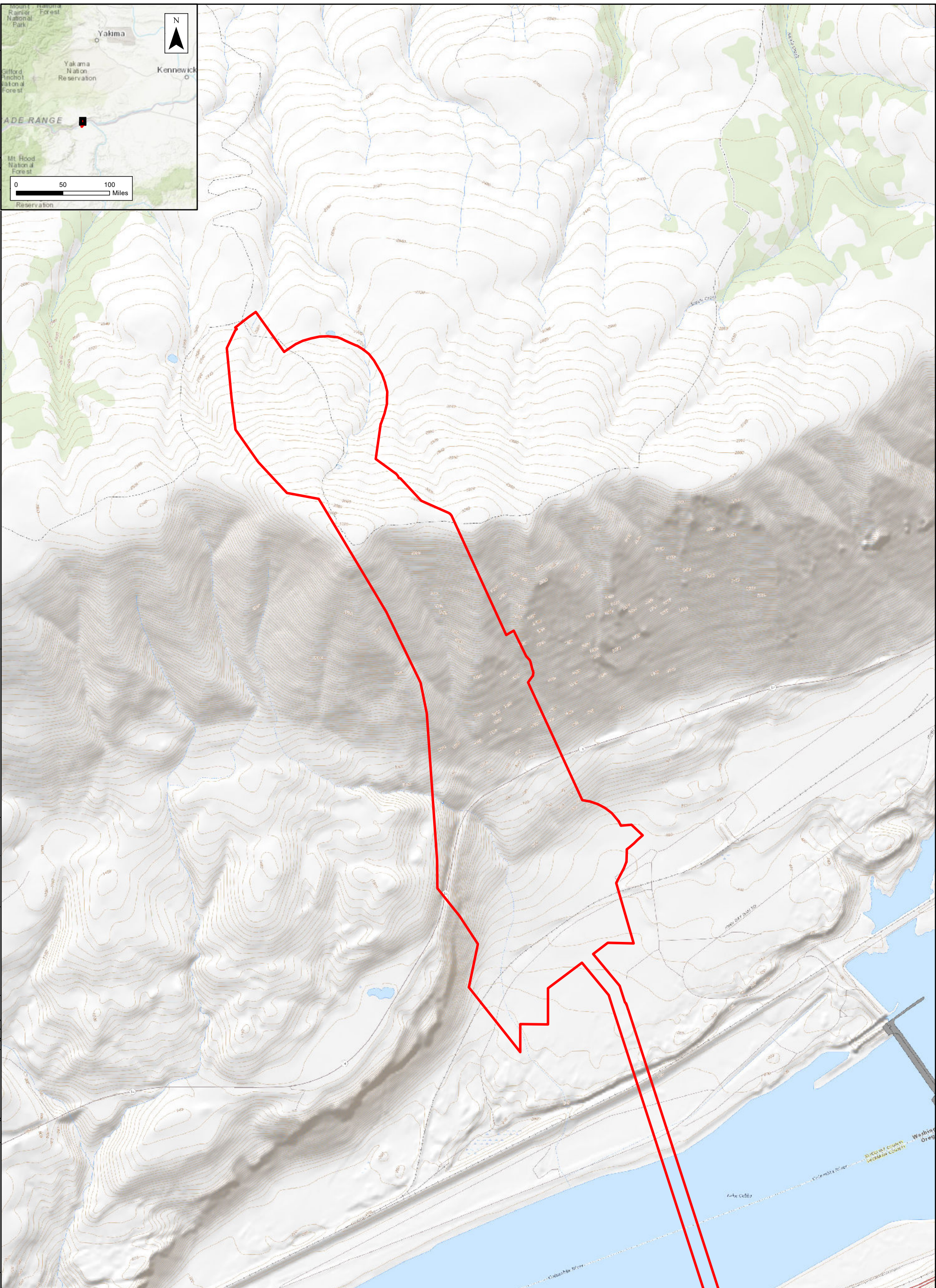
- Legend**
- Tax Lot Parcel
 - Study Area


Figure 1-2
Study Area
Wetland and Waters Delineation Report
Goldendale Energy Storage Project
Goldendale, WA

Source: National Agricultural Imagery Program, July 2017, flown 1m per pixel; NAD 1983 HARN StatePlane Washington South FIPS 4602 Feet

1.1 Site Location

The study area is located in Klickitat County, Washington near the Columbia River just downstream of the John Day Dam at river mile 215.6. The study area spans two U.S. Geological Survey (USGS) 8-digit hydrologic unit code (HUC) watersheds (USGS 2019). USGS topography of the area is shown on Figure 1.1-1. The upper portion of the study area is located in the 865,340-acre Klickitat River watershed (HUC 17070106), on lands that drain north then west to the Klickitat River, and ultimately to the Columbia River 35 miles downstream of the study area. The lower portion of the study area is within the 1,381,073-acre Middle Columbia-Hood (HUC 17070105) watershed, which spans both sides of the Columbia River in Oregon and Washington. Both watersheds are part of a larger Middle Columbia River Watershed.



Legend
 Study Area

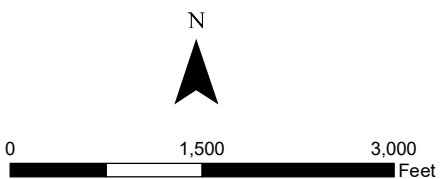


Figure 1.1-1
USGS Topographic Map
 Wetland and Waters Delineation Report
 Goldendale Energy Storage Project
 Goldendale, WA

2.0 DESKTOP REVIEW

Before commencing fieldwork, the following data sources were reviewed for information on vegetation patterns, topography, drainage, and potential or known critical areas, including wetlands, in the vicinity of the study area:

- USGS 7.5 Minute Topographical Quadrangles;
- U.S. Department of Agriculture (USDA), National Resource Conservation Service soil survey maps, 2019;
- U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory maps, 2019;
- USGS National Hydrography Database (NHD) maps, 2019;
- Aerial photographs (Google Earth and ESRI Topographic Web Mapping); and
- Priority Habitats and Species Mapper, Washington Department of Fish and Wildlife, 2019.

ERM reviewed the reference materials for preliminary identification of potential wetlands and waters and other critical areas within and abutting the study area.

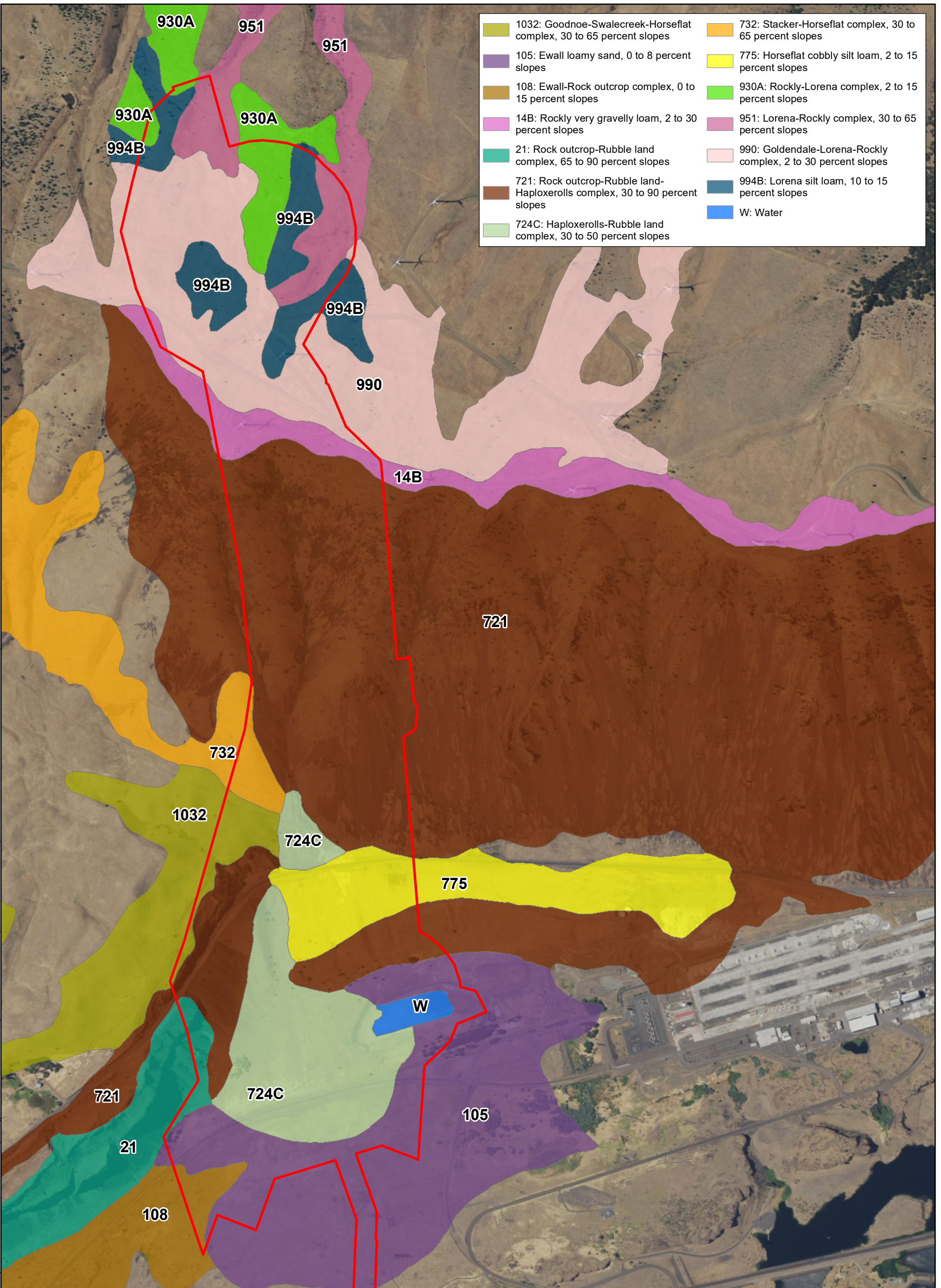
2.1 Soil Survey Data

The Natural Resources Conservation Service (NRCS) soil survey identifies 13 soil map units within the study area (Table 2.1-1; Figure 2.1-1). None of the soil map units are considered hydric (USDA/NRCS 2019). The NRCS data identifies a portion of the study area south of Highway 14 as “water”. This area corresponds to the former location of an artificial water impoundment associated with the Columbia Gorge Aluminum smelter (and later the NSC smelter). Review of Google Earth imagery suggests this impoundment was demolished between 2003 and 2005.

Table 2.1-1: Soil Map Units within the Study Area

Map Unit Symbol	Map Unit name	Drainage Class	Hydric Soil Rating
14B	Rockly very gravelly loam, 2–30 percent slopes	Well drained	No
21	Rock outcrop-Rubble land complex, 65–90 percent slopes	Well drained	No
30A	Rockly-Lorena complex, 2–15 percent slopes	Well drained	No
94A	Lorena silt loam, 10–15 percent slopes	Well drained	No
105	Ewall loamy sand, 0–8 percent slopes	Excessively drained	No
108	Ewall-Rock outcrop complex, 0–15 percent slopes	Excessively drained	No
721	Rock outcrop-Rubble land-Haploxerolls complex, 30–90 percent slopes	Well drained	No
724C	Haploxerolls-Rubble land complex, 30–50 percent slopes	Well drained	No
732	Stacker-Horseflat complex, 30–65 percent slopes	Well drained	No
775	Horseflat cobbly silt loam, 2–15 percent slopes	Well drained	No
951	Lorena-Rockly complex, 30–65 percent slopes	Well drained	No
990	Goldendale-Lorena-Rockly complex, 2–30 percent slopes	Well drained	No
1032	Goodnoe-Swalecreek-Horseflat complex, 30–65 percent slopes	Well drained	No

Source: USDA/NRCS 2019



Legend
 Study Area

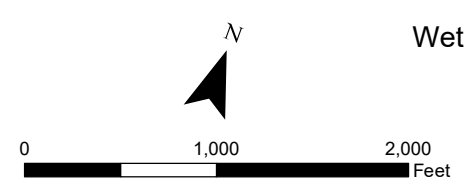


Figure 2.1-1
NRCS Soils
 Wetland and Waters Delineation Report
 Goldendale Energy Storage Project
 Goldendale, WA

2.2 National Hydrography Dataset & National Wetland Inventory

The NHD is based on USGS data that represents the water drainage network of the U.S. with features such as rivers, streams, lakes, and ponds. The National Wetlands Inventory (NWI) includes wetlands and deep-water habitats identified by USFWS staff by analyzing aerial imagery. The NHD and NWI data show the following features within the study area (USGS 2019; USFWS 2019):

- Two perennial stream channels in the northern portion of the study area. The NWI identifies these features as riverine, unknown perennial, unconsolidated bottom, permanently flooded (R5UBH) streams.
- Two ponds in the northern portion of the study area. The NWI data only includes the northernmost pond, which is identified as a palustrine, unconsolidated bottom, permanently flooded, excavated (PUBHx) feature.
- An intermittent stream crossing Highway 14. The NWI data identifies this feature as a riverine, intermittent, streambed, seasonally flooded (R4SBC) stream.
- Two palustrine, scrub-shrub, broad-leaved deciduous, temporarily flooded (PSS1A) wetlands located near the intermittent stream on the northwest side Highway 14.

3.0 WETLAND AND WATERS DELINEATION METHODOLOGY

Wetland and upland conditions within the study area were identified and classified in accordance with the following standard protocols:

- Routine Determination Method described in the Corps of Engineers Wetland Delineation Manual (USACE 1987) and in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0) (USACE 2008)
- USFWS Classification System (Cowardin et al. 1979)

Wetlands are distinguished from uplands based on examination of the presence of hydrophytic vegetation, hydric soils, and wetland hydrology. In order to determine that a feature may be a wetland, all three parameters must be present. United States Army Corps of Engineers (USACE) Wetland Determination Data Forms were completed to aid in these determinations (included as Attachment 1). Photographs from the study are included as Attachment 2.

3.1 Determination of Hydrophytic Vegetation

Hydrophytic and upland vegetation were identified in the field by visual determination of dominant plant species (defined as plants that comprise 20 percent or more of the cover value observed at a given location). At each data point, herbaceous vegetation was analyzed within a 5-foot diameter. Percent cover was visually estimated and recorded for each species present. Vegetation was observed within the growing season for the region. The Regional Supplement to

the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0) defines the regional growing season as when two or more different non-evergreen vascular plant species growing in the wetland or surrounding areas exhibit one or more indicators of biological activity (e.g., emergence from the ground, appearance of new growth, or bud burst on woody plants) (USACE 2008).

The indicator status of each observed plant species was confirmed using the State of Washington 2016 Wetland Plant List (Lichvar et al. 2016). Species not listed were assumed to be upland plants (UPL), as directed by the 2008 Regional Supplement (USACE 2008). An area was considered to have hydrophytic vegetation when more than 50 percent of the dominant species were obligate wetland plants (OBL), facultative wetland plants (FACW), or facultative plants (FAC). Indicator status categories are defined in Table 3.1-1.

Table 3.1-1: Plant Indicator Status Categories

Indicator Category*	Indicator Symbol	Definition
Obligate Wetland Plants	OBL	Plants that occur almost always (estimated probability >99%) in wetlands under natural conditions, but which may also occur rarely (estimated probability <1%) in non-wetlands.
Facultative Wetland Plants	FACW	Plants that occur usually (estimated probability >67%) in wetlands, but also occur (estimated probability 1% to 33%) in non-wetlands.
Facultative Plants	FAC	Plants with a similar likelihood (estimated probability 33 to 67%) of occurring in both wetlands and non-wetlands**.
Facultative Upland Plants	FACU	Plants that occur sometimes (estimated probability 1 to <33%) in wetlands, but occur more often (estimated probability >67 to 99%) in non-wetlands.
Upland Plants	UPL	Plants that occur rarely (estimated probability <1%) in wetlands, but occur almost always (estimated probability >99%) in non-wetlands under natural conditions.

*Categories were originally developed and defined by the USFWS National Wetlands Inventory and subsequently modified by the National Plant List Panel.

3.2 Determination of Hydric Soils

ERM examined soil profiles in and along the perimeter of potential wetlands and identified the soil type(s) using the Munsell soil chart (USDA 2009), descriptions in the Field Indicators of Hydric Soils in the United States (USDA 2018), and the USDA/NRCS Soil Survey data (USDA/NRCS 2019). The Munsell System includes three components to classify soil color: hue (soil color), value (lightness and darkness), and chroma (color intensity) that are defined in a book of color chips. Hydric soils were identified using the Field Indicators of Hydric Soils in the United States (USDA 2018).

3.3 Determination of Wetland Hydrology

Wetland hydrology was determined to be present if one or more of the following characteristics were present:

- Landscape position and surface topography convey and concentrate water (e.g., the position of the site relative to an upslope water source, location within a distinct wetland drainage pattern, or concave surface topography with accumulated water).
- Inundation or saturation for a long duration (defined by the NRCS as inundation in a single event that ranges from 7 days to 1 month) is either inferred based on field indicators or observed during field surveys.
- Residual evidence of ponding or flooding is observed (e.g., scour marks, sediment deposits, algal matting, and drift lines).

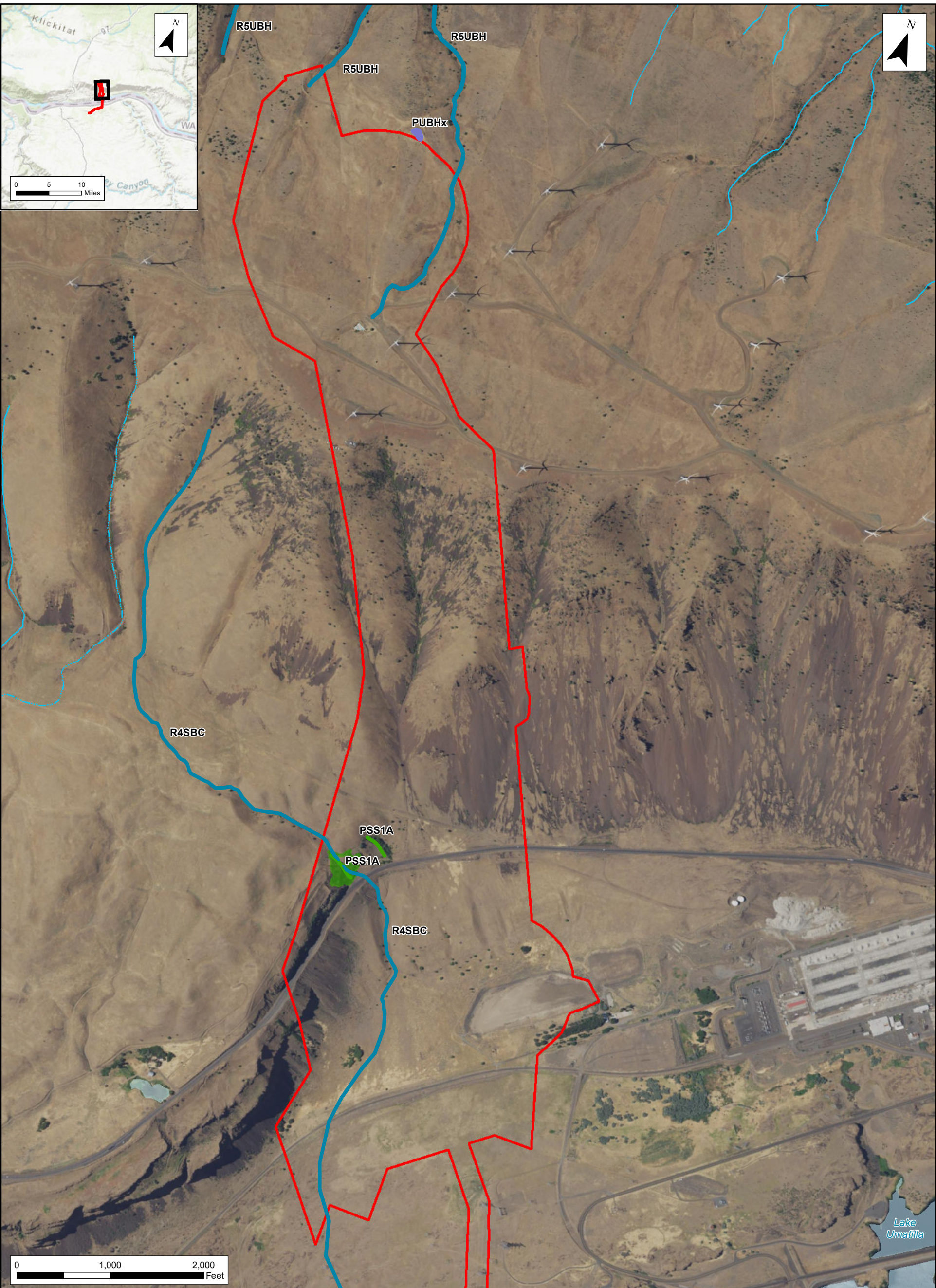
Assessment of hydrologic criteria was based on primary and secondary indicators. Primary indicators observed in the study area included observations of water marks and algal mat or crust. If the data point was situated above the level of seasonal inundation or saturation, the criteria were not met; conversely, if it was situated below the elevation of seasonal inundation or saturation, the criteria were met. Secondary indicators observed in the study area included drainage patterns, geomorphic position, and the FAC-neutral test of vegetation.

3.4 Determination of Waterbodies

Regulated waterbodies are stream channels or impoundments with a defined ordinary high water mark (OHWM). The USACE defines an OHWM as the “line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas” (USACE 2005).

4.0 RESULTS

ERM delineated two ephemeral streams, two ponds, one intermittent stream and one seep within the study area (Figure 4-1). Table 4.7-1 summarizes the results of the field investigation.



- Legend**
- Study Area
 - National Hydrography Dataset
 - Stream - Perennial
 - - - Stream - Intermittent
 - Lake/Pond - Intermittent
 - Lake/Pond - Perennial;
 - Lake/Pond - Perennial

- National Wetlands Inventory
- Riverine
 - Freshwater Pond
 - Palustrine Scrub/Shrub
 - 2015 NWI

Notes:
 NHD: National Hydrography Dataset
 NHD credit: US Geological Survey
 NWI: National Wetlands Inventory.
 NWI credit: US Fish and Wildlife Service

Figure 4-1
NHD and NWI Mapped Features
 Wetland and Waters Delineation Report
 Goldendale Energy Storage Project
 Goldendale, WA

4.1 S7

Feature S7 is identified as a perennial watercourse in both the NHD and NWI datasets that is located near the upper reservoir. However, based on observations during the May 2019 wetland and waters delineation this feature is an ephemeral stream channel that is 16 to 24 inches wide, 1 to 3 inches deep, and extends approximately 995 feet into the study area. The NHD and NWI both show this feature is about 950 feet longer and connects to pond P2; however, there is no evidence of an OHWM between P2 and the upper extent of S7 as mapped by ERM. Evidence of an OHWM included an incised bed and bank, sediment sorting and debris wracking. Substrate consists of small cobbles, gravels, and fines. Although no flowing water was observed, much of the substrate was covered with algal matting. Vegetation along S7 consists of bulbous bluegrass (*Poa bulbosa*), cheatgrass (*Bromus tectorum*), smallflower woodland-star (*Lithophragma parviflorum*), barestem biscuitroot (*Lomatium nudicaule*), and Hood River milk-vetch (*Astragalus hoodianus*).

4.2 S8

Feature S8 is identified as a perennial watercourse in both the NHD and NWI datasets that is located near the upper reservoir. However, based on observations during the May 2019 wetland and waters delineation this feature is an ephemeral stream channel that is 12 to 24 inches wide, 1 to 3 inches deep, and extends approximately 990 feet into the study area; the NHD and NWI show this feature about 770 feet shorter than the extent mapped by ERM. Evidence of an OHWM included an incised bed and bank, sediment sorting, and debris wracking. Substrate consists of small cobbles, gravels, and fines. Although no flowing water was observed, several pockets of standing water were observed and much of the substrate was covered with algal matting. Vegetation along S8 is similar to the species described along S7.

4.3 P1

Feature P1 is identified as a perennial pond in both the NHD and NWI datasets that is located in the northern portion of the study area. The pond appears to be artificially created in uplands to support cattle grazing on the surrounding property; there is no outlet or channel connecting it to S7. At the time of the May 2019 delineation, the pond appeared to be nearly full. Unidentified emergent vegetation was observed growing sparsely in about 1 to 2 feet of standing water. Review of Google Earth aerial imagery suggests that the pond partially dries up but retains a small amount of water throughout the year. The pond is approximately 0.2 acre in size, of which approximately 0.001 acre is within the study area.

4.4 P2

Feature P2 is identified as a perennial pond in the in the NHD; however, it is not included in the NWI dataset. The pond is located near the northern portion of the study area and appears to be artificially created in uplands to support cattle grazing on the surrounding property. Like P1, P2

does not have an outlet or channel connecting it to S7. At the time of the May 2019 delineation, the pond appeared to be about half full. The edges of the pond are largely unvegetated and no emergent vegetation was observed growing within the water. Review of Google Earth aerial imagery suggests that the pond dries up annually. The pond is approximately 0.03 acre in size.

4.5 S17

Feature S17 is identified as an intermittent watercourse in both the NHD and NWI datasets that crosses Highway 14 near the lower reservoir. Additionally, the NWI identifies a palustrine shrub-scrub wetland immediately upslope of the highway. Field observations during the May 2019 delineation confirmed this feature is an intermittent stream channel; however, there is no shrub-scrub wetland present. The stream channel is about 24 inches wide and 1 to 3 inches deep, with substrate consisting of mud and fine gravels. Evidence of an OHWM included a defined bed and bank and sediment sorting. The channel begins above the highway and is conveyed beneath the highway through a metal culvert. Flowing water 1 to 3 inches deep was observed above the highway; however, no water was observed exiting the culvert at the outlet on the southeast side of the highway. Below the culvert outlet, the stream channel extends only about 20 feet where it resembles a grassy swale that lacks the OHWM indicators observed above the highway. These conditions suggest the culvert may be damaged and that most of the stream flow goes subsurface beneath the highway before reaching the culvert outlet. Vegetation along S17 consists of netleaf hackberry (*Celtis reticulata*), Himalayan blackberry (*Rubus armeniacus*), seep monkeyflower (*Mimulus guttatus*), bedstraw (*Galium* sp.), bulbous bluegrass, and cheatgrass.

4.6 S24

Feature S24 is not identified in either the NHD or NWI datasets, but appears to groundwater seep located along the excavated hillside above Highway 14 near the lower reservoir. Water flows down the hillside into a roadside drainage ditch and into a culvert that conveys the water to east side of the highway. Similar to S17, no flowing water was observed existing the culvert outlet. Vegetation within the seep consists primarily of Himalayan blackberry and black cottonwood (*Populus trichocarpa*) saplings.

4.7 W6

W6 is a palustrine, emergent wetland associated with a seep on a hillslope roadcut along Highway 14. Vegetation observed in wetland feature W6 included seep monkeyflower (*Mimulus guttatus*, OBL). Adjacent to the wetland feature in the riparian corridor surrounding the S17 channel vegetation included tree and shrub netleaf hackberry (*Celtis reticulata*, FAC) and Himalayan blackberry (*Rubus armeniacus*, FAC). Additional species observed in and adjacent to S17 and W6 included bedstraw (*Galium* sp., FACU-UPL), dock (*Rumex* sp., generally FACW), bulbous bluegrass (*Poa bulbosa*, FACU), cheatgrass (*Bromus tectorum*, UPL), milkweed (*Asclepias* sp., FAC-UPL), and blue wildrye (*Elymus glaucus*, FACU). Soil pits were not

excavated in the W6 wetland due to flowing and standing water within the feature and plot. Additionally, the seep is located on an old roadbed consisting of compacted rock and gravel, which could not be excavated. Therefore hydric soil is assumed present. Hydrology in the wetland was observed as flowing and standing water. The wetland does not appear to have a surface connection to S17 located about 70 feet downslope.

Table 4-7-1: Wetland and Water Features Confirmed in 2019 Delineation in the Proposed Project Boundary

ID	NWI	NHD	Clean Water Act Jurisdiction (2019 Field Confirmation)
S7	R5UBH	Perennial	Likely a jurisdictional waterbody. Ephemeral stream connects to Swale Creek, a perennial tributary of the Klickitat River, approximately 2.4 miles north of the survey area.
S8	R5UBH	Perennial	Likely a jurisdictional waterbody. Ephemeral stream connects to Swale Creek, a perennial tributary of the Klickitat River, approximately 2.4 miles north of the survey area.
P1	PUBHx	Perennial	Likely not jurisdictional. Pond is artificially created in uplands and appears to be isolated as it does not have an outlet or surface connection to feature S7.
P2	Not mapped	Perennial	Likely not jurisdictional. Pond is artificially created in uplands and appears to be isolated as it does not have an outlet or surface connection to feature S7.
S17	R4SBC & PSS1A	Intermittent	Likely not jurisdictional. Stream lacks a surface connection to the Columbia River as most of the stream flow goes subsurface near Highway 14.
S24	Not mapped	Not mapped	Likely not jurisdictional. Seep lacks a surface connection to the Columbia River as most of the flow goes subsurface near Highway 14.
W6	Not Mapped	Not mapped	Likely not jurisdictional. Wetland appears to be isolated and does not have a surface connection to S17.

5.0 CONCLUSIONS

Based on the observations described above from field investigations conducted in May 2019, ERM identified one wetland and six waterbodies existing within the study area.

Two of the six waterbodies within the study area, S7 and S8 are likely jurisdictional waters of the U.S. as they connect to perennial streams downstream of the project area and therefore are subject to regulation under Section 404 of the federal Clean Water Act. The remaining four waterbodies and one wetland are likely not jurisdictional waters of the U.S because they appear to be isolated and do not connect to the Columbia River.

6.0 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. Department of Interior, Fish and Wildlife Service, Washington, DC.
- Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. *The National Wetland Plant List: 2016 wetland ratings*. Phytoneuron 2016-30: 1-17. Published 28 April 2016. ISSN 2153 733X.

- USACE (U.S. Army Corps of Engineers). 1987. *USACE Wetland Delineation Manual*. Technical Report Y -87 -1. U.S. Army Waterways Experiment Station, Vicksburg, Mississippi.
- _____. 2005. *Ordinary High Water Mark Identification, Regulatory Guidance Letter 05-05*. December 7, 2005.
- _____. 2008. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)*. Washington, DC: U.S. Army Engineer Research and Development Center, Environmental Laboratory, ERDC/EL TR-08028.
- USDA (U.S. Department of Agriculture). 2009. *Munsell Soil Color Chart*. U.S Dept. Agriculture —Soil Survey Manual, 2009 Edition, Munsell Soil Chart Brochure.
- _____. 2018. *Field Indicators of Hydric Soils in the United States: A Guide for Identifying and Delineating Hydric Soils* (version 8.2, 2018; including revisions to versions 8.0 and 8.1).
- USDA/NRCS (U.S. Department of Agriculture National Resource Conservation Service). 2019. Soil Survey Geographic (SSURGO) database for Klickitat County Area, Washington. Accessed September 2019.
https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/?cid=nrcs142p2_053627
- USFWS (U.S. Fish and Wildlife Service). 2019. *National Wetland Inventory*. Accessed May 2019. <https://www.fws.gov/wetlands/data/data-download.html>.
- USGS (U.S. Geological Survey). 2019. *National Hydrography Data Set*. Accessed January 2019. <https://water.usgs.gov/GIS/huc.html>.

ATTACHMENT 1:

WETLAND DETERMINATION DATA FORMS

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Goldendale Pumped Storage Project City/County: Goldendale / Klickitat County Sampling Date: 5/14/19
 Applicant/Owner: Rye Development State: WA Sampling Point: DP-1
 Investigator(s): Justin Moffett, Carissa Shoemaker Section, Township, Range: S18, T03N, R17E
 Landform (hillslope, terrace, etc.): draw/swale Local relief (concave, convex, none): concave Slope (%): 10
 Subregion (LRR): B - Columbia/Snake River Plateau Lat: 45.745335 Long: -120.730051 Datum: WGS84
 Soil Map Unit Name: Lorena-Rockly complex, 30-65 percent slopes NWI classification: R5UBH

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation 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 <input type="radio"/> No <input checked="" type="radio"/> Hydric Soil Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	Is the Sampled Area within a Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/>
Remarks: <u>Plot located in swale exhibiting non-hydrophytic vegetation and non-hydric soils. No evidence of an ordinary high water mark observed.</u>	

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:	
1. <u>None</u>				Number of Dominant Species That Are OBL, FACW, or FAC:	<u>0</u> (A)
2.				Total Number of Dominant Species Across All Strata:	<u>2</u> (B)
3.				Percent of Dominant Species That Are OBL, FACW, or FAC:	<u>0.0 %</u> (A/B)
4.					
Total Cover: <u> </u> %					
Sapling/Shrub Stratum				Prevalence Index worksheet:	
1. <u>Rosa sp.</u>	<u>2</u>	<u>Yes</u>	<u>FACU</u>	Total % Cover of:	Multiply by:
2.				OBL species	<u> </u> x 1 = <u>0</u>
3.				FACW species	<u> </u> x 2 = <u>0</u>
4.				FAC species	<u>5</u> x 3 = <u>15</u>
5.				FACU species	<u>37</u> x 4 = <u>148</u>
Total Cover: <u>2</u> %				UPL species	<u>27</u> x 5 = <u>135</u>
				Column Totals:	<u>69</u> (A) <u>298</u> (B)
				Prevalence Index = B/A = <u>4.32</u>	
Herb Stratum				Hydrophytic Vegetation Indicators:	
1. <u>Poa bulbosa</u>	<u>30</u>	<u>Yes</u>	<u>FACU</u>	<input checked="" type="checkbox"/> Dominance Test is >50%	
2. <u>Lomatium nudicaule</u>	<u>5</u>	<u>No</u>	<u>UPL</u>	<input checked="" type="checkbox"/> Prevalence Index is ≤3.0 ¹	
3. <u>Achillea millefolium</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	<input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)	
4. <u>Lithophragma parviflorum</u>	<u>10</u>	<u>No</u>	<u>UPL</u>	<input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)	
5. <u>Poa sp.*</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology must be present.	
6. <u>Bromus tectorum</u>	<u>2</u>	<u>No</u>	<u>UPL</u>		
7. <u>Eriogonum compositum</u>	<u>10</u>	<u>No</u>	<u>UPL</u>		
8. <u>Taraxacum officinale</u>	<u>2</u>	<u>No</u>	<u>FACU</u>		
Total Cover: <u>67</u> %					
Woody Vine Stratum				Hydrophytic Vegetation Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	
1. <u>None</u>					
2.					
Total Cover: <u> </u> %					
% Bare Ground in Herb Stratum <u>20 %</u>		% Cover of Biotic Crust <u>20 %</u>			

Remarks: *Assuming the unidentified species is FAC to be conservative.

SOIL

Sampling Point: DP-1

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

Depth (inches)	Matrix		Redox Features				Texture ³	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-8	10YR 3/3	100	NA				silt loam	
8-11	10YR 3/3	98	10YR 4/4	2	C	M	silt loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix. ²Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
³Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

<p>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</p> <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) (LRR C) <input type="checkbox"/> 1 cm Muck (A9) (LRR D) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> Vernal Pools (F9)	<p>Indicators for Problematic Hydric Soils:⁴</p> <input type="checkbox"/> 1 cm Muck (A9) (LRR C) <input type="checkbox"/> 2 cm Muck (A10) (LRR B) <input type="checkbox"/> Reduced Vertic (F18) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Other (Explain in Remarks)
--	---	--

⁴Indicators of hydrophytic vegetation and wetland hydrology must be present.

<p>Restrictive Layer (if present): Type: <u>Rock/cobble</u> Depth (inches): <u>11"</u></p>	<p>Hydric Soil Present? Yes <input type="radio"/> No <input checked="" type="radio"/></p>
<p>Remarks: <u>1-3" round rock/cobble throughout profile</u></p>	

HYDROLOGY

<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators (any one indicator is sufficient)</p> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) (Nonriverine) <input type="checkbox"/> Sediment Deposits (B2) (Nonriverine) <input type="checkbox"/> Drift Deposits (B3) (Nonriverine) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Salt Crust (B11) <input checked="" type="checkbox"/> Biotic Crust (B12) <input type="checkbox"/> Aquatic Invertebrates (B13) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Plowed Soils (C6) <input type="checkbox"/> Other (Explain in Remarks)	<p>Secondary Indicators (2 or more required)</p> <input type="checkbox"/> Water Marks (B1) (Riverine) <input type="checkbox"/> Sediment Deposits (B2) (Riverine) <input type="checkbox"/> Drift Deposits (B3) (Riverine) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> FAC-Neutral Test (D5)
---	--	---

<p>Field Observations:</p> <p>Surface Water Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): <u>N/A</u></p> <p>Water Table Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): <u>>11"</u></p> <p>Saturation Present? (includes capillary fringe) Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): <u>>11"</u></p>	<p>Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/></p>
--	--

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

Remarks: Algal matting present in swale.
Soil dry and crumbly, low soil moisture.

SOIL

Sampling Point: DP-2

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

Depth (inches)	Matrix		Redox Features				Texture ³	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	10YR 3/3	100	NA				silt loam	
3-10	10YR 3/2	100	NA				silt loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix. ²Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
³Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) (LRR C) <input type="checkbox"/> 1 cm Muck (A9) (LRR D) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> Sandy Gleyed Matrix (S4)		<input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> Vernal Pools (F9)	Indicators for Problematic Hydric Soils:⁴ <input type="checkbox"/> 1 cm Muck (A9) (LRR C) <input type="checkbox"/> 2 cm Muck (A10) (LRR B) <input type="checkbox"/> Reduced Vertic (F18) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Other (Explain in Remarks)
--	--	---	--

Restrictive Layer (if present): Type: <u>Large cobble</u> Depth (inches): <u>10"</u>	Hydric Soil Present? Yes <input type="radio"/> No <input checked="" type="radio"/>
Remarks:	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (any one indicator is sufficient)	Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) (Nonriverine) <input type="checkbox"/> Sediment Deposits (B2) (Nonriverine) <input type="checkbox"/> Drift Deposits (B3) (Nonriverine) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Salt Crust (B11) <input checked="" type="checkbox"/> Biotic Crust (B12) <input type="checkbox"/> Aquatic Invertebrates (B13) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Plowed Soils (C6) <input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Water Marks (B1) (Riverine) <input type="checkbox"/> Sediment Deposits (B2) (Riverine) <input type="checkbox"/> Drift Deposits (B3) (Riverine) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations: Surface Water Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): <u>N/A</u> Water Table Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): <u>>10"</u> Saturation Present? (includes capillary fringe) Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): <u>>10"</u>	Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>
---	---

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

Remarks: Beginning of channel, poorly defined bed and bank.

SOIL

Sampling Point: DP-3

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

Depth (inches)	Matrix		Redox Features				Texture ³	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-12	10YR 3/3	100	NA				silt loam	
12-15	10YR 3/2	100	NA				silt loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix. ²Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
³Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

<p>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</p> <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) (LRR C) <input type="checkbox"/> 1 cm Muck (A9) (LRR D) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> Vernal Pools (F9)	<p>Indicators for Problematic Hydric Soils:⁴</p> <input type="checkbox"/> 1 cm Muck (A9) (LRR C) <input type="checkbox"/> 2 cm Muck (A10) (LRR B) <input type="checkbox"/> Reduced Vertic (F18) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Other (Explain in Remarks)
--	---	--

⁴Indicators of hydrophytic vegetation and wetland hydrology must be present.

<p>Restrictive Layer (if present): Type: <u>None found</u> Depth (inches): _____</p>	<p>Hydric Soil Present? Yes <input type="radio"/> No <input checked="" type="radio"/></p>
<p>Remarks: _____</p>	

HYDROLOGY

<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators (any one indicator is sufficient)</p> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) (Nonriverine) <input type="checkbox"/> Sediment Deposits (B2) (Nonriverine) <input type="checkbox"/> Drift Deposits (B3) (Nonriverine) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Salt Crust (B11) <input type="checkbox"/> Biotic Crust (B12) <input type="checkbox"/> Aquatic Invertebrates (B13) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Plowed Soils (C6) <input type="checkbox"/> Other (Explain in Remarks)	<p><u>Secondary Indicators (2 or more required)</u></p> <input type="checkbox"/> Water Marks (B1) (Riverine) <input type="checkbox"/> Sediment Deposits (B2) (Riverine) <input type="checkbox"/> Drift Deposits (B3) (Riverine) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> FAC-Neutral Test (D5)
---	---	---

<p>Field Observations:</p> <p>Surface Water Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): <u>N/A</u></p> <p>Water Table Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): <u>>15"</u></p> <p>Saturation Present? (includes capillary fringe) Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): <u>>15"</u></p>	<p>Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/></p>
--	--

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

Remarks: Plot located approximately 2 feet above edge of pond.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Goldendale Pumped Storage Project City/County: Goldendale / Klickitat County Sampling Date: 5/15/19
 Applicant/Owner: Rye Development State: WA Sampling Point: DP-4
 Investigator(s): Justin Moffett, Carissa Shoemaker Section, Township, Range: S19, T03N, R17E
 Landform (hillslope, terrace, etc.): roadcut terrace Local relief (concave, convex, none): convex Slope (%): 1
 Subregion (LRR): B - Columbia/Snake River Plateau Lat: 45.728751 Long: -120.723742 Datum: WGS84
 Soil Map Unit Name: Rock outcrop-Rubble land-Haploxerolls complex, 30-90 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation 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 <input checked="" type="radio"/> No <input type="radio"/> Hydric Soil Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="radio"/> No <input type="radio"/>
Remarks: <u>Wetland located in abandoned road bed. Groundwater flowing from excavated hillside associated with abandoned road provides wetland hydrology.</u>	

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:	
1. <u>None</u>				Number of Dominant Species That Are OBL, FACW, or FAC:	<u>1</u> (A)
2. _____				Total Number of Dominant Species Across All Strata:	<u>1</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC:	<u>100.0 %</u> (A/B)
4. _____				Prevalence Index worksheet:	
Total Cover: _____ %				Total % Cover of: _____ Multiply by: _____	
Sapling/Shrub Stratum				OBL species	<u>90</u> x 1 = <u>90</u>
1. <u>None</u>				FACW species	_____ x 2 = <u>0</u>
2. _____				FAC species	<u>10</u> x 3 = <u>30</u>
3. _____				FACU species	_____ x 4 = <u>0</u>
4. _____				UPL species	_____ x 5 = <u>0</u>
5. _____				Column Totals:	<u>100</u> (A) <u>120</u> (B)
Total Cover: _____ %				Prevalence Index = B/A = <u>1.20</u>	
Herb Stratum				Hydrophytic Vegetation Indicators:	
1. <u>Mimulus guttatus</u>	<u>90</u>	<u>Yes</u>	<u>OBL</u>	<input checked="" type="checkbox"/> Dominance Test is >50%	
2. <u>Rubus armeniacus</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	<input checked="" type="checkbox"/> Prevalence Index is ≤3.0 ¹	
3. _____				<input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)	
4. _____				<input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)	
5. _____				¹ Indicators of hydric soil and wetland hydrology must be present.	
6. _____				Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	
7. _____					
8. _____					
Total Cover: <u>100%</u>					
Woody Vine Stratum					
1. <u>None</u>					
2. _____					
Total Cover: _____ %					
% Bare Ground in Herb Stratum <u>0 %</u>		% Cover of Biotic Crust <u>0 %</u>			

Remarks:

SOIL

Sampling Point: DP-4

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

Depth (inches)	Matrix		Redox Features				Texture ³	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix. ²Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
³Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) (LRR C) <input type="checkbox"/> 1 cm Muck (A9) (LRR D) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> Sandy Gleyed Matrix (S4)		<input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> Vernal Pools (F9)		Indicators for Problematic Hydric Soils:⁴ <input type="checkbox"/> 1 cm Muck (A9) (LRR C) <input type="checkbox"/> 2 cm Muck (A10) (LRR B) <input type="checkbox"/> Reduced Vertic (F18) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Other (Explain in Remarks)
--	--	---	--	--

⁴Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):
 Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks: No soil pit dug due to presence of compacted rock roadbed substrate. Hydric soil is assumed present based on presence of hydrophytic vegetation and wetland hydrology.

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (any one indicator is sufficient)		Secondary Indicators (2 or more required)	
<input checked="" type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) (Nonriverine) <input type="checkbox"/> Sediment Deposits (B2) (Nonriverine) <input type="checkbox"/> Drift Deposits (B3) (Nonriverine) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Salt Crust (B11) <input type="checkbox"/> Biotic Crust (B12) <input type="checkbox"/> Aquatic Invertebrates (B13) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Plowed Soils (C6) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Water Marks (B1) (Riverine) <input type="checkbox"/> Sediment Deposits (B2) (Riverine) <input type="checkbox"/> Drift Deposits (B3) (Riverine) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:

Surface Water Present?	Yes <input checked="" type="radio"/>	No <input type="radio"/>	Depth (inches):	0"
Water Table Present?	Yes <input checked="" type="radio"/>	No <input type="radio"/>	Depth (inches):	0"
Saturation Present? (includes capillary fringe)	Yes <input checked="" type="radio"/>	No <input type="radio"/>	Depth (inches):	0"

Wetland Hydrology Present? Yes No

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

Remarks: Flowing water observed within wetland. Water originates from hillside seep located immediately upslope of wetland

ATTACHMENT 2:
PHOTOGRAPH LOG



Photo 1: DP-1 Vegetation, Looking South



Photo 2: DP-1 Soil Pit



Photo 3: DP-2, Near Beginning of S7. Vegetation, Looking North



Photo 4: DP-2 Soil Pit



Photo 5: DP-3 (at P1) Vegetation, Looking East



Photo 6: DP-3 (at P1) Soil Pit



Photo 7: S17 Intermittent Stream, Looking West



Photo 8: W6 Wetland with Seep, Looking Southwest



Photo 9: S17 at Culvert Outlet Located below Highway 14, Looking West



Photo 10: S24, Looking Southwest



Photo 11: S24, Looking Northeast



Photo 12: P2

Goldendale Pumped Storage Project
Goldendale, WA
June 2019





Photo 13: S7, Looking North



Photo 14: S7 Width Measurement



Photo 15: S8, Looking North



Photo 16: S8, Looking South