CRITICAL AREAS ASSESSMENT REPORT

Wetland Delineation and Conceptual Mitigation Plan Westside Solar Site Cle Elum, WA

Prepared by:

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Acronyms and Abbreviations

BMP	best management practice
BPJ	best professional judgment
CAO	critical areas ordinance
Ecology	Washington State Department of Ecology
FGDC	Federal Geographic Data Committee (formerly Cowardin)
HGM	Hydrogeomorphic (Classification System)
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
PEM	palustrine emergent
TMDL	total maximum daily load
T&E	Threatened and Endangered Species
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
WDNR	Washington Department of Natural Resources
WDFW	Washington State Department of Fish and Wildlife
WRIA	Water Resource Inventory Area

Chapter 1. Introduction

This Critical Areas Assessment Report has been prepared to meet requirements for wetland determinations according to U.S. Army Corps of Engineers guidelines (USACE 2008). The report contains descriptions of project area natural resources, including wetlands, wildlife species and habitats, and Threatened and Endangered (T&E) species. An impact assessment and conceptual mitigation plan are also included below. Two wetlands were delineated on the proposed site.

Information gathered in this report assists project designers in avoiding and/or minimizing impacts to sensitive areas and species; provides information for regulatory reviewers; and provides information for mitigation reports if needed. The report is anticipated to support review by Kittitas County, U.S. Army Corps of Engineers (USACE), and/or the Washington State Department of Ecology (Ecology), and Washington State Department of Fish and Wildlife.

Chapter 2. Proposed Project

2.1 Location

This project property is located in Kittitas County near Cle Elum, WA (Figure 1). The site is bounded by mixed forest to the south, rural residences to the east and west, and the Iron Horse state park trail to the north. The project is located across six parcels (Kittitas County Tax Parcel Numbers 19440, 19441, 19442, 10577, 10579, and 10580) totaling approximately 46 acres, specifically located within portions of Township 20 North, Range 15 East, Section 33, W.M.

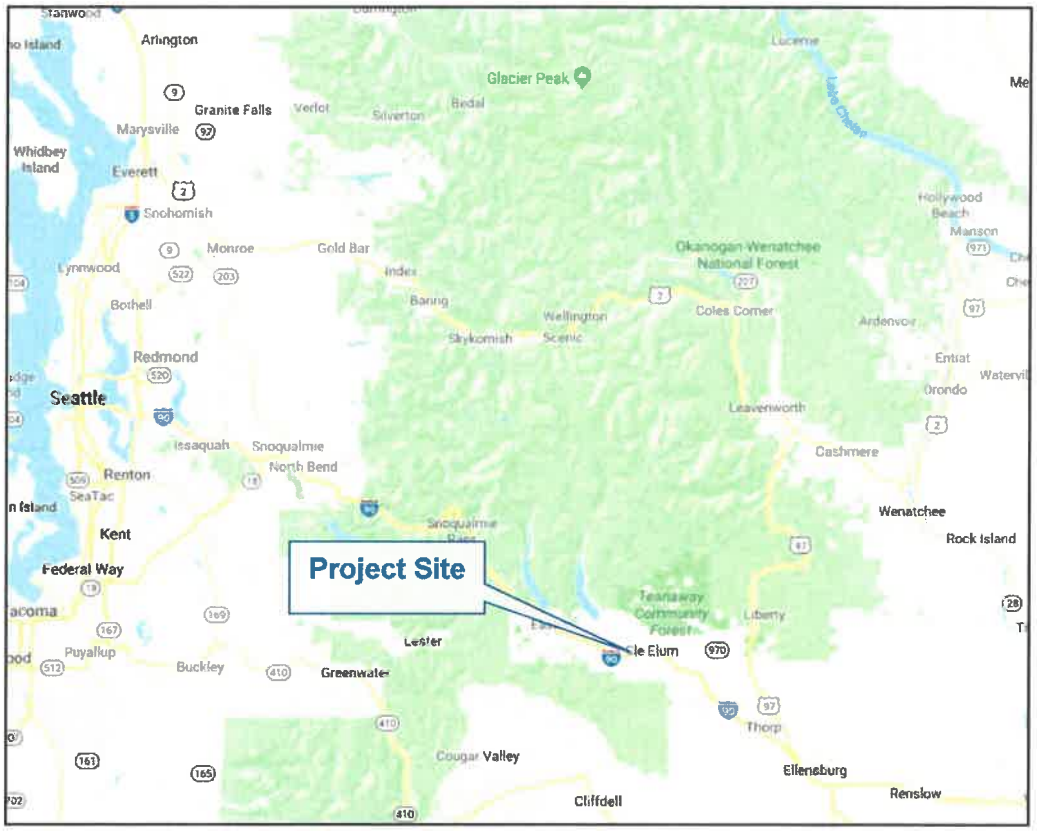

Figure 1. Project Vicinity Map.

2.2 Purpose and Description

The purpose of this document is to satisfy Kittitas County regulations that require a Critical Areas site assessment according to KCC (Kittitas County Code) 17A.04.010. The project proposes to build a solar power production facility on the site.

Chapter 3. Methods

3.1 Wetland Identification, Delineation, and Classification

Hamer Environmental biologist, Kristin Murray, delineated wetlands according to local, state, and federal guidelines throughout the entire property (Appendix A). Wetland boundaries were surveyed using GPS. Wetland size for wetland outside the property or project area were estimated using aerial photos and ArcGIS 10.6.

Wetland resources were delineated using guidelines and methods described in the *U.S. Army Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987) as amended with the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast (Version 2.0)* (USACE 2010).

Biologists used several tools to identify and classify plants and soils examined within the investigated area. Plant indicator status and scientific plant names were identified using the *National Wetland Plant List: 2014 Update of Wetland Ratings* (Lichvar et al. 2014) and any updates to the *National Wetland Plant List* (USACE 2016). Soil characteristics were recorded and classified using the *Field Book for Describing and Sampling Soils* (USDA, NRCS 2012). Hydric soil conditions were assessed using *Field Indicators of Hydric Soils in the United States, Version 8.1* (USDA, NRCS 2017).

Wetlands delineated were classified according to federal, state, and local systems. The *Classification of Wetlands and Deepwater Habitats of the United States* [Federal Geographic Data Committee (FGDC) 2013] is a descriptive classification, based on physical attributes (i.e., plant community, soils, and water regime). Wetlands perform a variety of biological, physical (hydrologic), and chemical (water quality) functions. For this project, each wetland was assigned a hydrogeomorphic (HGM) classification to more accurately assess impacts and determine appropriate wetland restoration or mitigation (Brinson 1993). Functions and values for wetlands within the project vicinity were classified under HGM and evaluated using the Washington State Wetland Rating System for Western Washington (Hruby 2014). Ecology divides wetlands into four hierarchical categories based on specific attributes such as rarity, sensitivity to disturbance, and functions (Hruby 2014). The Ecology classification hierarchy ranges from Category I wetlands, which exhibit outstanding features (rare wetland type, relatively undisturbed or a high sensitivity to disturbance, and high level of functions) to Category IV wetlands, which have the lowest levels of function and are often heavily disturbed.

Kittitas County regulates wetlands and streams according to their critical areas ordinance [(CAO) (Kittitas County 1994)]. Wetlands were classified, and buffers assigned according to the Kittitas County CAO (KCC 17.04). Kittitas County classifies wetlands in Section 17A.02.310 into four categories: Category I (extreme high value), Category II (high value), Category III (average value), and Category IV (less than average value) and references the Washington rating system (KCC 17A.03.025). According to Kittitas County (1994), buffers are determined by the overall intensity of the proposed use, the presence of threatened, endangered, or sensitive species, the site's susceptibility to severe erosion, and the use of a buffer enhancement plan by the applicant (KCC 17A.04.025).

Washington State Administrative Code (WAC) designates four water types in the Forest Practices Rules administered by the Washington State Department of Natural Resources (WDNR): Type S waters are designated shorelines of the state, Type F waters provide fish habitat, Type Np waters are perennial non-fish bearing streams, and Type Ns waters are seasonal non-fish bearing streams (WAC 222-16-030). Kittitas County protects Fish and Wildlife

Habitat Conservation Areas, which include any waters of the state as defined by the Washington Administrative Code (WAC 222-16-030). Performance based buffer widths are assigned by: proposed land intensity use, presence of endangered or threatened species, susceptibility to erosion/channel instability/aggrading, use of a buffer enhancement plan, and width of the river.

Also, the condition of buffers was qualitatively assessed using the following criteria:

- Dominant buffer vegetation type (tree, shrub, herb, vine, un-vegetated).
- Type and estimated percent cover of invasive species.
- Dominant land use (e.g., agriculture, residential, commercial, industrial)

3.2 Wetlands and Waters of the State Definitions and Regulatory Requirements

Waters of the United States: "All waters that are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; All interstate waters including interstate wetlands; All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation, or destruction of which could affect interstate or foreign commerce...Wetlands adjacent to waters (other than waters that are themselves wetlands) identified above." (Definition taken from 33 CFR, Part 328.3). "Adjacent" is defined as bordering, contiguous, or neighboring.

Wetlands: "Areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." (Definition taken from 33 CFR, Part 328.3).

Limits of jurisdiction in nontidal waters:

- in the absence of adjacent wetlands, the jurisdiction extends to the ordinary high-water mark;
- when adjacent wetlands are present, the jurisdiction extends beyond the ordinary high-water mark to the limit of the adjacent wetlands;
- when the Water of the United States consists only of wetlands, the jurisdiction extends to the limit of the wetland (taken from 33 CFR, Part 328.3).

Regulatory Requirements:
Wetlands/waters of the state are under the jurisdiction of the Army Corps of Engineers (Corps), state, and local agencies. The Corps has the authority to determine whether a wetland or stream is a water of the U.S. and thus federally regulated under Section 404 of the Clean Water Act (CWA).

This site falls under local jurisdiction of Kittitas County. Kittitas County Code regulates land use activities such as filling and draining of wetlands, building permits, conversion of forest land to non-forest use, rezones, short and long plats, and shoreline permits (KCC 17A.03.015).

Chapter 4. Existing Conditions

4.1 Landscape Setting

Within the project vicinity, land use is primarily open fields with scattered young, mixed deciduous and coniferous forest along stream and low-density rural residences. Intensive land management such as cattle grazing, irrigation development, and mining began in the late 1800's which led to a dramatic decrease in historic salmonid populations throughout the Yakima Basin. Many of the irrigation diversions and storage reservoirs that were constructed at this time were built without upstream fish passage facilities (WSCC 2001).

4.1.1 Watershed Description

The proposed project is located within the Upper Yakima River watershed (WRIA 39), specifically within the Crystal Creek sub watershed (Ecology 2016). Surface water originates from snowmelt and several high mountain reservoirs and lakes within the watershed. Historically, significant instream flow modifications have been implemented that have diverted water into irrigation ditches and reservoirs ultimately reducing the quantity of water throughout the basin in drier months of the year (WSCC 2001). The Yakima River, Tillman Creek, and the unnamed stream along the western edge of the property are mapped as potential salmonid spawning, rearing, and migration habitat (WDOE 2016).

No streams are mapped on the property. The Yakima River is mapped approximately 0.50 miles north of the site, Tillman Creek is approximately 1,300 feet from the west side of the property, and a small unnamed stream is directly (about 20 feet at its closest point) on the western boundary according to WDNR water type maps. The closest stream is mapped a Type NP/Type 4 up to the pond at which point it becomes Type F/Type 3 (WDNR 2019a). A stream feature that is not mapped is located along the southern edge of Wetland 1. The western portion appears to be a seasonal feature that was beginning to dry up at our May 2019 site visit. The eastern portion appears to be permanently flowing where it picks up a significant flow from a stormwater culvert under Westside Road.

4.1.2 Vegetation

The entire project lies within the grand fir and Douglas fir zone of eastern Washington which is dominated by three forest species: Douglas fir (*Pseudotsuga menziesii*), Grand fir (*Abies grandis*), and ponderosa pine (*Pinus ponderosa*) (Franklin and Dyrness 1988). Within the project area, most of the forested vegetation is dominated by quaking aspen (*Populus tremuloides),* black cottonwood (*Populus balsamifera*), and red alder (*Alnus* rubra) with an understory dominated by western crabapple (*Malus fusca*), oceanspray (*Holodiscus discolor*), serviceberry (*Amelanchier alnifolia*), red-osier dogwood (*Cornus alba*), common snowberry (*Symphoricarpos albus*), and Himalayan blackberry (*Rubus armeniacus*) along the southern edge of the property. Scattered forested vegetation in the northeast corner of the site is dominated by ponderosa pine with an antelope bitterbrush (*Purshia tridentate*), common snowberry, Oregon grape *(Mahonia aquifolium*), lupine, and bulbous bluegrass (*Poa bulbosa*). DNR Natural Heritage Information System has no records of rare plants, high quality wetlands, or ecosystems in the project vicinity (WDNR 2019b).

4.1.3 Climate and Precipitation

Climate in the study area is largely affected by orographic cooling of moist maritime air passing over the Cascades from the Pacific Ocean which results in heavy precipitation in higher elevations near the crest, and a rain shadow to the east in lower elevation valleys. Winters are influenced by westerly winds from the coast, creating moderate winter temperatures with mixed rain and snow. Dry and hot conditions exist in the summer, when several weeks to months can

pass without measurable rainfall (WSCC 2001). Average annual precipitation in Cle Elum, Washington is about 23 inches (NRCS 2019).

Field work was conducted May 13th and 14th, 2019. Precipitation conditions were normal in the three months prior to field work. Drier than normal precipitation occurred the ten days prior to May 2019 fieldwork (Appendix B-1; NRCS 2018, 2019).

4.1.4 Soils

The local soil survey identifies four soils on the site, 201-Roslyn ashy sandy loam, 0 to 5 percent slopes; 205-Xerofluvents, 0 to 5 percent slopes, 207-Quicksell loam, 0 to 5 percent slopes, and 208-Patnish-Mippon-Myzel complex, 0-3 percent slopes. See the NRCS soil map below (Figure 2).

Table 1. Mapped soil summary.

Soil Symbol	Mapping Unit and Slope	Hydric?	General Soil Characteristics	Landform Position and Features
201	**Roslyn ashy sandy loam, 0 to 5 percent slopes.** Inclusions of Nard and Volperie. Included areas make up about 15% of mapping unit.	No.	*very deep, well drained, and moderate water storage *Water table at more than 80 inches *restrictive depth feature at more than 80 inches	Occurs on terraces. Parent material: glacial drift with a mantle of loess and volcanic ash
205	**Xerofluvents, 0 to 5 percent slopes.** Inclusions of Racker and Aquolls soils make up about 15% of mapping unit.	No. Inclusions of Aquolls are hydric and occur in wet alkali meadows.	*very deep, somewhat poorly drained *Water table at about 36 inches *restrictive depth feature at more than 80 inches	Occurs on flood plains and stream terraces. Parent material: Alluvium
207	**Quicksell loam, 0 to 5 percent slopes.** Inclusions of Swuak, Roslyn, and Teanaway make up about 20% of mapping unit.	No.	*moderately deep, somewhat excessively drained *Water table at about 5 to 15 inches *restrictive depth feature at 20 to 40 inches	Occurs on terraces. Parent material: Alluvium
208	**Patnish-Mippon-Myzel complex, 0-3 percent slopes.** Inclusions of Xerofluvents make up about 5% of mapping unit.	No.	Patnish: *moderately deep, moderately well drained *Water table at about 35 to 60 inches *restrictive depth feature at 25 to 35 inches Mippon: *moderately deep, moderately well drained *Water table at about 35 to 60 inches	Patnish: Occurs on flood plains. Parent materials: alluvium mixed with volcanic ash in the upper part Mippon: Occurs on stream terraces. Parent material: Alluvium Myzel: Occurs on alluvial fans and flood plains Parent materials: Alluvium with an influence of volcanic ash in the upper part

			*restrictive depth feature at 10 to 27 inches Myzel: *very deep, moderately well drained *Water table at 35-57 inches *restrictive depth feature at more than 80 inches	

4.2 Wetlands and Streams

The National Wetlands Inventory (NWI) map indicates one wetland on-site as a freshwater forested shrub wetland (Appendix A; Table 2; Figure 3). Two wetlands were delineated on-site with both extending off-site. Delineated wetlands contain forested, shrub, emergent and aquatic bed plant communities, and generally provide moderate levels of biological, chemical, and physical functions. There is also a man-made stormwater pond offsite and to the northeast of the subject property. Biologists completed field data sheets (Appendix B).

In addition to the onsite wetlands. An offsite stream is mapped to the west of the subject property, that drains into the ponded portion of Wetland 2. This stream is mapped as NP (non-fish bearing perennial/Type 4) up to the pond and then is designated F (fish-bearing/Type 3) at the pond (WDNR 2019b). There is also a previously unmapped stream flowing at the center of Wetland 1 that may be connected to the offsite stream at west.

Table 2. Wetlands and streams near the proposed project area.

Wetland/ stream	Wetland Classification			Wetland Size (acre)	Proposed Buffer Width (feet)[2]
	FGDC[1]	HGM	Ecology/ Local Jurisdiction		
1	PFO/PSS/PEM	Depressional open	I	~11.5	50
2	POW/PEM	Depressional open	II	~3.0	25
Unnamed Stream (west)	NA	NA	Type 3/Type 4	NA	40/20

[1]FGDC (formerly Cowardin) or NWI Class based on vegetation: PFO=Palustrine Forested, PSS=Palustrine Scrub-shrub, PEM=Palustrine Emergent, POW=Palustrine Open Water.
[2]Wetlands rated according to WDOE (Hruby 2014) and Kittitas County (1994) Critical Areas Ordinance. Buffers are based on low intensity land use and the use of buffer enhancement plans.

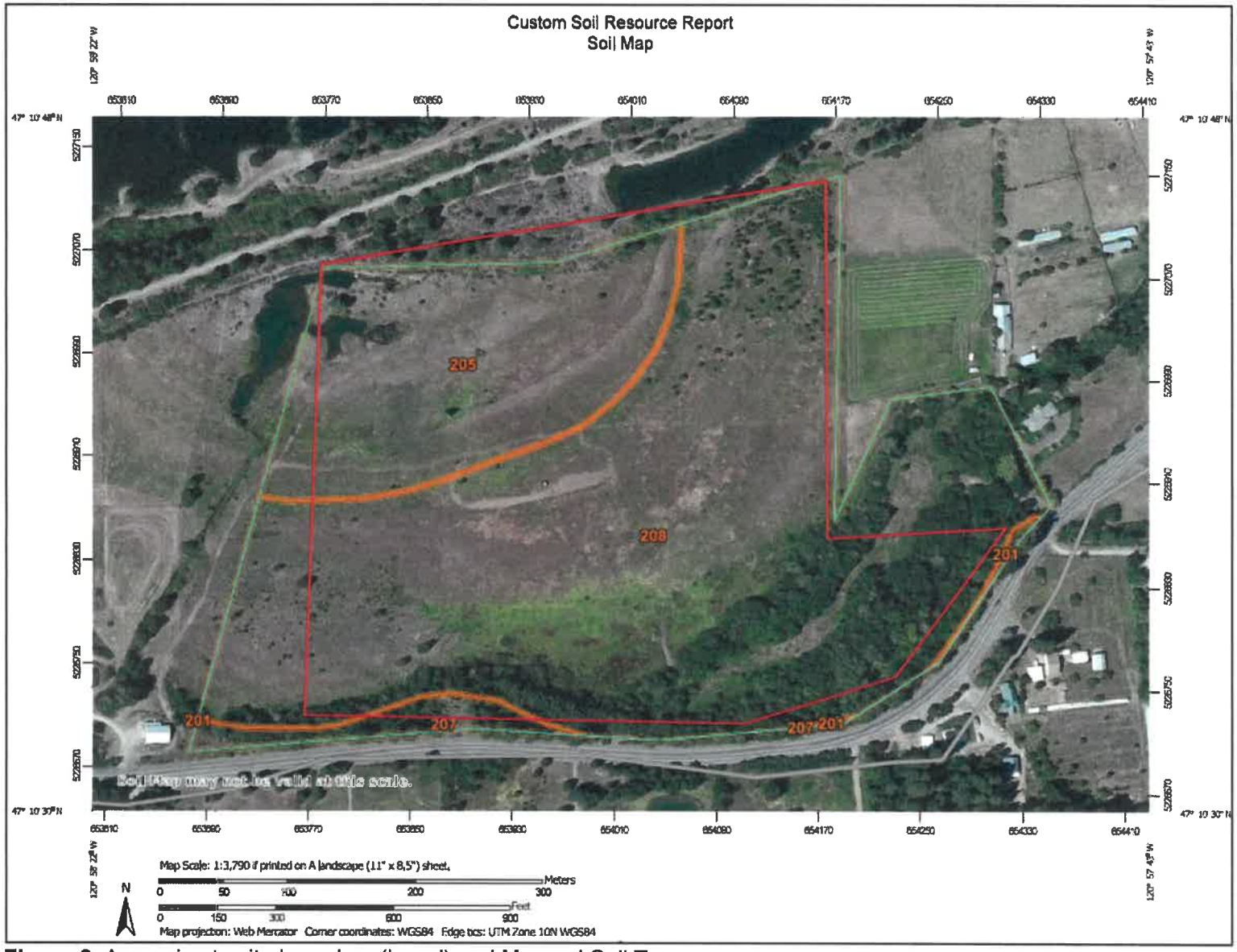

Figure 2. Approximate site boundary (in red) and Mapped Soil Types.

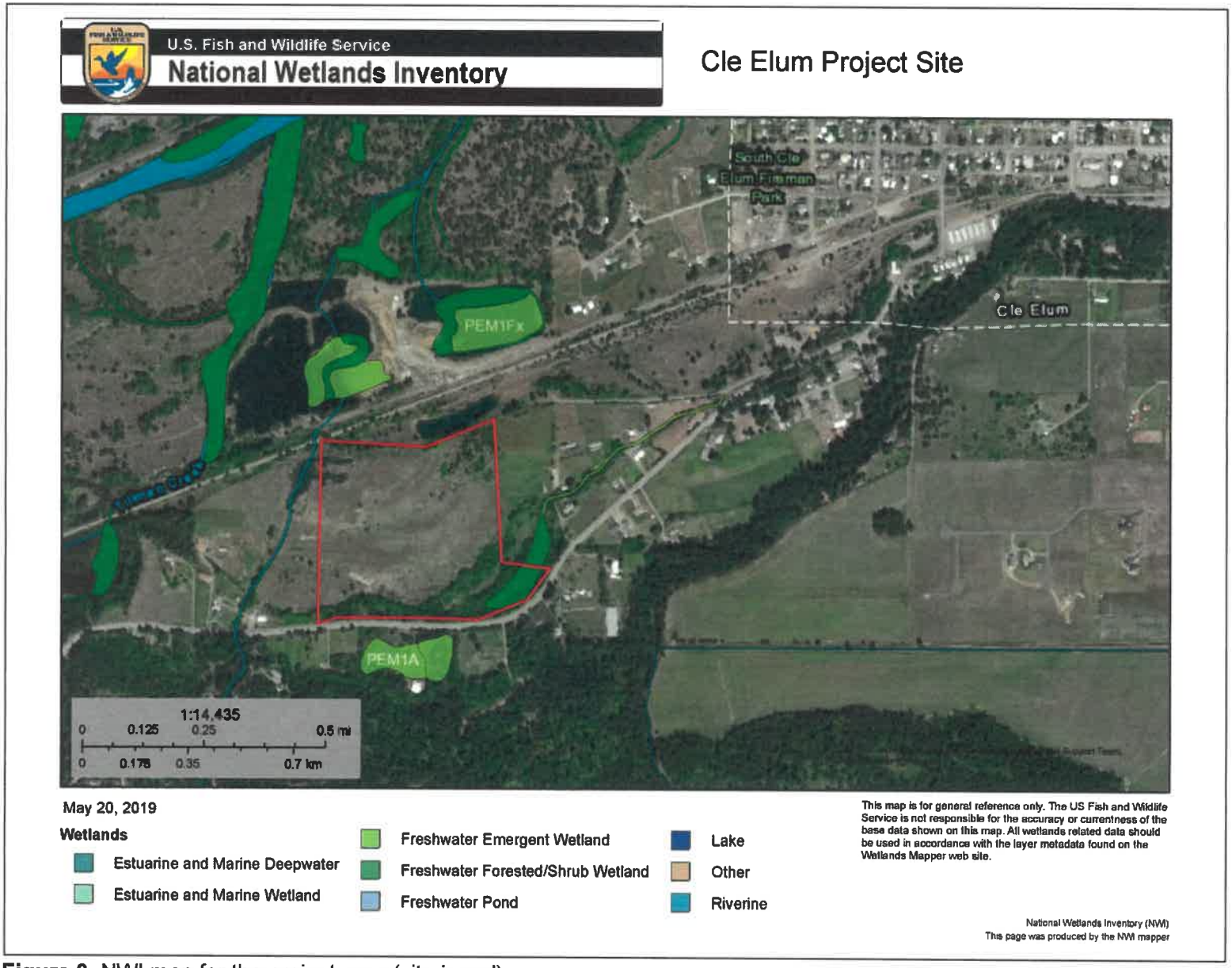

Figure 3. NWI map for the project area (site in red).

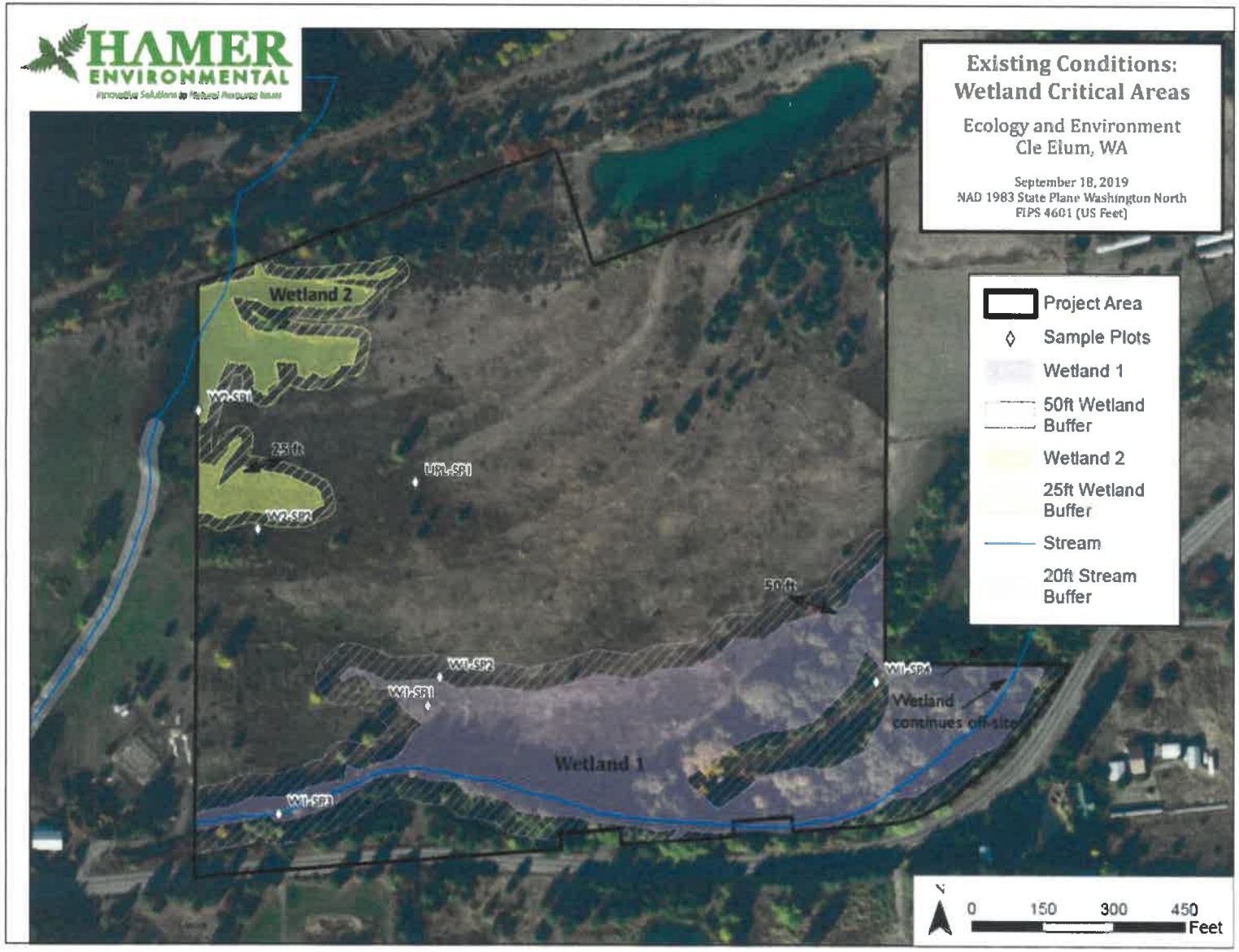

Figure 4. Overview of Wetlands 1 and 2 and streams within the study area.

4.2.1 Wetlands

Wetland 1
Wetland 1 is characterized as a palustrine forested (PFO) wetland with a palustrine scrub-shrub (PSS) understory and palustrine emergent wetland (PEM) area (FGDC 2013). It is situated in a distinct depression on the project site. The south edge of Wetland 1 abuts the road slope of Westside Road with the slope contributing water to the wetland as well as a defined channel that runs along the road slope. Wetland 1 was estimated to be about 11.5 acres in size and extends off-site to the east and west of the property.Delineated areas are dominated by forested and shrub vegetation including quaking aspen, red alder, Scouler's willow (*Salix scouleriana*), black twinberry (*Lonicera involucrate*), common snowberry, and Nootka rose (*Rosa nutkana*). Emergent area vegetation is dominated by field horsetail (*Equisetum arvense*), reed canarygrass (*Phalaris arundinacea)*, meadow foxtail (*Alopecurus pratensis*), stream violet (*Viola glabella)*, and Baltic rush (*Juncus balticus)* (Appendix B; Figure 5).

Hydric soils indicators for Depleted below Dark Surface (A11), Redox Dark Surface (F6), and Depleted Matrix (F3) were present. The soil profile generally consists of a very dark grey (10YR 3/1) silty clay loam from 0 to 10 inches with 20% strong brown (7.5YR 4/6) redoximorphic concentrations in pore linings and a grayish brown (10YR 5/2) silty clay loam from 10-16 inches with 25% dark grey (10YR 4/1) depletions in the matrix and 15% strong brown (7.5YR 4/6) redoximorphic concentrations in the matrix. Soils near the stream feature met the hydric soil indicators for Hydrogen sulfide (A4) and Muck (A10) and were a black (10YR 2/1) muck to a depth of 12-inches over a hardpan (Appendix B).

Normal precipitation conditions were present in the 3 months prior to field work with drier than normal precipitation occurring in the ten prior days to field work (Appendix B-1). Surface water input from the slope and stormwater culverts with some groundwater serves as the source of hydrology for Wetland 1. The presence of hardpan soils likely holds water near the surface in some areas of the wetland. At the time of the field investigation, Surface water (A1), High water table (A2), and Saturation (A3) indicators were present (Appendix B). Water flows from the west into Wetland 1 through a driveway culvert and off-site to the east through a defined stream channel. The western portion of the stream appears to be seasonal as it was drying up at the time of our site visit. A large stormwater culvert under Westside Road brings in significant flow half-way through the wetland and the stream becomes perennial. The boundaries of Wetland 1 were flagged where indicators of wetland vegetation, hydric soil, and wetland hydrology were present. These corresponded to a topographic depression.

Wetland 1 is characterized as a depressional outflow wetland using the HGM system. Slope characteristics were also present. It is a Category I wetland according to the current Ecology (2014) rating system based on the special characteristic of aspen forest providing at least 20% total cover of woody species. Wetland 1 provides high levels of water quality, moderate hydrologic, and high habitat function. Wetland Rating system points were assigned as follows:

Water Quality Score: 8 (High level of function)
Hydrologic Score: 5 (Moderate level of function)
Habitat Score: 8 (Moderate level of function)
Total 21

Wetland functions and values for Wetland 1 are detailed in Appendix C.

Figure 5. Overview of Wetland 1 at the west end of the wetland.

Wetland 2
Wetland 2 is characterized as a palustrine open water and scrub-shrub (POW/PEM) wetland with some fringing palustrine scrub-shrub (PSS) areas (FGDC 2013). Much of the wetland surrounds a large excavated pond and is overall depressional. Wetland 2 was estimated to be three acres in size and extends off-site to the west.

Wetland 2 is dominated by an herbaceous layer of common cattail (*Typha latifolia*), small-fruited bulrush (*Scirpus microcarpus*), soft rush (*Juncus effusus*), reed canarygrass (*Phalaris arundinacea*), and eggbract sedge (*Carex leporina*) (Appendix B; Figure 6).
Hydric soils indicators for Loamy Mucky Mineral (F1) were present. The soil profile generally consists of a very dark brown (10YR 2/2) loamy mucky sand with gravel from 0-10 inches and a hardpan/gravel layer starting at 10 inches (Appendix B).

Normal precipitation conditions were present in the 3 months prior to field work with drier than normal precipitation occurring in the ten prior days to field work (Appendix B-1). Surface water input with groundwater from the pond serves as the source of hydrology for Wetland 2. At the time of the field investigation, Surface Water (A1), High water table (A2) and Saturation (A3) were observed (Appendix B). Water flows from the south into Wetland 2 from an unnamed stream into the pond. Water flows out of the wetland through a defined channel and through a culvert under the Iron Horse State Park trail to the north. The boundaries of Wetland 2 were flagged where indicators of wetland vegetation, hydric soil, and wetland hydrology were present.

These corresponded to a topographic depression.

Wetland 2 is characterized as a depressional outflow wetland using the HGM system. It is a Category II wetland according to the current Ecology (2014) rating system providing moderate levels of water quality, hydrologic, and habitat function. Wetland Rating system points were assigned as follows:

Water Quality Score: 7 (Moderate level of function)
Hydrologic Score: 6 (Moderate level of function)
Habitat Score: 7 (Moderate level of function)
Total 20

Wetland functions and values for Wetland 2 are detailed in Appendix C.

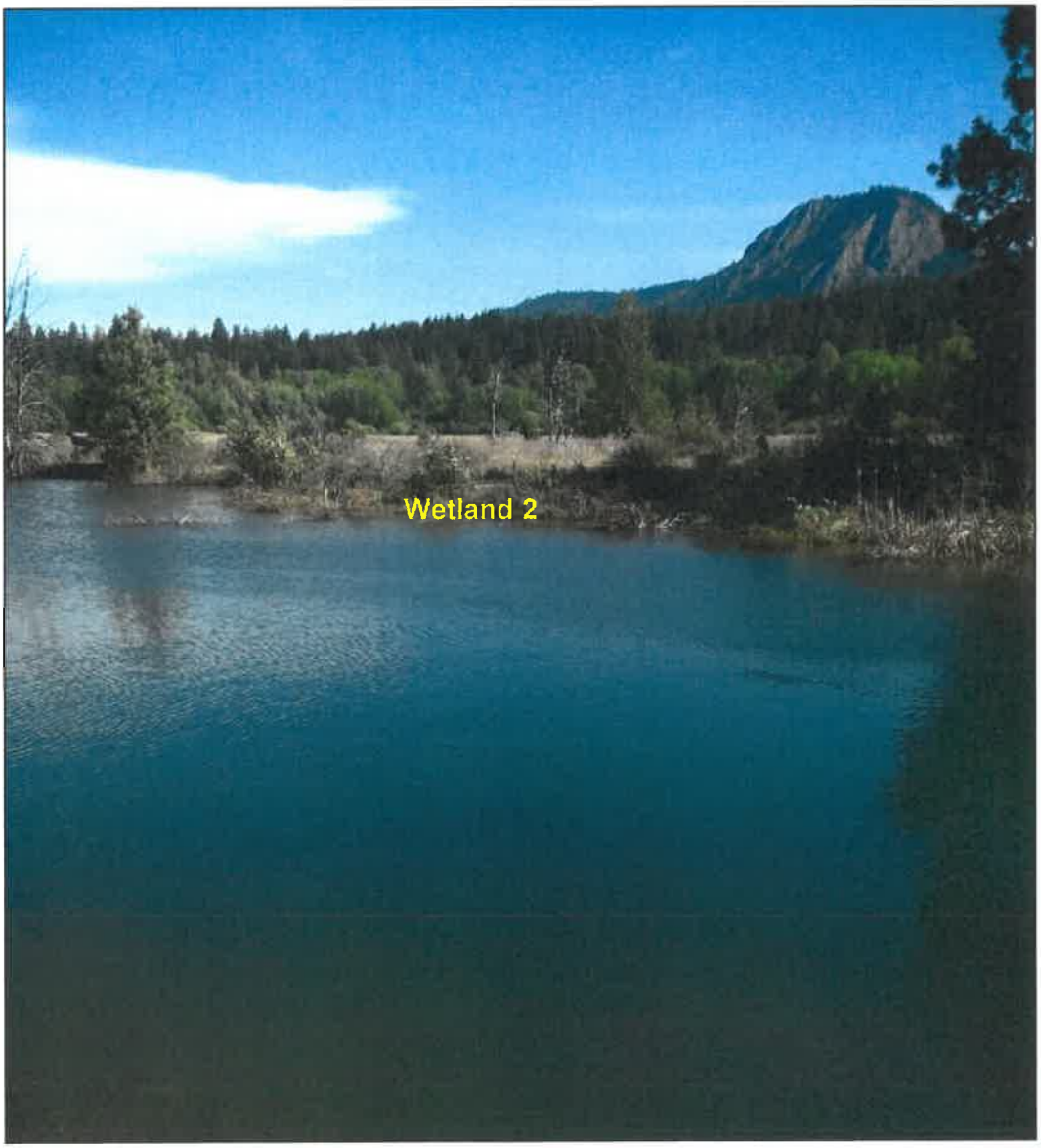

Figure 6. Overview of Wetland 2.

4.2.2 Upland

Uplands adjacent to the wetlands is dominated by ponderosa pine, quaking aspen, with an understory of lupine, antelope bitterbrush, common snowberry, serviceberry, and meadow foxtail. Soils are generally dark grayish brown (10YR 4/2) silt loam to very dark brown (10YR 2/2) sandy loam to a depth of 16-inches. Soils were dry (Appendix B).

4.3 Threatened and Endangered Species, Priority Habitats and Species

The United States Fish and Wildlife Service (2019) listing of species under its jurisdiction indicated the potential presence of threatened bull trout (*Salvelinus confluentus*) in Tillman Creek, marbled murrelet (*Brachyramphus marmoratus*), western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), North American wolverine (*Gulo gulo luscus*), gray wolf (*Canis lupis*), northern spotted owl (Strix *occidentalis*), Canada lynx (*Lynx canadensis*) in the project area. National Marine Fisheries Service listed Chinook Salmon (*Oncorhynchus tshawytscha*) and Steelhead Trout (*O. mykiss*) are also present in Tillman Creek (StreamNet 2019). Habitat for these listed species is not present on the project site; therefore, potential construction of solar panels is not expected to impact listed species or their habitat.

4.3.1 Wildlife and Priority Species and Habitat

Wetlands and Biodiversity Areas and Corridors are considered Washington State Priority Habitats and are present in the project area (WDFW 2008; WDFW 2019a). Much of the historic landscape has been altered by agriculture and residential use/development within the vicinity. Wildlife expected in the project area likely includes a variety of shrews, chipmunks, mice, voles, owls, raptors, falcons, and songbirds. All wetlands are likely to provide habitat for invertebrates: insects, spiders, and freshwater gastropod mollusks. Priority species that may be associated with aquatic habitats include western toad *(Anaxyrus boreas)* and blue heron (*Ardea herodias*). Evidence of mule deer (*Odocoileus hemionus*) and coyote (*Canis latrans*) were present. On-site observations of the following birds were made: red-breasted nuthatch (*Sitta canadensis*), American robins (*Turdus migratorius*), yellow rumped warblers (*Setophaga coronate*), song sparrow (*Melospiza melodia*), northern flicker (*Colaptes auratus*), black capped chickadees (*Poecile atricapillus*), dark eyed juncos (*Junco hyemalis*), American crows (*Corvus brachyrhynchos*), and red-winged blackbirds (*Agelaius phoeniceus*). Potential occurrence of the Sharp-tailed Snake (*Contia tenuis*) is mapped north of the Yakima River and could be on site (WDFW 2019a; Kittitas County 2014). The dace (*Rhinichthys* spp.) and trout (*Onchorhychus* spp.) were observed in the ponded area of Wetland 2.

Chapter 5. Proposed Project Impacts and Functional Assessment

5.1 Proposed Impacts

The proposed solar power production facility would be located outside of the proposed Critical Area buffers; however, since Wetland 1 spans the entirety of the road frontage along Westside Road to the South (Appendix D), the most feasible way to access the property is through Wetland 1. Westside Solar is currently evaluating the most-feasible, least-impactful location for the access road. The site plan identifies two proposed access options: Option A and Option B (Appendix D). The project identified options for off-site access through private potential private easements but was unable to make contact with the private landowners who would need to grant the project private easements.

Option A would be an access road through the narrowest point of Wetland 1 and thus minimize the area of horizontal impacts. However, Option A would likely require more grading and earthwork to achieve the maximum grade requirements allowed by the Kittitas County Code and International Fire Code. Alternatively, Option B would utilize an existing dirt road that the current landowner uses for access. The dirt road would have to be improved in order to meet the local access road requirements and provide all-weather access. Depending upon the access option selected, the access road would impact a total 0.02 acres with Option A, or a total of 0.22 with Option B. The access road options would also impact 0.05 acres and 0.12 acres of the proposed Wetland 1 buffer for Option A and Option B respectively.

5.2 Impact Assessment

In general, the proposed project area is dominated by pasture seed-mix grasses and herbaceous weeds, with soils that have been impacted by fill and compaction; providing low filtration (water quality and quantity), screening, and habitat functions. A culvert across the existing access road provides hydrologic connectivity between the eastern and western halves of Wetland 1.

Option A would impact a much smaller area than Option B, however this option would result in significantly more earthwork and grading in and around Wetland 1. Option A would also impact an area of the wetland that is fully functioning. Option B would impact Wetland 1 in an area that is currently a dirt access road used by trucks and farm equipment to access areas throughout the subject parcel. The Option B access road would occur in an area of existing impacts where wetland functions are low.

5.2.1 Assessment of Habitat Functions and Values

The proposed project would largely occur in an area dominated by pasture seed-mix grasses and herbaceous weeded species. In these previously impacted areas, habitat functions appear low; and planting trees and shrubs in wetland and buffer areas throughout the subject parcel would provide an overall functional lift in the project area. Wetland functions and values will be preserved/improved.

The habitat functions that would be provided by restoring or mitigating these previously impacted areas would include:

- Protect fish habitat and provide wildlife habitat;

- Maintain water quality;
- Provide adequate recruitment for large woody debris;
- Maintain adequate stream temperatures;
- Maintain in-stream conditions;
- Maintain areas for channel migration;
- Protect adjacent and downstream areas from erosion and other hazards;

5.2.2 Buffer Width Selection

The KCC provides wetland buffer width requirements in Section 17A.04.020, and describes buffer width ranges in Section 17A.04.025. According to this code, the County director shall establish the least restrictive buffer width based on four criteria.

The four criteria are listed below followed by an analysis of how it applies to the project:

1. *The overall intensity of the proposed use;*

   ANALYSIS : The proposed project has a low-profile, low-impact design. The project utilizes minimal grading and impervious surfaces. Once constructed, there will be no emissions or light and vehicular and foot traffic will be minimal and periodic. The inverters will generate low noise during daylight hours, but this will not result in increased noise level within the Critical Areas.

2. *The presence of threatened, endangered, or sensitive species;*

   ANALYSIS: To our knowledge, threatened, endangered, or sensitive species have not been identified within the project area. During the wetland delineation, no threatened, endangered, or sensitive species were identified. The habitat trip performed for the SEPA Checklist did not identify any threatened, endangered, or sensitive species within the project area.

3. *The site's susceptibility to severe erosion;*

   ANALYSIS: To our knowledge the site is not susceptible to severe erosion. There is no evidence of unstable soils in the vicinity of the proposed project area. The majority of the project areas is relatively flat.

4. *The use of a buffer enhancement plan by the applicant which uses native vegetation or other measures which will enhance the functions and values of the wetland or buffer.*

   ANALYSIS: The following Chapter 6 of this report outlines the project's detailed mitigation plan that exceeds Ecology's mitigation requirements and ratios.

Based on above analysis, we have selected the Kittitas County buffer widths of 50 feet and 25 feet for Wetland 1 and Wetland 2, respectively. The selected buffers align with the minimum buffer-width standards in the KCC. However, the project proposes to compensate for the acreage of "buffer loss" that would occur based on Department of Ecology's Best Available Science (BAS) for Eastern Washington (Ecology 2018) minimum buffer widths. The project would also provide buffer and wetland enhancement elements consistent with Ecology's mitigation recommendations (see Chapter 6 below).

5.2.3 Mitigation Sequence

The proposed project adheres to mitigation sequencing requirements as demonstrated below.

A. **Avoiding:** The project would avoid the proposed 25 and 50-foot wetland buffers where possible. Because Wetland 1 spans the entirety of the road frontage, the only way to access the project is through Wetland 1 and the associated buffers.

B. **Minimizing:** The proposed project would have the least-impactful design in order to minimize the impact area. The solar array would also be placed in a grass area with relatively low habitat value. Moreover, an appropriate stormwater plan would be used such that the stormwater inputs into critical areas are non-existent or minimal. Since Wetland 1 spans the entirety of the road frontage along Westside Road to the South (Appendix D), the most feasible way to access the property is through Wetland 1. Westside Solar is currently evaluating the most-feasible, least-impactful location for the access road. The site plan identifies two proposed access options: Option A and Option B (Appendix D). Attempts were made to secure access through adjacent private property, instead of across Wetland 1, but were unsuccessful.

C. **Rectifying:** All temporarily impacted areas that do not contain permanent structures would be reseeded and access to these areas would be restricted to allow for the regrowth of native vegetation where appropriate.

D. **Reducing:** Foot traffic and other human activity would be restricted in and around Critical Areas, so as not to disturb wildlife use. Placement of conservation signage would reduce the potential impacts to the wetland and buffer in the future. A vegetated 25-foot-wide wildlife corridor would also be established (Figure X), allowing wildlife to traverse the project area at its edges.

E. **Compensating:** Because the proposed access driveway would impact wetlands and buffers, a mitigation plan is provided below (Chapter 6). The Mitigation Plan addresses impacts to Critical Areas and buffers to ensure that a "no net loss" scenario is achieved. "No net loss" means the maintenance of the sum of critical area functions and values as achieved through a case-by-case review of development proposals by the County planning department.

Chapter 6. Conceptual Mitigation Plan

6.1 Mitigation Overview

To mitigate for the proposed impacts to Wetland 1 and its buffer from the improved project access driveway, on-site mitigation is proposed at various mitigation ratios. Project impacts (for Option A and Option B) and mitigation areas are shown in the attached Wetland Impacts figure (Appendix A). Table 3 summarizes the proposed on-site mitigation measures for development impacts to the wetland and buffers.

Table 3. Proposed Mitigation Measures for Critical Area Impacts.

Feature	Mitigation Type	Recommended Mitigation Ratio[1]	Impacted Area being Compensated for (acres)	Proposed Mitigation Area (acres)	Excess Mitigation Based on Recommended Ratio (acres)
Wetland 1	Wetland Re-establishment	4:1	0.02[2] or 0.22[2]	1.05	0.97 or 0.17
	Wetland Enhancement	1:1	2.83[3] or 2.75[3]	2.17	n/a
	Buffer Enhancement /Creation	1:1	2.83[3] or 2.75[3]	2.69	n/a
Wetland 2	Wetland Enhancement	1:1	1.94[3]	0.57	0.57[4]
	Buffer Enhancement /Creation	1:1	1.94[3]	1.71	n/a
Wildlife Corridor	Buffer Creation/ Habitat connectivity	n/a	n/a	n/a	0.63
Totals[5]			**4.79 or 4.91**	**8.19**	**2.17 or 1.37**

[1]Based on Ecology guidance Table 8C-11 (Ecology 2014) for wetland impacts and 1:1 buffer enhancement ratio.
[2]Direct impacts to Wetland 1 from the proposed access road for Option A and Option B, respectively.
[3]Calculated from the total area of BAS minimum "buffer loss" subtracted from the proposed buffers. BAS minimum buffers are 100 feet for Category I and 75 feet for Category II; proposed buffers are 50 feet for Category 1 and 25 feet for Category II. The proposed access road for Option A and Option B are each presented respectively.
[4]We proposed additional (excess) direct wetland enhancement to help account for "buffer loss" difference between BAS buffers and proposed buffers.
[5]Note: totals are not necessarily additive.

6.2 Mitigation Measures

The below recommendations were developed to enhance Wetland 1, Wetland 2, and buffer habitat within the project area. General and specific mitigation measures for the mitigation area are outlined below. Common invasive species, such as Himalayan blackberry (*Rubus armeniacus*) and reed canarygrass (*Phalaris arundinacea*), should be removed and strictly controlled and native wetland and buffer areas should be re-established or enhanced. Much of the pasture area within the subject parcel is generally lacking species diversity and the wetland buffer function and habitat quality would be improved by installing a more diverse set of shrubs and trees.

6.2.1 Mitigation Measures Summary

The below suggestions were developed to provide enhanced wetland and buffer habitat within the study area. General and specific mitigation measures for the mitigation area are outlined below. In addition to the proposed planting area, invasive species removal would be conducted along the slope that forms the eastern boundary of Wetland 1, and anywhere else it is encountered. Wetland buffer function and habitat quality would be improved by removing these invasive species and allowing native vegetation to grow in the area. Moreover, wetland-tolerant willow (Salix sp.) stakes would be planted at a 45 degree angle along the western edge of the mitigation area to create overhanging vegetation.

We recommend the following mitigation measures in order to meet the requirements of no net loss:

1. Remove Invasive species Himalayan blackberry and reed canarygrass from the mitigation area.
2. Add a 3-inch layer of mulch (wood chips) in the mitigation area where soils have been disturbed, where there is existing pasture, and in areas where blackberry and reed canarygrass has been removed.
3. Compensate for wetland and buffer impacts by enhancing the mitigation area.
    a. Plant native trees, shrubs, and ground cover within the 8.19-acre mitigation area and 0.63-acre wildlife corridor. This would include installing angled willow stakes around the edges of the ponded areas within the mitigation area (Appendix A). Willow stakes would have a minimum stem length of 3.3 feet to qualify as a Special Habitat Feature per the Wetland Rating System for Western WA (Hruby 2016).
    b. Plant quaking aspen in pasture areas to extend the aspen forest in Wetland 1.
    c. Excavate the upland "island" area east of the proposed access road to re-establish wetland conditions. Tree and shrub removal should be avoided where possible, and woody material should be left in place if removal is required for excavation.
4. Install protective planting covers ("blue tubes") around all woody-stemmed plants planted as part of this mitigation plan.
5. Implement a conservation sign along the edge of the mitigation area. Install one sign at the northeast corner of the study area.
6. Add of language to the property deed stating that the mitigated critical area buffer would be set aside as a permanent conservation area, regardless of ownership.

7. Requirements that maintenance and monitoring would be performed for a minimum of 5 years.
8. The construction contractor would be responsible for Best Management Practices that comply with federal, state, and county codes (see Section 6.3.1 for BMPs).

6.2.2 Reccomended Plant Species

Mitigation would include enhancement and wetland re-establishment of the 8.19-acre mitigation area and 0.63-acre wildlife corridor by planting trees, shrubs, and emergent species throughout the subject parcel. Table 4 provides recommended species and quantities to adequately vegetate the mitigation area. Specific plant species may be substituted for like species based on nursery availability.

Table 4. Recommended Species List.

Common Name	Scientific Name	Area	Planting Method	Recommended Spacing (ft. O.C.)	Recommended Quantity
Trees					
Quaking Aspen	*Populus tremuloides*	Wetland 1	1-gal	18	200
Red alder	*Alnus rubra*	Wetlands 1 and 2	1-gal	18	150
Pacific Willow	*Salix lucida*	Wetlands 1 and 2	Like stake	18	250
Douglas fir	*Pseudotsuga menziesii*	Buffer and Wildlife Corridor	1-gal	18	300
Pondarosa Pine	*Pinus ponderosa*	Buffer and Wildlife Corridor	1-gal	18	300
Shrubs					
Nootka rose	*Rosa nutkana*	Wetlands 1 and 2	1-gal	8	400
Cayote willow	*Salix exigua*	Wetlands 1 and 2	Live stake	8	500
Hooker's willow	*Salix hookeriana*	Wetlands 1 and 2	Live stake	8	500
Red osier dogwood	*Cornus alba*	Wetlands 1 and 2	1-gal	8	400
Serviceberry	*Amelanchier alnifolia*	Buffer and Wildlife Corridor	1-gal	8	800
Antelope bitterbrush	*Purshia tridentate*	Buffer and Wildlife Corridor	1-gal	8	800
Oregon grape	*Mahonia aquifolium*	Buffer and Wildlife Corridor	1-gal	8	800
Groundcover/herbs					
Sedge and rush seed mix	various	Wetlands 1 and 2	Hydro-seed	-	26 lbs
Total					**5,400**

Notes: ft O.C. = feet on center, 1-gal = 1-gallon container

6.3 Mitigation Installation

6.3.1 Site Preparation

Invasive Species Removal
Several areas have been identified as containing invasive Himalayan blackberry and reed canarygrass. Weed control measures would be conducted prior to plant installation. To the extent practical, all non-native vegetation including Himalayan blackberry, reed canarygrass, any other identified invasive species, would be removed from the mitigation site prior to planting, and thereafter strictly controlled. Plant cover for a particular invasive species may not exceed 10% throughout the monitoring period. All invasive weeds would then be completely removed from the property or burned on site to prevent re-growth.

Native trees and shrubs that exist within the Mitigation Area would be left in place where feasible as they may provide cover for the maturing installed plantings.

Mulching
Mulch would be applied where soils have been disturbed, where there is existing pasture, and in areas where invasive species have been removed in the Mitigation Area to shade out weedy and invasive species and aid in planting success. Wood chips may be applied to the Buffer Mitigation Area at a minimum of 3-inches deep. Additional wood chips may need to be purchased as necessary.

Mitigation Site Best Management Practices
The following best management practices (BMPs) are recommended prior to and during mitigation installation:

1. Appropriate erosion control measures, including but not limited to coir logs, filter fabric, silt fences, and straw bales, should be utilized during construction to reduce turbidity, sediment, and/or pollutants from entering critical areas.
2. The job site should be marked, the work area should be flagged, and equipment should be operated in a way that minimizes disturbance to riparian habitat.
3. All wastewater should be directed away from waterbodies and conform to Ecology Stormwater Standards.
4. All areas previously disturbed (clearing and/or fill) should be replanted with grass, or as authorized by the County planning department via the mitigation permit process.

6.3.2 Planting Plan
Plant installation should consist of installing plant protective devices and applying mulch if deemed necessary. Plant installation should not be initiated until the mitigation site is prepared in accordance with this mitigation plan and the requirements made by the County or other jurisdictional authority.

6.3.3 Source of Plant Materials
All plant materials used at the mitigation site should be acquired from local or near local sources, grown in Kittitas County, and obtained from a reputable native plant nursery, to the extent practical. For a list of plant species recommended for the site, see Table 4 above. Note that the quantities of individual species may change depending on nursery availability; however, the total number of plants per stratum should not change.

6.3.4 Planting Locations

Using Table 4 above, plants should be installed in areas best suited to promote growth and function of a native habitat area. Plants should be laid out in clusters or "islands" that mimic natural plant distribution. Specific attention should be paid to hydrologic, soil, and shade conditions that can contribute to the survival and proliferation of the plantings. Planting plan locations may vary based on actual site conditions, however the total number of plants installed and the area enhanced should not fall below the quantities suggested in Table 4.

6.3.5 Installation of Container and Bare Root Plants

Bare root plants should only be installed during the months of December and January. Planting outside of this window can substantially reduce survival rates. We recommend these general guidelines:

- Water all container stock and bare root plants the day before planting.
- Transplant according to the location recommendations provided in this report.
- Follow the appropriate spacing guidelines in Table 4.
- Dig holes deep enough and wide enough to allow room for roots to spread.
- Soil augmentation may be necessary to property establish the installed plants in the heavy clay rich soils.
- Install plantings with downward facing root mass and avoid "J-planting" or horizontal root arrangements.
- Apply water to the hole prior to installing the plant.
- Water plant after installation and tamp down the soil to close any air holes.
- Create soil basin around plantings to allow for water collection.

6.3.6 Markers

Numbered flags and/or posts to mark photo points should be established and photos should be taken during the initial phase of mitigation. These photo points should remain constant over the 5-year monitoring period and serve as a point of comparison show annual progress. The photo points should be indicated on map figures when submitted with the annual monitoring report. The number of photo points and their locations should be determined based on-site conditions and should be representative of the mitigation area.

6.3.7 Tentative Plant Installation Schedule

Native vegetation planting should begin in the spring or fall following approval of this mitigation plan by the County Planning Division. Plant installation should take place between February 15th and April 15th, between September 15th and October 31st, or according to the specific recommendations of a representative of the nursery that provides the plant materials.

6.4 Annual Monitoring and Maintenance

6.4.1 Performance Standards

Mitigation performance standards are used to determine the relative success of the mitigation project. Failure to meet these general minimum standards throughout the monitoring period would result in the implementation of contingency measures and maintenance activities provided in Section 6.5.3. We recommend the following performance standards for your mitigation site:

1. If invasive species become introduced to the area, they should be removed and

maintained so that invasive species areal cover is below 5% for the duration of the monitoring period.

2. Planted tree and shrub species should have a survival rate of at least 80% for the duration of the monitoring period.
3. If native colonizers result in the total native tree and shrub cover exceeding 80%, the mitigation would be considered successful and the suggested survival rate for installed plants would be decreased to 50%. A percent cover calculation should be conducted prior to plant installation to create a baseline for determining total plant cover success.
4. The ground layer should have an average areal cover of 50% throughout the mitigation area by the completion of the monitoring period.

6.4.2 Monitoring Schedule

The mitigation area should be maintained and monitored each year following installation. Monitoring reports should be submitted to the Planning Division annually beginning the year after the County accepts the mitigation plan specifications. The monitoring reports should be submitted by October 1 of each monitoring year. The general timeline and activities that should be conducted during the monitoring period will be specified in the finalized mitigation plan.

6.4.3 Monitoring Reports

At the end of each monitoring year an annual report should be prepared and submitted to the County Planning Division. The specific monitoring schedule would be determined by the date of implementation, the submittal of this mitigation plan by a Planning representative. The Year 1 monitoring report should be submitted by October 1 of the first monitoring year, contingent on administrative approval. Annual monitoring reports should provide an assessment of the mitigation site as it relates to the performance standards and an evaluation of progress toward completion of the goals and objectives contained in this mitigation plan. Each monitoring report should contain, at a minimum:

1. The survival rate and/or replacement of planted tree and shrub species.
2. Areal cover of planted herbaceous species.
3. Percent cover of native vegetation, native plant recruitment, average shrub height.
4. An inventory of plant species (both planted and volunteer).
5. A list of names, titles, and companies of any and all persons who participated in the data collection, compilation, and preparation of the monitoring report.
6. A mitigation site map identifying mitigation areas, data collection locations and/or transects, photo point locations, and any other pertinent information.
7. Labeled photographs from each of the photo point locations.
8. Copies of completed field data sheets.
9. An analysis of all qualitative and quantitative monitoring data.

6.4.4 Monitoring Methods

This section provides recommended methods for evaluating the success of the mitigation area.

Plant Survival Sampling Technique
An inventory of all installed plants should be conducted at the end of each growing season of the corresponding monitoring year. The total number of dead, missing, or declining plant stock should be recorded and subtracted from the total number of installed plants. The percentage of installed plants that have survived should be calculated to determine whether the performance standards are being met. If performance standards are not met for any monitoring year, the Applicant would be responsible for additional plantings to meet performance standard values, unless total percent cover (installed plants plus native recruits) meets or exceeds these criteria.

It is recommended that the entire mitigation area, be evaluated annually for the first two years. This would include documenting all planted individuals during mitigation installation, and subsequent annual counting of all individual plants within the planting area. It may be difficult to count individual ground cover species in later monitoring years. Ground cover should be evaluated based on areal cover. Monitoring plots should be evaluated to determine mitigation success.

Monitoring Inspection Checklist
The site should be inspected at least once a year to evaluate the mitigation progress (mid-summer). However, we would also encourage a visit during the late spring to do an additional evaluation for progress and potential maintenance. We recommend the following inspection guidelines to document the re-vegetation progress.

Spring (April-May):

1. Evaluate plants and plant communities using monitoring methods listed above.
2. If plants are determined to be dead, dying, or missing, replace with the same species or another species that is demonstrating success in the mitigation area.
3. Replace flags and markers as needed.
4. Photograph site from predetermined photo points.
5. Water plants as needed during dry springs and summers.

Fall (September-October):

1. Evaluate plants and plant communities using monitoring methods listed above.
2. If plants are determined to be dead, dying, or missing, replace with the same species or another species that is demonstrating success in the mitigation area.
3. Replace flags and markers as needed.
4. Photograph site from predetermined photo points.

6.4.5 Maintenance
Maintenance activities should be conducted throughout the entire mitigation area regularly throughout the monitoring period to ensure the success of the mitigation. Maintenance personnel, if contracted, should be informed of the ultimate goals and objectives of the approved mitigation plan. Persons conducting maintenance activities should also report existing or potential problems observed on-site.

Maintenance should be conducted using the following guidelines as the minimum amount of maintenance necessary to ensure mitigation success. Additional maintenance may be necessary. A summary of the maintenance tasks is provided in Table 5.

Table 5. Maintenance Task Schedule.

Activity	Schedule	Responsibility
Replace all dead and declining landscape plantings	One year following completion of the mitigation implementation, and then as specified in the annual Mitigation Monitoring Reports	The Applicant should be responsible for replacing all dead or unhealthy plants; the Applicant may choose to hire a Landscape contractor to do this work
Noxious species control measures	No less than twice per year during the growing season	The Applicant should be responsible for conducting noxious species control measures; the Applicant may choose to hire a Landscape contractor to do this work
Recommended Watering during Dry Season	July to September	The Applicant should be responsible for conducting watering measures during the dry season of the first two years.
Water installed plants (should only be necessary for the first two years following installation)	As needed, with a minimum of one inch of water for every two weeks during the dry season (generally July and August)	The Applicant should be responsible for implementing an appropriate watering schedule; the Applicant may choose to hire a Landscape contractor to do this work

6.5 Mitigation Completion

6.5.1 Notification of Completion

At the end of the monitoring period, the Applicant should provide written notification to the County Planning representative, provided the approved performance standards have been met. If mitigation has not achieved the performance standards, then the representative should be consulted for approval of a contingency plan. Only portions of the site that fail to meet specific performance standards should require additional monitoring. This process should continue until all performance standards are met or until the representative determines that mitigation is sufficiently successful.

The Applicant should not be held responsible or accountable for any natural occurrence that significantly damages or destroys the mitigation area provided that the plantings were documented to have been proceeding towards meeting the performance standards prior to the naturally damaging disturbance. Natural occurrences that could cause significant damage include, but are not limited to, significant windstorm events, flooding, naturally caused fire, or other destructive natural forces. In the event that the site is damaged or destroyed by a natural occurrence, reconstruction and replanting should not be required; however, if the mitigation area fares significantly worse than the surrounding natural communities, the mitigation site would be considered not to have sufficiently established itself, and reconstruction, replanting, and monitoring should continue.

6.5.2 Agency Confirmation

Following submittal of the final monitoring report and notification of completion of the monitoring period, County planning staff should provide written confirmation releasing the Applicant of any and all mitigation and monitoring responsibilities associated with this plan. While it is the

responsibility of the Applicant to ensure that the mitigation is successful, agency staff should review annual reports in a timely fashion and provide comments throughout the monitoring period so that any part of the mitigation project that is deemed insufficient can be addressed prior to the anticipated end of the monitoring period.

6.5.3 Contingency Plan and Measures

Contingency measures should be implemented if one or more of the performance standards are not met for any monitoring year. If contingency measures are required, a qualified wetland scientist should prepare an analysis of the cause(s) of failure and, if deemed necessary by County Planning staff, develop a plan for remedial action. Maintenance and monitoring would continue beyond the original monitoring period until the agencies give final approval releasing the Applicant of remaining mitigation responsibilities.

If it is determined that the performance standards cannot be achieved through routine maintenance, a qualified wetland scientist should develop a contingency plan. The contingency plan would replace the corresponding components of the approved mitigation plan and must be approved by County Planning staff prior to implementation.

Contingency Measures

If performance standards are not met within the maintenance and monitoring period, the following actions are recommended:

1. If survival of installed plants become less than 80% during the monitoring period for any particular species, then additional planting should occur to restore the number and species to plan specifications, unless it is determined that a different native species would have greater success.
2. If noxious species occupy more than 10% of the total areal cover, then additional weed control measures should be utilized.
3. If the average overall native herbaceous cover is below 50% then additional planting should occur to ensure adequate coverage.
4. If additional mitigation measures are needed to meet the performance standards in this report, a Hamer scientist or other qualified professional would monitor efforts to reestablish the mitigation area. A specific contingency plan may be required if any or all performance standards are not met by the end of the monitoring period.

LIMITATIONS

This report is based upon information collected in the field and obtained from resources provided by Federal, State, and Local agencies. Conclusions are the professional opinion of the author are subject to approval by the appropriate agencies.

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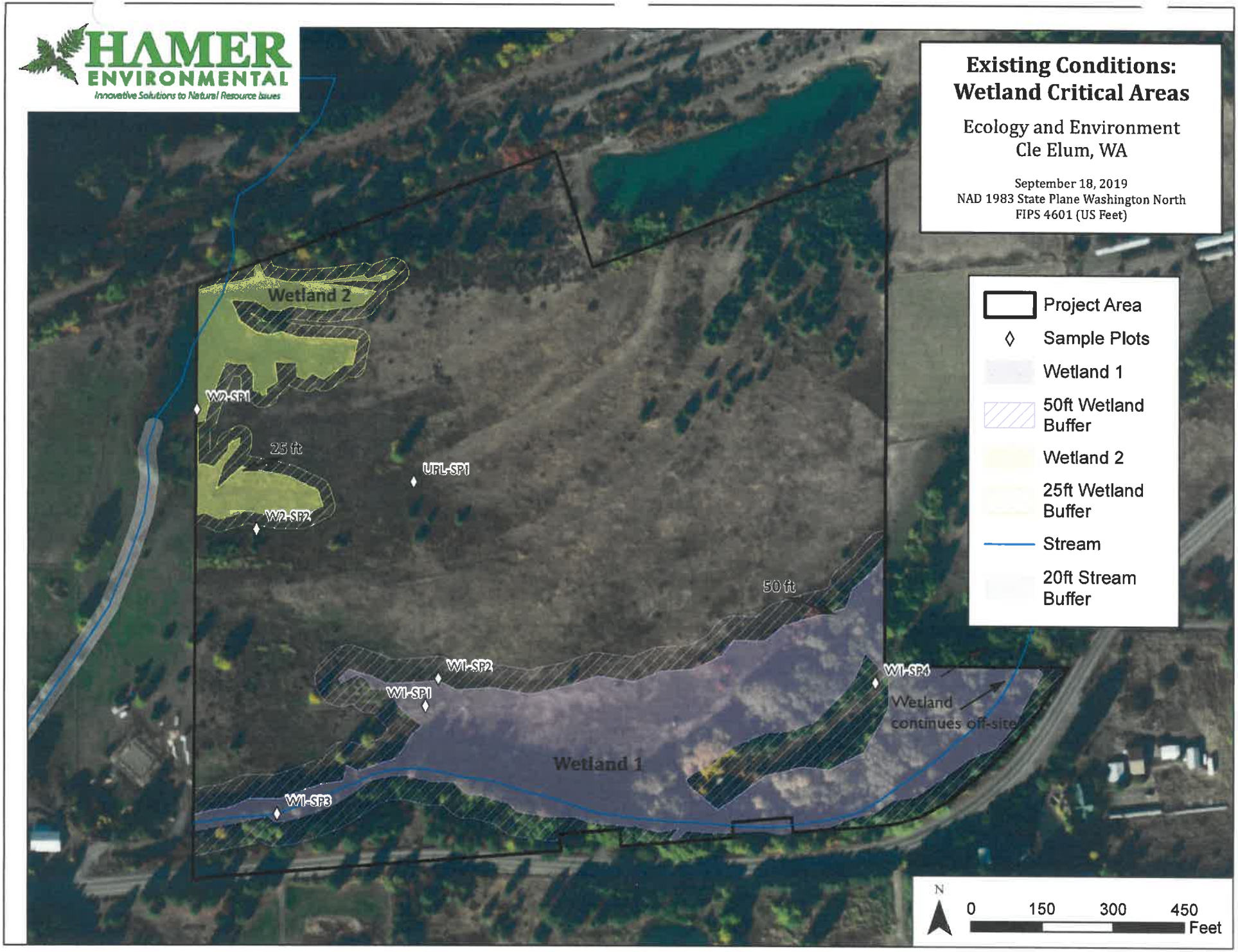
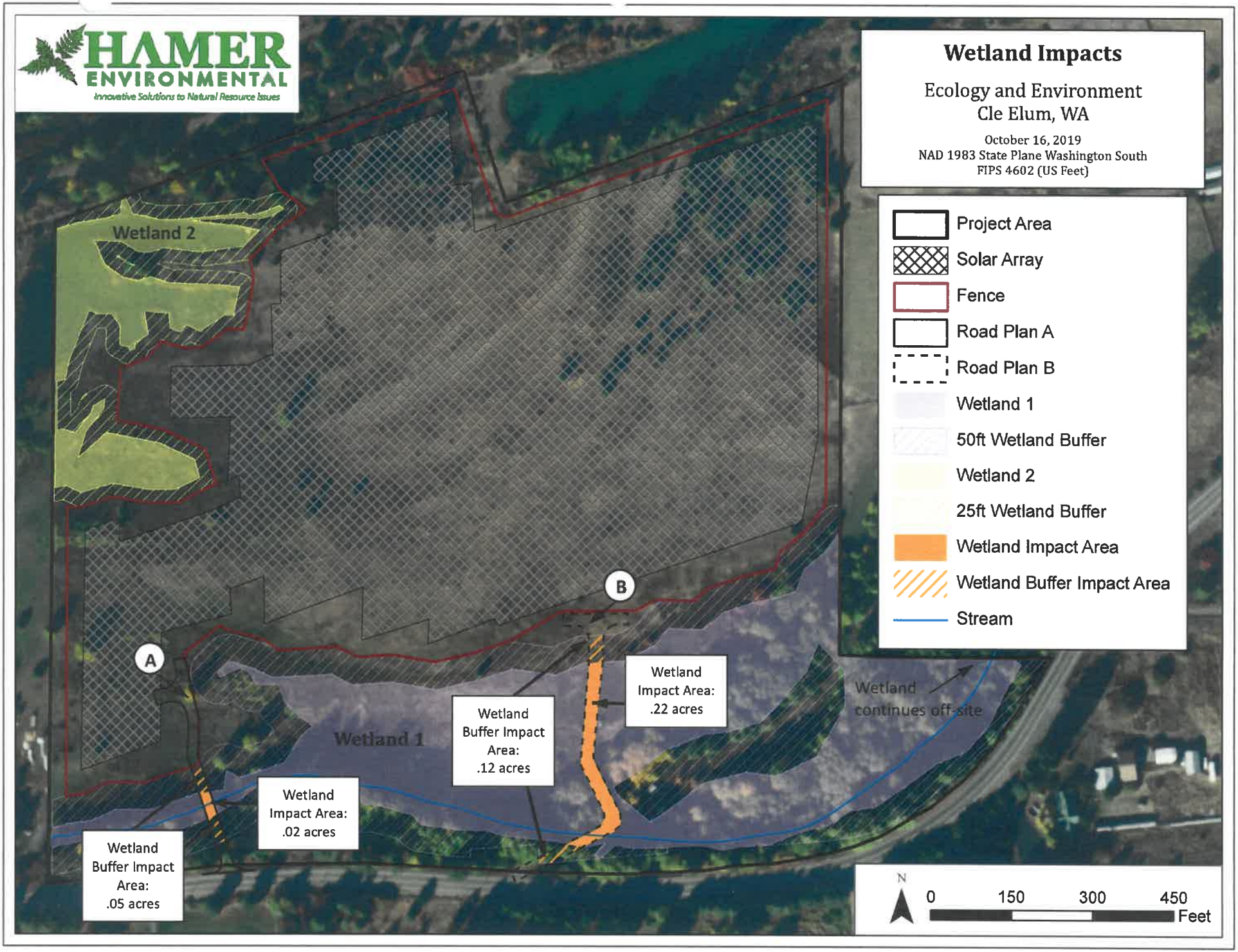
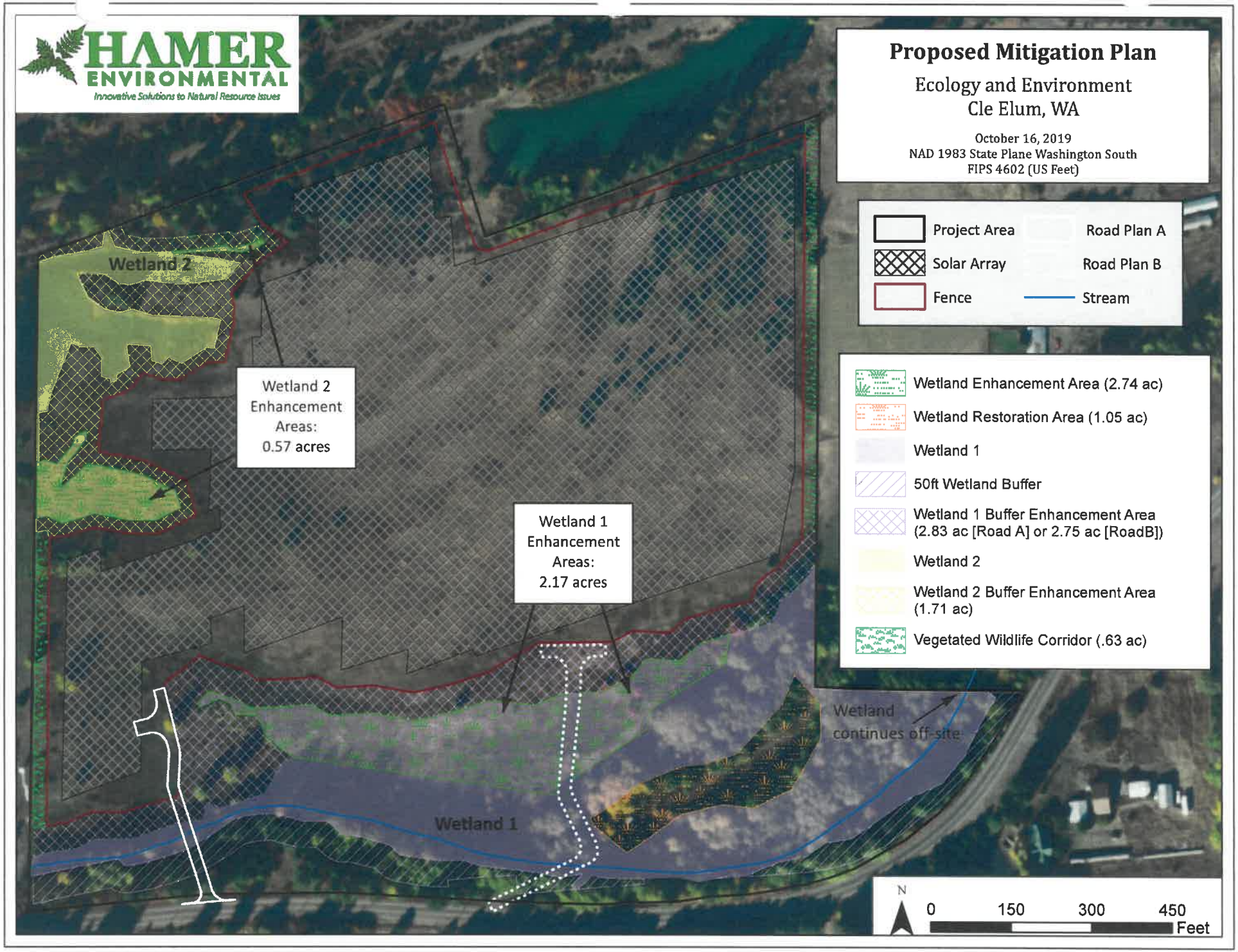
Appendix A — Supplementary Figures


HAMER ENVIRONMENTAL
Innovative Solutions to Natural Resource Issues
Existing Conditions:
Wetland Critical Areas
Ecology and Environment
Cle Elum, WA
September 18, 2019
NAD 1983 State Plane Washington North
FIPS 4601 (US Feet)
Project Area
Sample Plots
Wetland 1
50ft Wetland Buffer
Wetland 2
25ft Wetland Buffer
Stream
20ft Stream Buffer
Wetland 2
W2-SP1
25 ft
UPL-SP1
W2-SP2
50 ft
W1-SP2
W1-SP1
W1-SP4
Wetland continues off-site
Wetland 1
W1-SP3
N
0
150
300
450
Feet


HAMER ENVIRONMENTAL
Innovative Solutions to Natural Resource Issues
Wetland Impacts
Ecology and Environment
Cle Elum, WA
October 16, 2019
NAD 1983 State Plane Washington South
FIPS 4602 (US Feet)
Project Area
Solar Array
Fence
Road Plan A
Road Plan B
Wetland 1
50ft Wetland Buffer
Wetland 2
25ft Wetland Buffer
Wetland Impact Area
Wetland Buffer Impact Area
Stream
Wetland 2
Wetland 1
A
B
Wetland Impact Area: .22 acres
Wetland Buffer Impact Area: .12 acres
Wetland Impact Area: .02 acres
Wetland Buffer Impact Area: .05 acres
Wetland continues off-site
N
0
150
300
450
Feet


HAMER ENVIRONMENTAL
Innovative Solutions to Natural Resource Issues
Proposed Mitigation Plan
Ecology and Environment
Cle Elum, WA
October 16, 2019
NAD 1983 State Plane Washington South
FIPS 4602 (US Feet)
Project Area
Solar Array
Fence
Road Plan A
Road Plan B
Stream
Wetland Enhancement Area (2.74 ac)
Wetland Restoration Area (1.05 ac)
Wetland 1
50ft Wetland Buffer
Wetland 1 Buffer Enhancement Area (2.83 ac [Road A] or 2.75 ac [RoadB])
Wetland 2
Wetland 2 Buffer Enhancement Area (1.71 ac)
Vegetated Wildlife Corridor (.63 ac)
Wetland 2
Wetland 2 Enhancement Areas: 0.57 acres
Wetland 1 Enhancement Areas: 2.17 acres
Wetland continues off-site
Wetland 1
N
0
150
300
450
Feet

Appendix B — Data Sheets and Precipitation Data

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: South Cle Elum-Westside Road | City/County: Kittitas County | Sampling Date: 5/13/2019
Applicant/Owner: Heelstone Energy | State: WA | Sampling Point: W1-SP1
Investigator(s): Kristin Murray | Section, Township, Range: S33, T20N, R15E
Landform (hillslope, terrace, etc.): terrace | Local relief (concave, convex, none): concave | Slope (%): 0-1
Subregion (LRR): A | Lat: 47.1766 | Long: -120.969032 | Datum: NAD83
Soil Map Unit Name: Patnish-Mippon-Myzel complex | NWI Classification: PEM
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 ( ) No
Hydric Soil Present? (●) Yes ( ) No
Wetland Hydrology Present? (●) Yes ( ) No

Is the Sampled Area within a Wetland? (●) Yes ( ) No

Remarks:
Large depressional forested and emergent wetland is located on the southern portion of the study site. Sample plot 1 taken in emergent wetland area.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dom. Sp.?	Relative % Cover	Indicator Status
1.				
2.				
3.				
4.				
	= Total Cover			
Sapling/Shrub Stratum (Plot size:)				
1.				
2.				
3.				
4.				
5.				
	= Total Cover			
Herb Stratum (Plot size: 10ft x 10ft)				
1. *Phalaris arundinacea*	30	Y	30.0	FACW
2. *Alopecurus pratensis*	30	Y	30.0	FAC
3. *Equisetum arvense*	5	N	5.0	FAC
4. *Juncus balticus*	35	Y	35.0	FACW
5.				
6.				
7.				
8.				
9.				
10.				
11.				
	100 = Total Cover			
Woody Vine Stratum (Plot size:)				
1.				
2.				
	= Total Cover			

% Bare Ground in Herb Stratum

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 3 (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	65	x 2 =	130
FAC species	35	x 3 =	105
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		235 (B)

Prevalence Index = B/A = 2.350

Hydrophytic Vegetation Indicators:
[ ] 1 - Rapid Test for Hydrophytic Vegetation
[✓] 2 - Dominance Test is >50%
[✓] 3 - Prevalence Index is ≤3.0[1]
[ ] 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
[ ] 5 - Wetland Non-Vascular Plants[1]
[ ] 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

Remarks:
More than 50% of the dominant species are rated FAC or FACW; therefore, the hydrophytic vegetation criteria is met.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: South Cle Elum-Westside Road | City/County: Kittitas County | Sampling Date: 5/13/2019
Applicant/Owner: Heelstone Energy | State: WA | Sampling Point: W1-SP1
Investigator(s): Kristin Murray | Section, Township, Range: S33, T20N, R15E
Landform (hillslope, terrace, etc.): terrace | Local relief (concave, convex, none): concave | Slope (%): 0-1
Subregion (LRR): A | Lat: 47.1766 | Long: -120.969032 | Datum: NAD83
Soil Map Unit Name: Patnish-Mippon-Myzel complex | NWI Classification: PEM
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	( ) No	**Is the Sampled Area within a Wetland?** (●) Yes ( ) No
Hydric Soil Present?	(●) Yes	( ) No	
Wetland Hydrology Present?	(●) Yes	( ) No	

Remarks:
Large depressional forested and emergent wetland is located on the southern portion of the study site. Sample plot 1 taken in emergent wetland area.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dom. Sp.?	Relative % Cover	Indicator Status
1.				
2.				
3.				
4.				
	= Total Cover			
Sapling/Shrub Stratum (Plot size:)				
1.				
2.				
3.				
4.				
5.				
	= Total Cover			
Herb Stratum (Plot size: 10ft x 10ft)				
1. *Phalaris arundinacea*	30	Y	30.0	FACW
2. *Alopecurus pratensis*	30	Y	30.0	FAC
3. *Equisetum arvense*	5	N	5.0	FAC
4. *Juncus balticus*	35	Y	35.0	FACW
5.				
6.				
7.				
8.				
9.				
10.				
11.				
	100 = Total Cover			
Woody Vine Stratum (Plot size:)				
1.				
2.				
	= Total Cover			

% Bare Ground in Herb Stratum

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 3 (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	65	x 2 =	130
FAC species	35	x 3 =	105
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		235 (B)

Prevalence Index = B/A = 2.350

Hydrophytic Vegetation Indicators:

- [ ] 1 - Rapid Test for Hydrophytic Vegetation
- [x] 2 - Dominance Test is >50%
- [x] 3 - Prevalence Index is ≤3.0[1]
- [ ] 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] 5 - Wetland Non-Vascular Plants[1]
- [ ] 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

Remarks:
More than 50% of the dominant species are rated FAC or FACW; therefore, the hydrophytic vegetation criteria is met.

SOIL

Sampling Point: W1-SP1

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR	3/1	80	7.5YR	4/6	20	C	PL	Silty Clay Loam	concentration is prominent
10-16	10YR	5/2	60	10YR	4/1	25	D	M	Silty Clay Loam	concentration is distinct
10-16				7.5YR	4/6	15	C	M	Silty Clay Loam	concentration is prominent

[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: (Applicble to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☑ 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) (except MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? ◉ Yes ○ No

Remarks:
Soils meet A11, F3, and F6 indicators.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? ○ Yes ◉ No Depth (inches):

Water Table Present? ◉ Yes ○ No Depth (inches): 12

Saturation Present? (includes capillary fringe) ◉ Yes ○ No Depth (inches): 0

Wetland Hydrology Present? ◉ Yes ○ No

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

Remarks:
Primary indicators A2 and A3 were met.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: South Cle Elum-Westside Road | City/County: Kittitas County | Sampling Date: 5/13/2019

Applicant/Owner: Heelstone Energy | State: WA | Sampling Point: W1-SP2

Investigator(s): Kristin Murray | Section, Township, Range: S33, T20N, R15E

Landform (hillslope, terrace, etc.): terrace | Local relief (concave, convex, none): convex | Slope (%): 1-2

Subregion (LRR): A | Lat: 47.176758 | Long: -120.968923 | Datum: NAD83

Soil Map Unit Name: Patnish-Mippon-Myzel complex | 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	(●) No	**Is the Sampled Area within a Wetland?** ( ) Yes (●) No
Hydric Soil Present?	( ) Yes	(●) No	
Wetland Hydrology Present?	( ) Yes	(●) No	

Remarks:
Upland plot is located approximatley 40 feet north of sample plot 1 outside distinct depression.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dom. Sp.?	Relative % Cover	Indicator Status
1.				
2.				
3.				
4.				
	= Total Cover			
Sapling/Shrub Stratum (Plot size:)				
1.				
2.				
3.				
4.				
5.				
	= Total Cover			
Herb Stratum (Plot size: 10ft x 10ft)				
1. *Fragaria vesca*	40	Y	40.0	FACU
2. *Lupius lepidus*	20	Y	20.0	UPL
3. *Alopecurus pratensis*	15	N	15.0	FAC
4. *Equisetum arvense*	5	N	5.0	FAC
5. *Poa pratensis*	15	N	15.0	FAC
6. *Leucanthemum vulgare*	5	N	5.0	FACU
7.				
8.				
9.				
10.				
11.				
	100 = Total Cover			
Woody Vine Stratum (Plot size:)				
1.				
2.				
	= Total Cover			

% Bare Ground in Herb Stratum

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	35	x 3 =	105
FACU species	45	x 4 =	180
UPL species	20	x 5 =	100
Column Totals:	100 (A)		385 (B)

Prevalence Index = B/A = 3.850

Hydrophytic Vegetation Indicators:

- [ ] 1 - Rapid Test for Hydrophytic Vegetation
- [ ] 2 - Dominance Test is >50%
- [ ] 3 - Prevalence Index is ≤3.0[1]
- [ ] 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] 5 - Wetland Non-Vascular Plants[1]
- [ ] 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

Remarks:
None of the dominant species are rated FAC or wetter; therefore, the hydrophytic vegetation criteria is not met.

SOIL

Sampling Point: W1-SP2

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 %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-12	10YR 2/2	100					SaSiL	Sandy Silty Loam w/ Gravel

[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: (Applicble to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ 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) (except MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: Hardpan/compacted

Depth (inches): 12

Hydric Soil Present? ○ Yes ◉ No

Remarks:

No hydric soil indicators are met.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? ○ Yes ◉ No Depth (inches): _____

Water Table Present? ○ Yes ◉ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ○ Yes ◉ No Depth (inches): _____

Wetland Hydrology Present? ○ Yes ◉ No

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

Remarks:

No hydrology indicators are met.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: South Cle Elum-Westside Road | City/County: Kittitas County | Sampling Date: 5/13/2019

Applicant/Owner: Heelstone Energy | State: WA | Sampling Point: W1-SP3

Investigator(s): Kristin Murray | Section, Township, Range: S33, T20N, R15E

Landform (hillslope, terrace, etc.): terrace | Local relief (concave, convex, none): concave | Slope (%): 1-2

Subregion (LRR): A | Lat: 47.175972 | Long: -120.970292 | Datum: NAD83

Soil Map Unit Name: Patnish-Mippon-Myzel complex | NWI Classification: PFO

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	( ) No	**Is the Sampled Area within a Wetland?**	(●) Yes ( ) No
Hydric Soil Present?	(●) Yes	( ) No		
Wetland Hydrology Present?	(●) Yes	( ) No		

Remarks:
Sample plot 3 taken in forested wetland area adjacent to the stream.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 15ft x 15ft)	Absolute % Cover	Dom. Sp.?	Relative % Cover	Indicator Status
1. *Alnus rubra*	35	Y	35.0	FAC
2. *Populus tremuloides*	50	Y	50.0	FACU
3. *Salix scouleriana*	15	N	15.0	FAC
4.				
	100	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15ft x 15ft)				
1. *Cornus alba*	20	Y	26.7	FACW
2. *Rosa nutkana*	25	Y	33.3	FAC
3. *Symphoricarpos albus*	10	N	13.3	FACU
4. *Lonicera involucrata*	5	N	6.7	FAC
5. *Alnus viridis*	15	Y	20.0	FACW
	75	= Total Cover		
Herb Stratum (Plot size: 15ft x 15ft)				
1. *Equisetum arvense*	15	Y	30.6	FAC
2. *Athyrium cyclosorum*	10	Y	20.4	FAC
3. *Viola glabella*	5	N	10.2	FACW
4. *Epilobium ciliatum*	7	N	14.3	FACW
5. *Solanum dulcamara*	7	N	14.3	FAC
6. *Streptopus lanceolatus*	5	N	10.2	FAC
7.				
8.				
9.				
10.				
11.				
	49	= Total Cover		
Woody Vine Stratum (Plot size:)				
1.				
2.				
		= Total Cover		

% Bare Ground in Herb Stratum 51

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 85.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	47	x 2 =	94
FAC species	117	x 3 =	351
FACU species	60	x 4 =	240
UPL species	0	x 5 =	0
Column Totals:	224 (A)		685 (B)

Prevalence Index = B/A = 3.058

Hydrophytic Vegetation Indicators:

- [ ] 1 - Rapid Test for Hydrophytic Vegetation
- [x] 2 - Dominance Test is >50%
- [ ] 3 - Prevalence Index is ≤3.0[1]
- [ ] 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] 5 - Wetland Non-Vascular Plants[1]
- [ ] 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

Remarks:
More than 50% of the vegetation is rated FAC or wetter; therefore, the hydrophytic vegetation criteria is met. Other species observed in the wetland includes black cottonwood, red alder, Geyer's willow, Douglas spirea, western crabapple, small fruited bulrush, reed canarygrass, stinging nettle.

SOIL

Sampling Point: W1-SP3

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 %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-12	10YR 2/1	100					Muck	

[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: (Applicble to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☑ Hydrogen Sulfide (A4)
- ☐ 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) (except MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☑ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: Hardpan

Depth (inches): 12

Hydric Soil Present? ◉ Yes ○ No

Remarks:

Hydric soil indicators A4 and A10 are met.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	◉ Yes	○ No	Depth (inches):	1
Water Table Present?	◉ Yes	○ No	Depth (inches):	1
Saturation Present? (includes capillary fringe)	◉ Yes	○ No	Depth (inches):	0

Wetland Hydrology Present? ◉ Yes ○ No

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

Remarks:

Three primary indicators, A1, A2, and A3 are met. 2-3 inches of flowing water near plot.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: South Cle Elum-Westside Road | City/County: Kittitas County | Sampling Date: 5/14/2019

Applicant/Owner: Heelstone Energy | State: WA | Sampling Point: W1-SP4

Investigator(s): Kristin Murray | Section, Township, Range: S33, T20N, R15E

Landform (hillslope, terrace, etc.): terrace | Local relief (concave, convex, none): convex | Slope (%): 2

Subregion (LRR): A | Lat: 47.176747 | Long: -120.965208 | Datum: NAD83

Soil Map Unit Name: Patnish-Mippon-Myzel complex | 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	(●) No	**Is the Sampled Area within a Wetland?** ( ) Yes (●) No
Hydric Soil Present?	( ) Yes	(●) No	
Wetland Hydrology Present?	( ) Yes	(●) No	

Remarks:
Upland plot is taken on elevated fill area located within the middle of Wetland 1 near the eastern property boundary.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 20ft x 20ft)	Absolute % Cover	Dom. Sp.?	Relative % Cover	Indicator Status
1. *Populus tremuloides*	20	Y	100.0	FACU
2.				
3.				
4.				
	20	= Total Cover		
Sapling/Shrub Stratum (Plot size: 20ft x 20ft)				
1. *Populus tremuloides*	15	Y	75.0	FACU
2. *Symphoricarpos albus*	5	Y	25.0	FACU
3.				
4.				
5.				
	20	= Total Cover		
Herb Stratum (Plot size: 10ft x 10ft)				
1. *Mahonia nervosa*	30	Y	35.7	FACU
2. *Poa bulbosa*	35	Y	41.7	FACU
3. *Myosotis arvensis*	15	N	17.9	FACU
4. *Fritillaria camschatcensis*	2	N	2.4	FACW
5. *Solidago lepida*	2	N	2.4	FAC
6.				
7.				
8.				
9.				
10.				
11.				
	84	= Total Cover		
Woody Vine Stratum (Plot size:)				
1.				
2.				
		= Total Cover		

% Bare Ground in Herb Stratum 16

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 5 (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	2	x 2 =	4
FAC species	2	x 3 =	6
FACU species	120	x 4 =	480
UPL species	0	x 5 =	0
Column Totals:	124 (A)		490 (B)

Prevalence Index = B/A = 3.952

Hydrophytic Vegetation Indicators:

- [ ] 1 - Rapid Test for Hydrophytic Vegetation
- [ ] 2 - Dominance Test is >50%
- [ ] 3 - Prevalence Index is ≤3.0[1]
- [ ] 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] 5 - Wetland Non-Vascular Plants[1]
- [ ] 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

Remarks:
None of the dominant vegetation is rated FAC or wetter. The hydrophtic vegetation criteria is not met.

SOIL

Sampling Point: W1-SP4

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 %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-6	10YR 2/2	100					Sandy Loam	w/ Gravel

[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: (Applicble to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ 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) (except MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: Hardpan

Depth (inches): 6

Hydric Soil Present? ○ Yes ◉ No

Remarks:

None of the hydric soil indicators are met.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? ○ Yes ◉ No Depth (inches): _____

Water Table Present? ○ Yes ◉ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ○ Yes ◉ No Depth (inches): _____

Wetland Hydrology Present? ○ Yes ◉ No

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

Remarks:

No hydrology indicators are met.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: South Cle Elum-Westside Road | City/County: Kittitas County | Sampling Date: 5/13/2019

Applicant/Owner: Heelstone Energy | State: WA | Sampling Point: W2-SP1

Investigator(s): Kristin Murray | Section, Township, Range: S33, T20N, R15E

Landform (hillslope, terrace, etc.): terrace | Local relief (concave, convex, none): concave | Slope (%): 3-5

Subregion (LRR): A | Lat: 47.178295 | Long: -120.970982 | Datum: NAD83

Soil Map Unit Name: Xerofluvents | NWI Classification: PEM

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	( ) No	**Is the Sampled Area within a Wetland?**	(●) Yes ( ) No
Hydric Soil Present?	(●) Yes	( ) No		
Wetland Hydrology Present?	(●) Yes	( ) No		

Remarks:
Sample plot taken along the emergent edge of excavated pond.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dom. Sp.?	Relative % Cover	Indicator Status
1.				
2.				
3.				
4.				
	= Total Cover			
Sapling/Shrub Stratum (Plot size:)				
1.				
2.				
3.				
4.				
5.				
	= Total Cover			
Herb Stratum (Plot size: 15ft x 15ft)				
1. *Typha latifolia*	45	Y	48.9	OBL
2. *Scirpus microcarpus*	15	N	16.3	OBL
3. *Juncus effusus*	20	Y	21.7	FACW
4. *Phalaris arundinacea*	5	N	5.4	FACW
5. *Carex leporina*	5	N	5.4	FACW
6. *Taraxacum officinale*	2	N	2.2	FACU
7.				
8.				
9.				
10.				
11.				
	92 = Total Cover			
Woody Vine Stratum (Plot size:)				
1.				
2.				
	= Total Cover			

% Bare Ground in Herb Stratum 8

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	60	x 1 =	60
FACW species	30	x 2 =	60
FAC species	0	x 3 =	0
FACU species	2	x 4 =	8
UPL species	0	x 5 =	0
Column Totals:	92 (A)		128 (B)

Prevalence Index = B/A = 1.391

Hydrophytic Vegetation Indicators:

- [ ] 1 - Rapid Test for Hydrophytic Vegetation
- [x] 2 - Dominance Test is >50%
- [x] 3 - Prevalence Index is ≤3.0[1]
- [ ] 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] 5 - Wetland Non-Vascular Plants[1]
- [ ] 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

Remarks:
100% of the dominant vegetation is rated FACW or OBL; therefore, the hydrophytic vegetation criteria is met. Some scattered shrub vegetation is present in the wetland including black cottonwood saplings, Douglas spirea, rose, and willow.

SOIL

Sampling Point: W2-SP1

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 %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-10	10YR 2/2	100					Mucky loamy sanc	with gravel

[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: (Applicble to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ 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) (except MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: Hardpan/gravel

Depth (inches): 10

Hydric Soil Present? ◉ Yes ○ No

Remarks:

Soils meet the F1 hydric soil indicator.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	◉ Yes	○ No	Depth (inches):	1
Water Table Present?	◉ Yes	○ No	Depth (inches):	1
Saturation Present? (includes capillary fringe)	◉ Yes	○ No	Depth (inches):	0

Wetland Hydrology Present? ◉ Yes ○ No

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

Remarks:

Soils meet primary hydrology indicators A1, A2, and A3.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: South Cle Elum-Westside Road | City/County: Kittitas County | Sampling Date: 5/14/2019

Applicant/Owner: Heelstone Energy | State: WA | Sampling Point: W2-SP2

Investigator(s): Kristin Murray | Section, Township, Range: S33, T20N, R15E

Landform (hillslope, terrace, etc.): terrace | Local relief (concave, convex, none): convex | Slope (%): 1-2

Subregion (LRR): A | Lat: 47.177607 | Long: -120.970478 | Datum: NAD83

Soil Map Unit Name: Xerofluvents | 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	(●) No	**Is the Sampled Area within a Wetland?** ( ) Yes (●) No
Hydric Soil Present?	( ) Yes	(●) No	
Wetland Hydrology Present?	( ) Yes	(●) No	

Remarks:
Sample plot located along the southern edge of Wetland 1 in field with scattered small ponderosa pines.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 20ft x 20ft)	Absolute % Cover	Dom. Sp.?	Relative % Cover	Indicator Status
1. *Pinus ponderosa*	20	Y	100.0	FACU
2.				
3.				
4.				
	20	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15ft x 15ft)				
1. *Symphoricarpos albus*	5	Y	33.3	FACU
2. *Rosa nutkana*	10	Y	66.7	FAC
3.				
4.				
5.				
	15	= Total Cover		
Herb Stratum (Plot size: 15ft x 15ft)				
1. *Leucanthemum vulgare*	15	N	15.2	FACU
2. *Alopecurus pratensis*	55	Y	55.6	FAC
3. *Solidago lepida*	5	N	5.1	FAC
4. *Taraxacum officinale*	2	N	2.0	FACU
5. *Equisetum arvense*	7	N	7.1	FAC
6. *Daucus carota*	5	N	5.1	FACU
7. *Dactylis glomerata*	10	N	10.1	FACU
8.				
9.				
10.				
11.				
	99	= Total Cover		
Woody Vine Stratum (Plot size:)				
1.				
2.				
		= Total Cover		

% Bare Ground in Herb Stratum 1

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	77	x 3 =	231
FACU species	57	x 4 =	228
UPL species	0	x 5 =	0
Column Totals:	134 (A)		459 (B)

Prevalence Index = B/A = 3.425

Hydrophytic Vegetation Indicators:

- [ ] 1 - Rapid Test for Hydrophytic Vegetation
- [ ] 2 - Dominance Test is >50%
- [ ] 3 - Prevalence Index is ≤3.0[1]
- [ ] 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] 5 - Wetland Non-Vascular Plants[1]
- [ ] 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

Remarks:
Not more than 50% of the vegetation is rated FAC or wetter; therefore, the hydrophytic vegetation criteria is not met.

SOIL

Sampling Point: W2-SP2

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 %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-6	10YR 4/2	100					Silt Loam	w/ Sand

[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: (Applicble to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ 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) (except MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: Hardpan/compacted

Depth (inches): 6

Hydric Soil Present? ○ Yes ◉ No

Remarks:

No hydric soil indicators are met. Soils are very compacted.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? ○ Yes ◉ No Depth (inches): _____

Water Table Present? ○ Yes ◉ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ○ Yes ◉ No Depth (inches): _____

Wetland Hydrology Present? ○ Yes ◉ No

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

Remarks:

No hydrology indicators are met.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: South Cle Elum-Westside Road | City/County: Kittitas County | Sampling Date: 5/14/2019

Applicant/Owner: Heelstone Energy | State: WA | Sampling Point: UP1-SP1

Investigator(s): Kristin Murray | Section, Township, Range: S33, T20N, R15E

Landform (hillslope, terrace, etc.): terrace | Local relief (concave, convex, none): concave | Slope (%): 1-2

Subregion (LRR): A | Lat: 47.17788 | Long: -120.969136 | Datum: NAD83

Soil Map Unit Name: Xerofluvents | 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	( ) No	**Is the Sampled Area within a Wetland?** ( ) Yes (●) No
Hydric Soil Present?	( ) Yes	(●) No	
Wetland Hydrology Present?	( ) Yes	(●) No	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dom. Sp.?	Relative % Cover	Indicator Status
1.				
2.				
3.				
4.				
	= Total Cover			
Sapling/Shrub Stratum (Plot size:)				
1.				
2.				
3.				
4.				
5.				
	= Total Cover			
Herb Stratum (Plot size: 15ft x 15ft)				
1. *Alopecurus pratensis*	70	Y	72.9	FAC
2. *Lupius lepidus*	15	N	15.6	UPL
3. *Equisetum arvense*	2	N	2.1	FAC
4. *Symphoricarpos albus*	2	N	2.1	FACU
5. *Rosa nutkana*	2	N	2.1	FAC
6. *Solidago lepida*	5	N	5.2	FAC
7.				
8.				
9.				
10.				
11.				
	96 = Total Cover			
Woody Vine Stratum (Plot size:)				
1.				
2.				
	= Total Cover			

% Bare Ground in Herb Stratum 4

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	79	x 3 =	237
FACU species	2	x 4 =	8
UPL species	15	x 5 =	75
Column Totals:	96 (A)		320 (B)

Prevalence Index = B/A = 3.333

Hydrophytic Vegetation Indicators:

- [ ] 1 - Rapid Test for Hydrophytic Vegetation
- [x] 2 - Dominance Test is >50%
- [ ] 3 - Prevalence Index is ≤3.0[1]
- [ ] 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] 5 - Wetland Non-Vascular Plants[1]
- [ ] 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

Remarks:

The dominant vegetation is rated FAC; therefore, the hydrophytic vegetation criteria is met.

SOIL

Sampling Point: UP1-SP1

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
0-14	10YR 3/2	95	10YR 3/3	5	C	M	Silt Loam	concentration is faint

[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: (Applicble to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ 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) (except MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? ○ Yes ◉ No

Remarks:
No hydric soils are present.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? ○ Yes ◉ No Depth (inches): _____

Water Table Present? ○ Yes ◉ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ○ Yes ◉ No Depth (inches): _____

Wetland Hydrology Present? ○ Yes ◉ No

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

Remarks:
No hydrology indicators are met. Soils are moist but not saturated.

Appendix B-1: Comparison of Observed and Normal Precipitation

The Regional Delineation Supplement Version 2.0 (USACE 2010) recommends using methods described in Chapter 19 in *Engineering Field Handbook* (NRCS 1997) to determine if precipitation occurring in the three full months prior to a site visit was normal, drier than normal, or wetter than normal. Actual rainfall is compared to the normal range of the 30-year average. Precipitation conditions were normal in the three months prior to May 13th, 2019 field work (Table 1). Drier than normal precipitation occurred in the ten days prior to the May field work with 0.00 inches of rainfall (Table 2). The nearest WETS station location in Cle Elum, Washington was selected to determine if normal precipitation conditions were present prior to field work.

Table 1. For May 13th, 2019 field work - Monthly precipitation data for Cle Elum, Washington.

		Long-term rainfall records[a]							
	Month	3 yrs. in 10 less than	Average	3 yrs. in 10 more than	Rain fall[b]	Condition dry, wet, normal[c]	Condition Value	Month weight value	Product of previous two columns
1st prior month	February	1.56	2.62	3.18	1.61	N	2	3	5
2nd prior month	March	1.14	1.69	2.02	0.43	D	1	2	3
3rd prior month	April	0.78	1.14	1.36	1.24	N	2	1	3
								Sum	11

[a] NRCS 1997.

[b] NRCS 2018, 2019.

[c] Conditions are considered normal if they fall within the low and high range around the average.

Note: If sum is

6 - 9 then prior period has been drier than normal

10 - 14 then period has been normal

15 - 18 then period has been wetter than normal

Condition value:

Dry (D) =1

Normal (N) =2

Wet (W) =3

Conclusion: Normal precipitation conditions were present 3 months prior to field work, but drier than normal precipitation conditions were present 10 days prior to the May 13th field work.

Table 2. Daily Precipitation 10 days preceding May 13th, 2019, field work

Date (2019)	Daily Precipitation (inches) [a]
May 12	0.00
May 11	0.00
May 10	0.00
May 9	0.00
May 8	0.00
May 7	0.00
May 6	-
May 5	-
May 4	-
May 3	0.00

[a] NRCS 2019

References:

NRCS 1997. Natural Resource Conservation Service. 1997. Hydrology Tools for wetland determination. Chapter 19 in Engineering Field Handbook. Fort Worth (TX): US. Department of Agriculture, NRCS. https://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17556.wba

NRCS. 2018, 2019. Natural Resources Conservation Service [Internet]. December 2018; January, February, March 2019. US Department of Agriculture. Climate Data for Cle Elum, WA. Available at: http://agacis.rcc-acis.org/?fips=53037

Wetland name or number 1

RATING SUMMARY – Eastern Washington

Name of wetland (or ID #): Wetland 1 Date of site visit: 5/13/2019

Rated by Kristin Murray Trained by Ecology? ☑ Yes ☐ No Date of training 9/12/2018

HGM Class used for rating Depressional Wetland has multiple HGM classes? ☑ Yes ☐ No

NOTE: Form is not complete with out the figures requested (*figures can be combined*).
Source of base aerial photo/map ArcGIS

OVERALL WETLAND CATEGORY I (based on functions ☐ or special characteristics ☑)

1. Category of wetland based on FUNCTIONS

_____ **Category I** - Total score = 22 - 27
X **Category II** - Total score = 19 - 21
_____ **Category III** - Total score = 16 - 18
_____ **Category IV** - Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	List appropriate rating (H, M, L)			
Site Potential	M	M	M	
Landscape Potential	H	M	H	
Value	H	L	H	Total
Score Based on Ratings	8	5	8	**21**

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
Vernal Pools	
Alkali	
Wetland of High Conservation Value	
Bog and Calcareous Fens	
Old Growth or Mature Forest - slow growing	
Aspen Forest	I
Old Growth or Mature Forest - fast growing	
Floodplain forest	
None of the above	

Wetland name or number 1

Maps and Figures required to answer questions correctly for Eastern Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	D 1.3, H 1.1, H 1.5	1
Hydroperiods (including area of open water for H 1.3)	D 1.4, H 1.2, H 1.3	1
Location of outlet (*can be added to map of hydroperiods*)	D 1.1, D 4.1	1
Boundary of area within 150 ft of the wetland (*can be added to another figure*)	D 2.2, D 5.2	2
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	4
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	5
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	D 3.3	6

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	

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?
   - ☑ The wetland is on a slope (*slope can be very gradual*),
   - ☑ 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;
   - ☐ 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.

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 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.*

NOTES and FIELD OBSERVATIONS:
Seeps from the Westside Road slope contribute to the wetland. In addition, a stream feature is located on the south side of the wetland at the toe of the slope. Wetland has multiple classes but is overall Depressional.

Wetland name or number 1

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	3
☑ Wetland has a highly constricted permanently flowing outlet		points = 3	
Wetland has a permanently flowing, unconstricted, surface outlet		points = 1	
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	3
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	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	
D 1.4. Characteristics of seasonal ponding or inundation:			
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	1
Area seasonally ponded is ¼ - ½ total area of wetland		points = 1	
Area seasonally ponded is < ¼ total area of wetland		points = 0	
Total for D 1	Add the points in the boxes above		**10**

Rating of Site Potential If score is: ☐ **12 - 16 = H** ☑ **6 - 11 = M** ☐ **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	1
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
D 2.3. Are there septic systems within 250 ft of the wetland?	Yes = 1	No = 0	1
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?			0
Source	Yes = 1	No = 0	
Total for D 2	Add the points in the boxes above		**3**

Rating of Landscape Potential If score is: ☑ **3 or 4 = H** ☐ **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	2
Total for D 3	Add the points in the boxes above		**2**

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

Wetland name or number 1

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

6

Total for D 4 — Add the points in the boxes above: **10**

Rating of Site Potential If score is: ☐12 - 16 = H ☑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	1
D 5.2. Is > 10% of the area within 150 ft of the wetland in land uses that generates runoff?	Yes = 1 No = 0	1
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses ?	Yes = 1 No = 0	0
Total for D 5	Add the points in the boxes above	2

Rating of Landscape Potential If score is: ☐ 3 = H ☑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. — points = 0

Explain why culverts under driveways

☐ There are no problems with flooding downstream of the wetland — points = 0

D 6.2. Has the site 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 ☑0 = L — *Record the rating on the first page*

Wetland name or number 1

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 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) ☑ Forested (areas where trees have > 30% cover) 4 or more checks: points = 3 3 checks: points = 2 2 checks: points - 1 1 check: points = 0	3
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	3
H 1.4. Richness of plant species Count the number of plant species in the wetland that cover at least 10 ft^2. *Different 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 11 Scoring: > 9 species: points = 2 4 - 9 species: points = 1 < 4 species: points = 0	2
H 1.4. 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  Riparian braided channels with 2 classes	3

Wetland name or number 1

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	
☐ Invasive species cover less than 20% in each stratum of vegetation (*canopy, sub-canopy, shrubs, herbaceous, moss/ground cover*)	
Total for H 1 — Add the points in the boxes above	**11**

Rating of Site Potential If Score is: ☐ **15 - 18 = H** ☑ **7 - 14 = M** ☐ **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:* 0 % undisturbed habitat + (20 % moderate & low intensity land uses / 2) = 10%	
> 1/3 (33.3%) of 1 km Polygon — points = 3	1
20 - 33% of 1 km Polygon — points = 2	
10 - 19% of 1 km Polygon — points = 1	
< 10 % of 1 km Polygon — points = 0	
H 2.2. Undisturbed habitat in 1 km Polygon around wetland. *Calculate:* 45 % undisturbed habitat + (45 % moderate & low intensity land uses / 2) = 67.5%	
Undisturbed habitat > 50% of Polygon — points = 3	3
Undisturbed habitat 10 - 50% and in 1 - 3 patches — points = 2	
Undisturbed habitat 10 - 50% and > 3 patches — points = 1	
Undisturbed habitat < 10% of 1 km Polygon — points = 0	
H 2.3 Land use intensity in 1 km Polygon:	
> 50% of 1 km Polygon is high intensity land use — points = (-2)	0
Does not meet criterion above — points = 0	
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 — Add the points in the boxes above	**4**

Rating of Landscape Potential If Score is: ☑ **4 - 9 = H** ☐ **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 only the highest score that applies to the wetland being rated.*	
Site meets ANY of the following criteria: — points = 2	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	
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	

Rating of Value If Score is: ☑ **2 = H** ☐ **1 = M** ☐ **0 = L** *Record the rating on the first page*

Wetland name or number 1

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	Category
Check off any criteria that apply to the wetland. List the category when the appropriate criteria are met.	
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 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**	
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**	
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 ⅓ 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**	
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 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 to SC 3.4** ☐ No = **Not WHCV** SC 3.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? ☐ Yes = **Category I** ☐ No = **Not WHCV**	

Wetland name or number 1

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**

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*

☐ 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
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	**Cat. I**

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 unit: ***NOTE**: This question is independent of the land use between the wetland unit 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.
- ☐ **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 > 20 in (51 cm) in western 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.

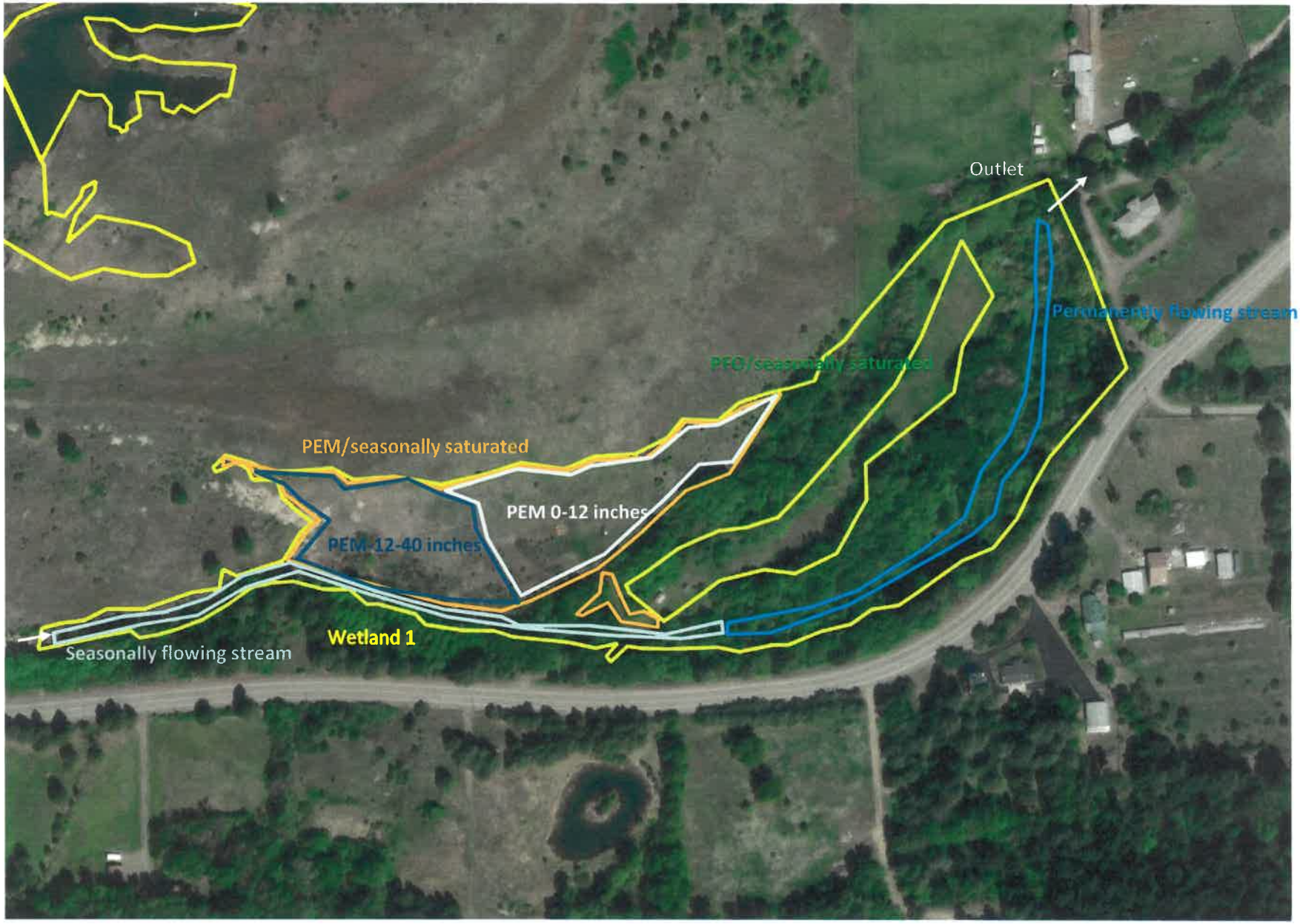


Figure 1. Wetland 1: Cowardin, hydroperiod, outlet.

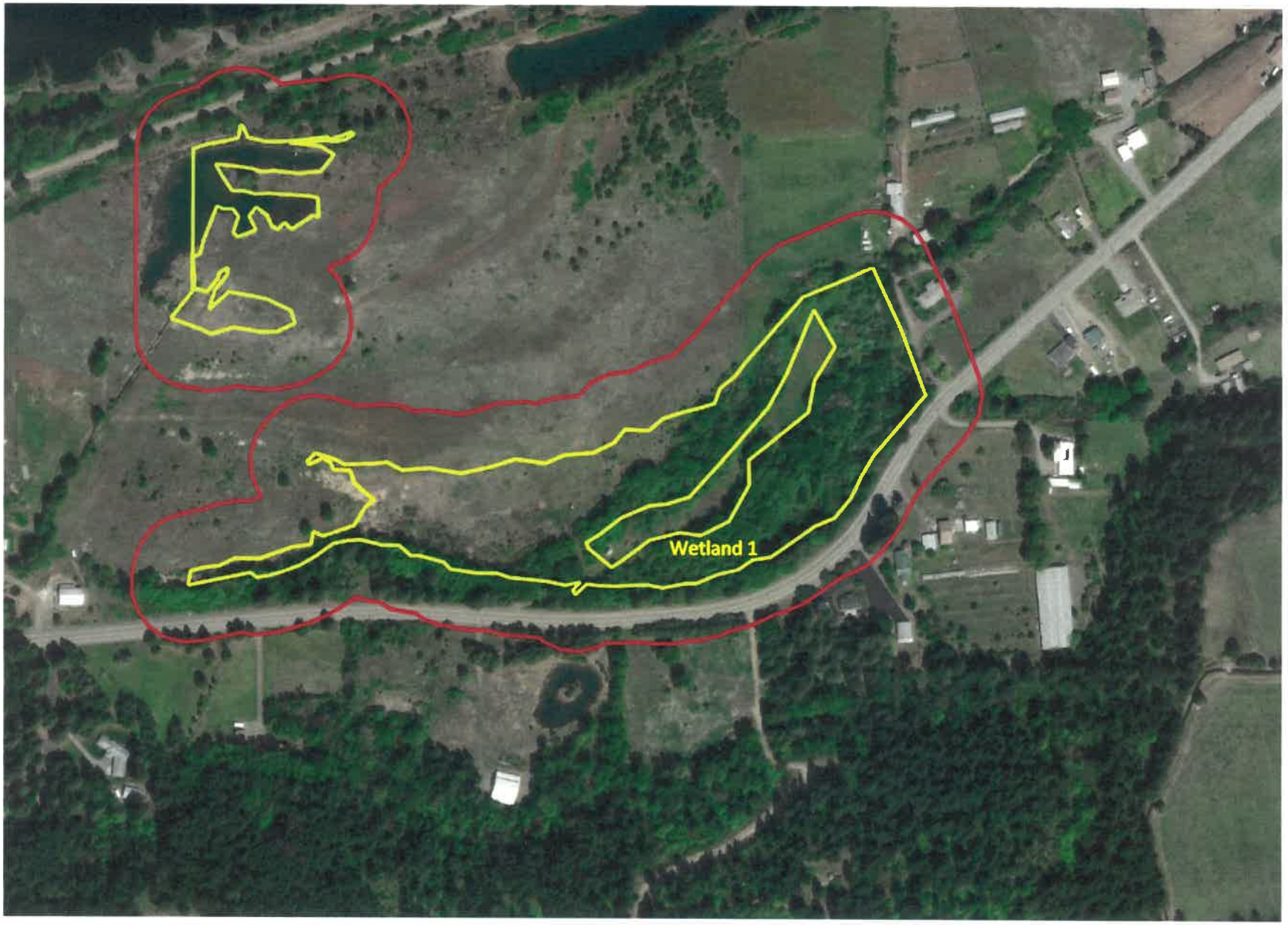


Figure 2. Wetland 1 150-foot buffer (in red).

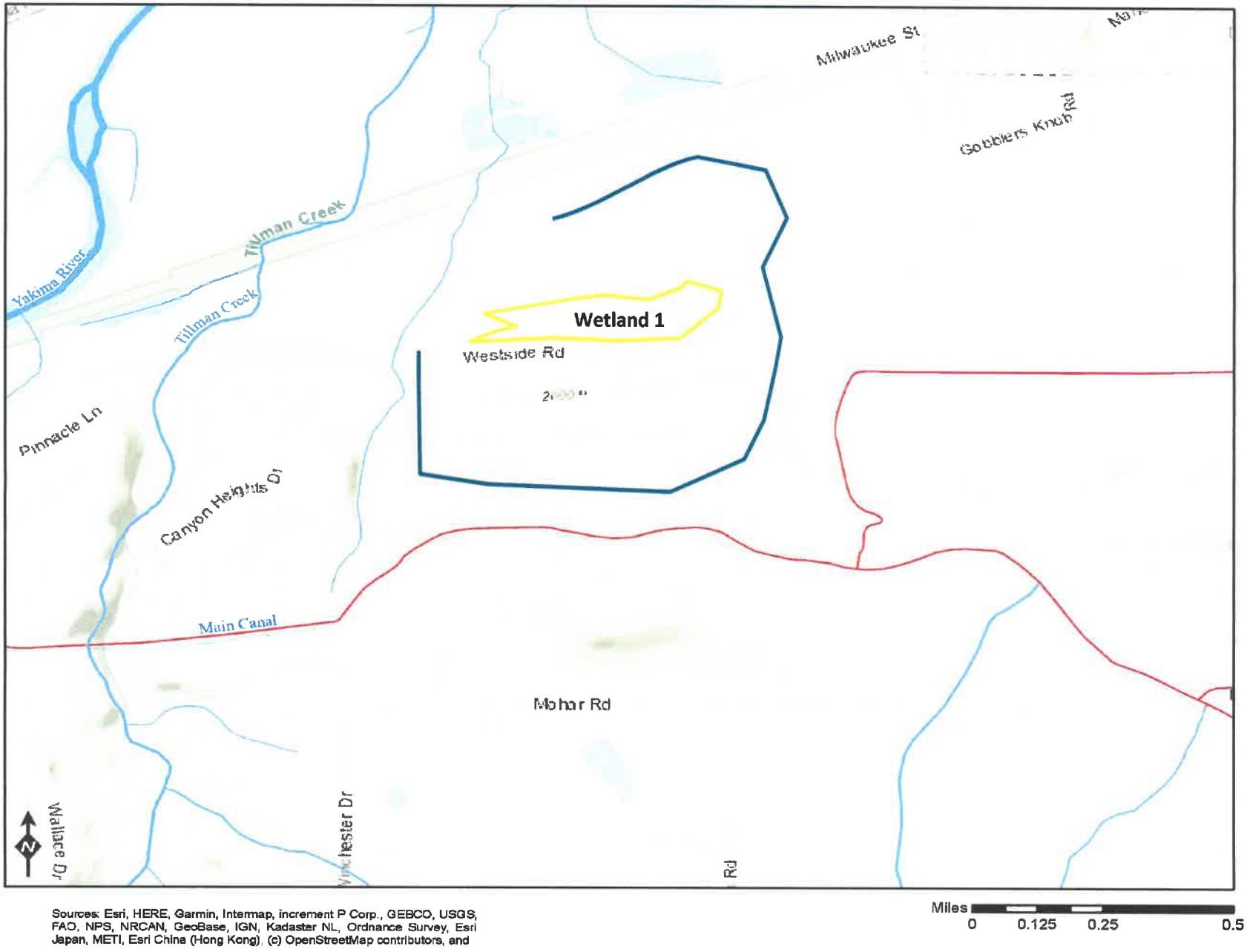


Figure 3. Wetland 1 estimated Contributing Basin (in blue).

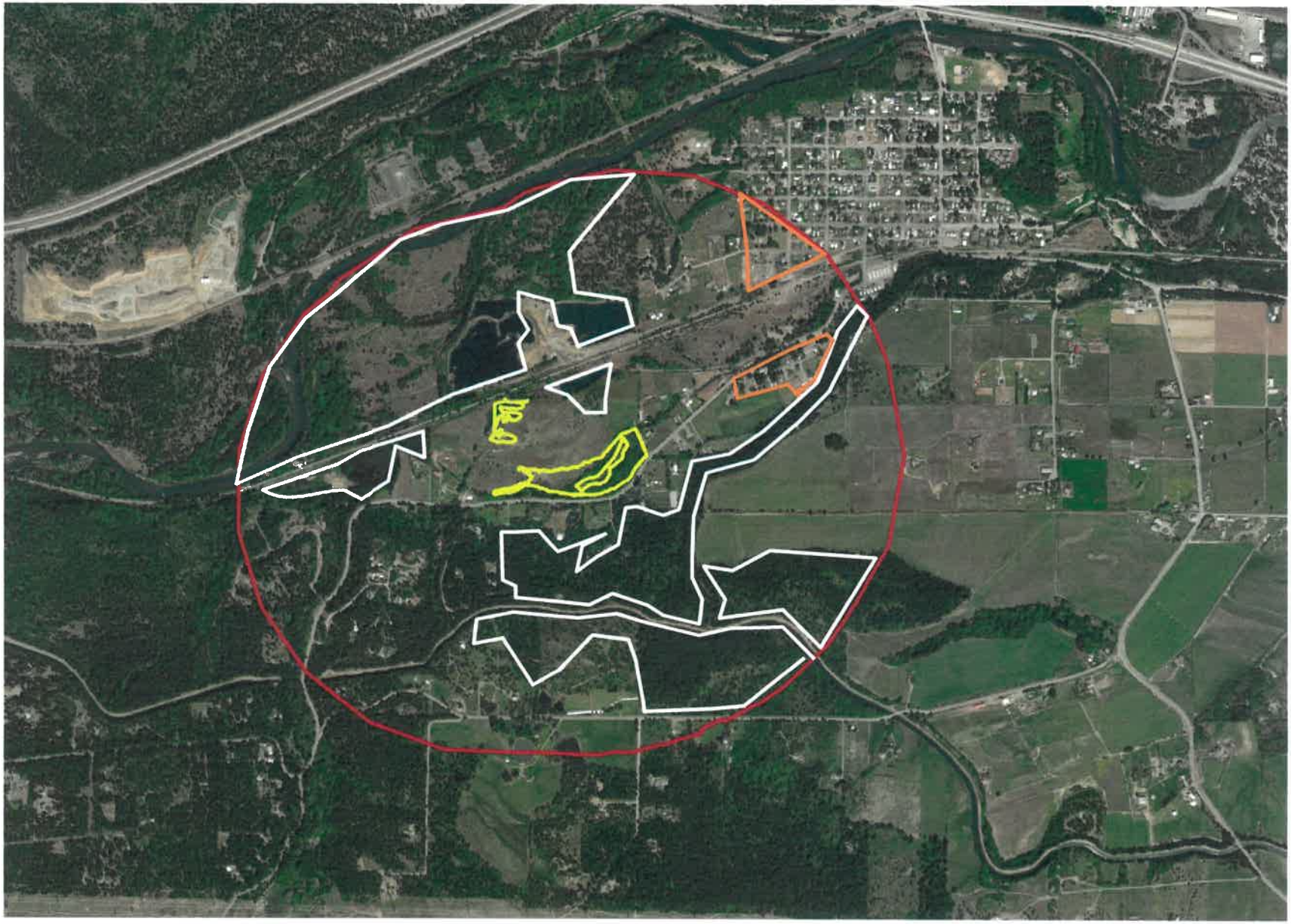


Figure 4. 1 KM buffer around Wetland 1. Relatively undisturbed areas (in white). High intensity (high intensity agriculture in orange). Remaining land use in low/moderate use (less than 1 residence/acre, forestry).

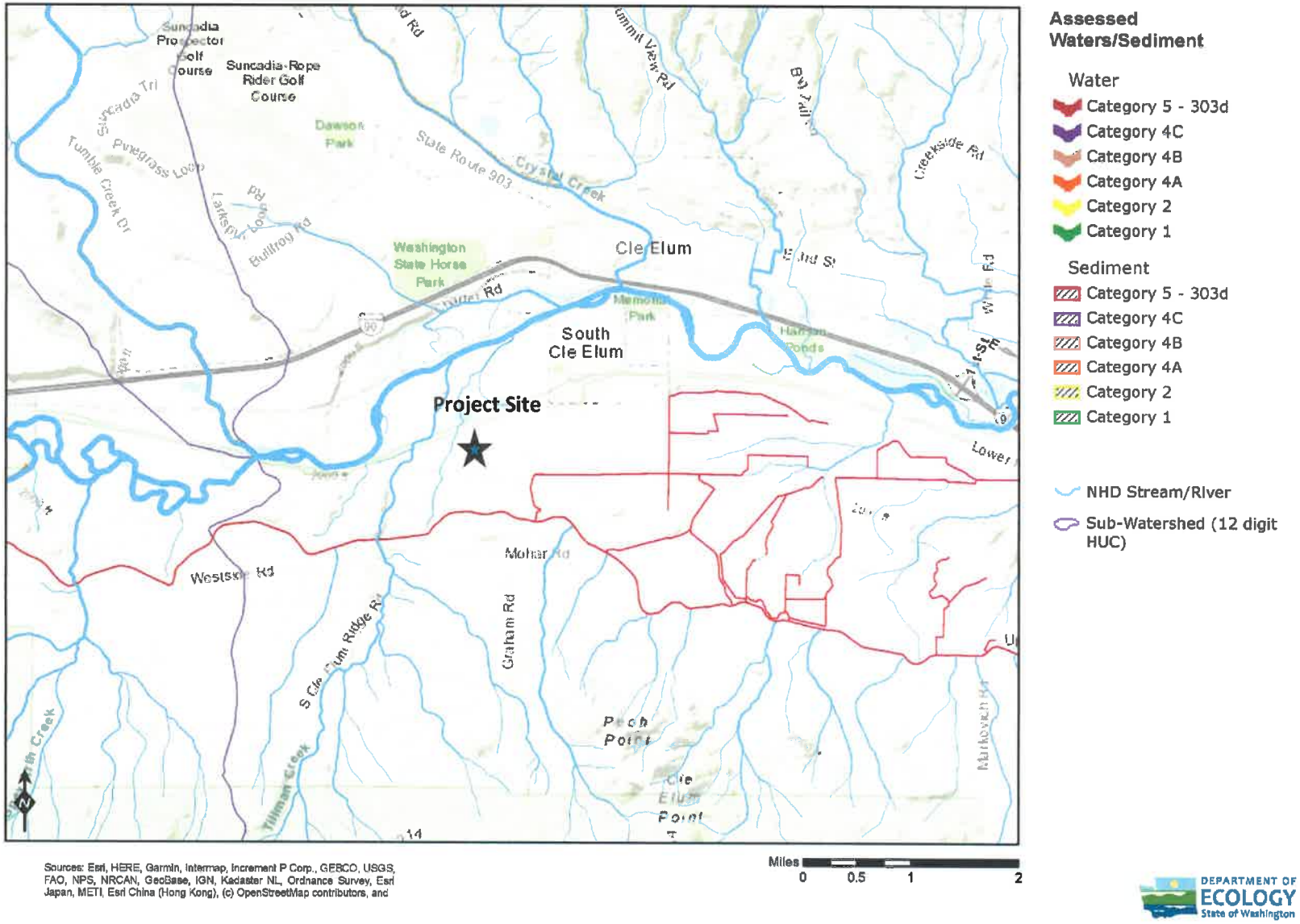


Figure 5. Wetland features do not drain to waters with 303 (d) listing within 1 mile of project site.

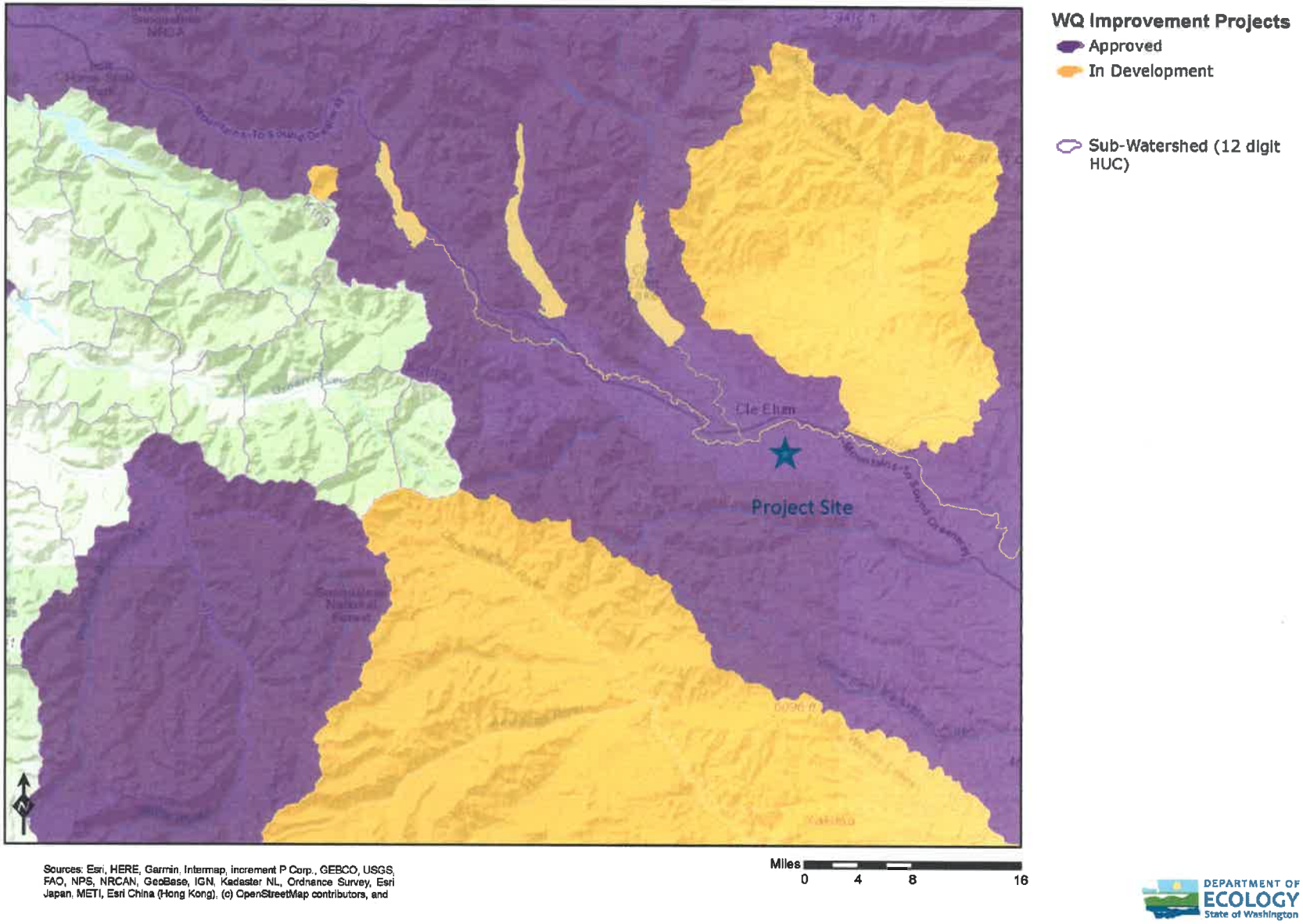


Figure 6. TMDL in Upper Yakima River basin for pollutants and temperature.

Wetland name or number 2

RATING SUMMARY – Eastern Washington

Name of wetland (or ID #): Wetland 2 Date of site visit: 5/13/2019

Rated by Kristin Murray Trained by Ecology? ☑ Yes ☐ No Date of training 9/12/2018

HGM Class used for rating Depressional Wetland has multiple HGM classes? ☑ Yes ☐ No

NOTE: Form is not complete with out the figures requested (*figures can be combined*).
Source of base aerial photo/map ESRI GIS

OVERALL WETLAND CATEGORY II (based on functions ☑ or special characteristics ☐)

1. Category of wetland based on FUNCTIONS

_____ **Category I** - Total score = 22 - 27
X **Category II** - Total score = 19 - 21
_____ **Category III** - Total score = 16 - 18
_____ **Category IV** - Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	List appropriate rating (H, M, L)			
Site Potential	M	H	M	
Landscape Potential	M	M	H	
Value	H	L	M	**Total**
Score Based on Ratings	7	6	7	**20**

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
Vernal Pools	
Alkali	
Wetland of High Conservation Value	
Bog and Calcareous Fens	
Old Growth or Mature Forest - slow growing	
Aspen Forest	
Old Growth or Mature Forest - fast growing	
Floodplain forest	
None of the above	**X**

Wetland name or number 2

Maps and Figures required to answer questions correctly for Eastern Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	D 1.3, H 1.1, H 1.5	1
Hydroperiods (including area of open water for H 1.3)	D 1.4, H 1.2, H 1.3	1
Location of outlet (*can be added to map of hydroperiods*)	D 1.1, D 4.1	1
Boundary of area within 150 ft of the wetland (*can be added to another figure*)	D 2.2, D 5.2	2
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	4
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	5
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	D 3.3	6

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	

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?
   - ☐ The wetland is on a slope (*slope can be very gradual*),
   - ☐ 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;
   - ☐ 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.

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 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.*

NOTES and FIELD OBSERVATIONS:
Much of the wetland is open water pond that has been excavated with an emergent and shrub fringe. Wetland extends off-site to the west.

Wetland name or number 2

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	3
☑ Wetland has a highly constricted permanently flowing outlet	points = 3	
Wetland has a permanently flowing, unconstricted, surface outlet	points = 1	
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	1
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	
D 1.4. Characteristics of seasonal ponding or inundation:		
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	3
Area seasonally ponded is ¼ - ½ total area of wetland	points = 1	
Area seasonally ponded is < ¼ total area of wetland	points = 0	
Total for D 1	Add the points in the boxes above	7

Rating of Site Potential If score is: ☐ **12 - 16 = H** ☑ **6 - 11 = M** ☐ **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
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	
Total for D 2	Add the points in the boxes above	1

Rating of Landscape Potential If score is: ☐ **3 or 4 = H** ☑ **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	2
Total for D 3	Add the points in the boxes above	2

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

Wetland name or number 2

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	8
Total for D 4 — Add the points in the boxes above	12

Rating of Site Potential If score is: ☑ **12 - 16 = H** ☐ **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 land uses that generates runoff? Yes = 1 No = 0	1
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses ? Yes = 1 No = 0	0
Total for D 5 — Add the points in the boxes above	1

Rating of Landscape Potential If score is: ☐ **3 = H** ☑ **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. — points = 0 *Explain why* culvert under the trail ☐ There are no problems with flooding downstream of the wetland — points = 0	0
D 6.2. Has the site 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** ☑ **0 = L** *Record the rating on the first page*

Wetland name or number 2

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 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) ☐ Forested (areas where trees have > 30% cover) 4 or more checks: points = 3 3 checks: points = 2 2 checks: points - 1 1 check: points = 0	2
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	3
H 1.4. Richness of plant species Count the number of plant species in the wetland that cover at least 10 ft^2. *Different 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 8 Scoring: > 9 species: points = 2 4 - 9 species: points = 1 < 4 species: points = 0	1
H 1.4. 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  Riparian braided channels with 2 classes	2

Wetland name or number 2

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 ☐ Invasive species cover less than 20% in each stratum of vegetation (*canopy, sub-canopy, shrubs, herbaceous, moss/ground cover*)	3
Total for H 1 — Add the points in the boxes above	**11**

Rating of Site Potential If Score is: ☐ **15 - 18 = H** ☑ **7 - 14 = M** ☐ **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:* 0 % undisturbed habitat + (20 % moderate & low intensity land uses / 2) = 10% > 1/3 (33.3%) of 1 km Polygon — points = 3 20 - 33% of 1 km Polygon — points = 2 10 - 19% of 1 km Polygon — points = 1 < 10 % of 1 km Polygon — points = 0	1
H 2.2. Undisturbed habitat in 1 km Polygon around wetland. *Calculate:* 45 % undisturbed habitat + (45 % moderate & low intensity land uses / 2) = 67.5% Undisturbed habitat > 50% of Polygon — points = 3 Undisturbed habitat 10 - 50% and in 1 - 3 patches — points = 2 Undisturbed habitat 10 - 50% and > 3 patches — points = 1 Undisturbed habitat < 10% of 1 km Polygon — points = 0	3
H 2.3 Land use intensity in 1 km Polygon: > 50% of 1 km Polygon is high intensity land use — points = (-2) Does not meet criterion above — points = 0	0
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 — Add the points in the boxes above	**4**

Rating of Landscape Potential If Score is: ☑ **4 - 9 = H** ☐ **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 only 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 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** ☑ **1 = M** ☐ **0 = L** *Record the rating on the first page*

Wetland name or number 2

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	Category
Check off any criteria that apply to the wetland. List the category when the appropriate criteria are met.	
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 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**	
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**	
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 ⅓ 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**	
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 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 to SC 3.4** ☐ No = **Not WHCV** SC 3.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? ☐ Yes = **Category I** ☐ No = **Not WHCV**	

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**

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*

☐ 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**

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 unit: ***NOTE**: This question is independent of the land use between the wetland unit 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.
- ☐ **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 > 20 in (51 cm) in western 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.

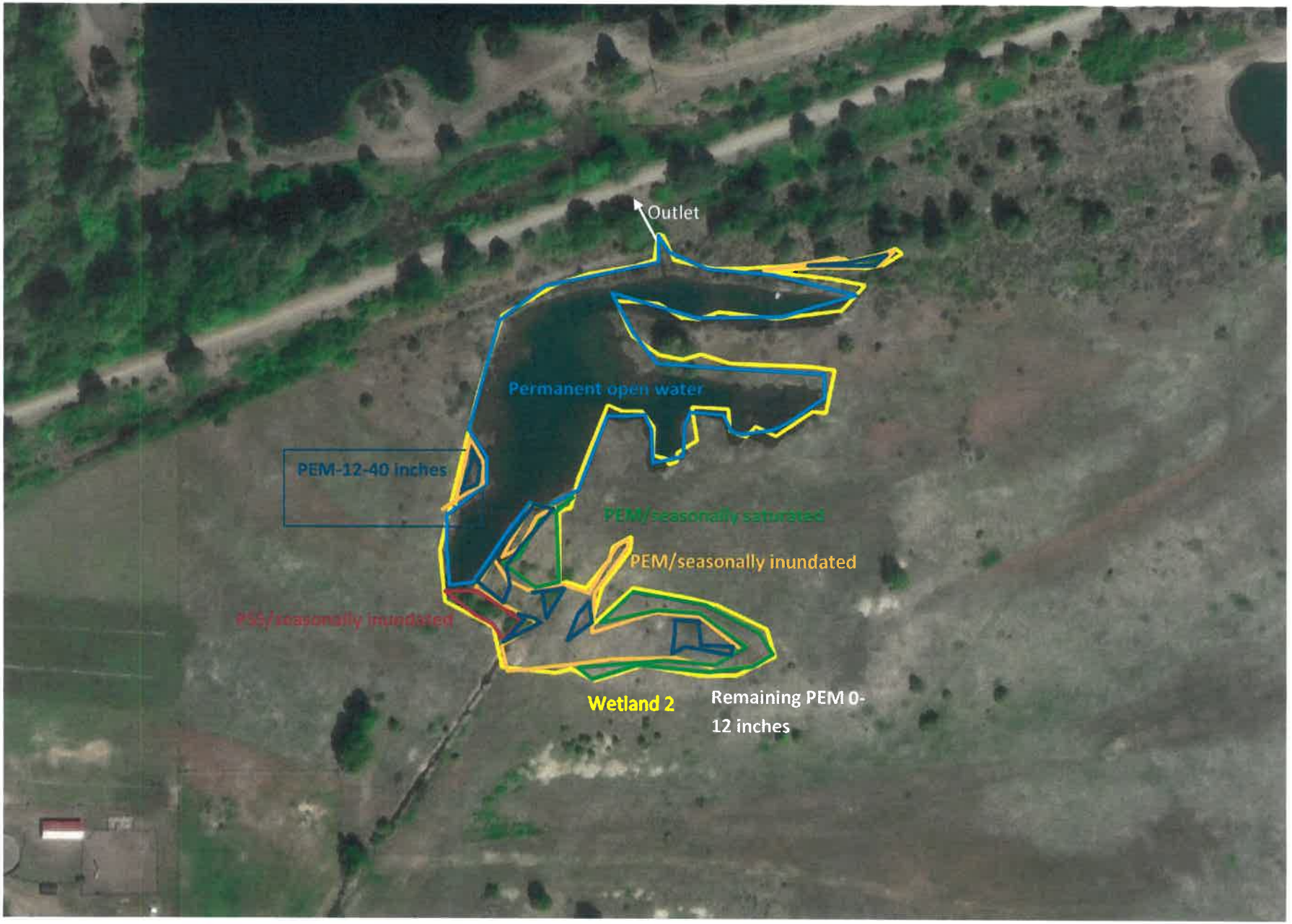


Figure 1. Wetland 2: Cowardin, hydroperiod, outlet.

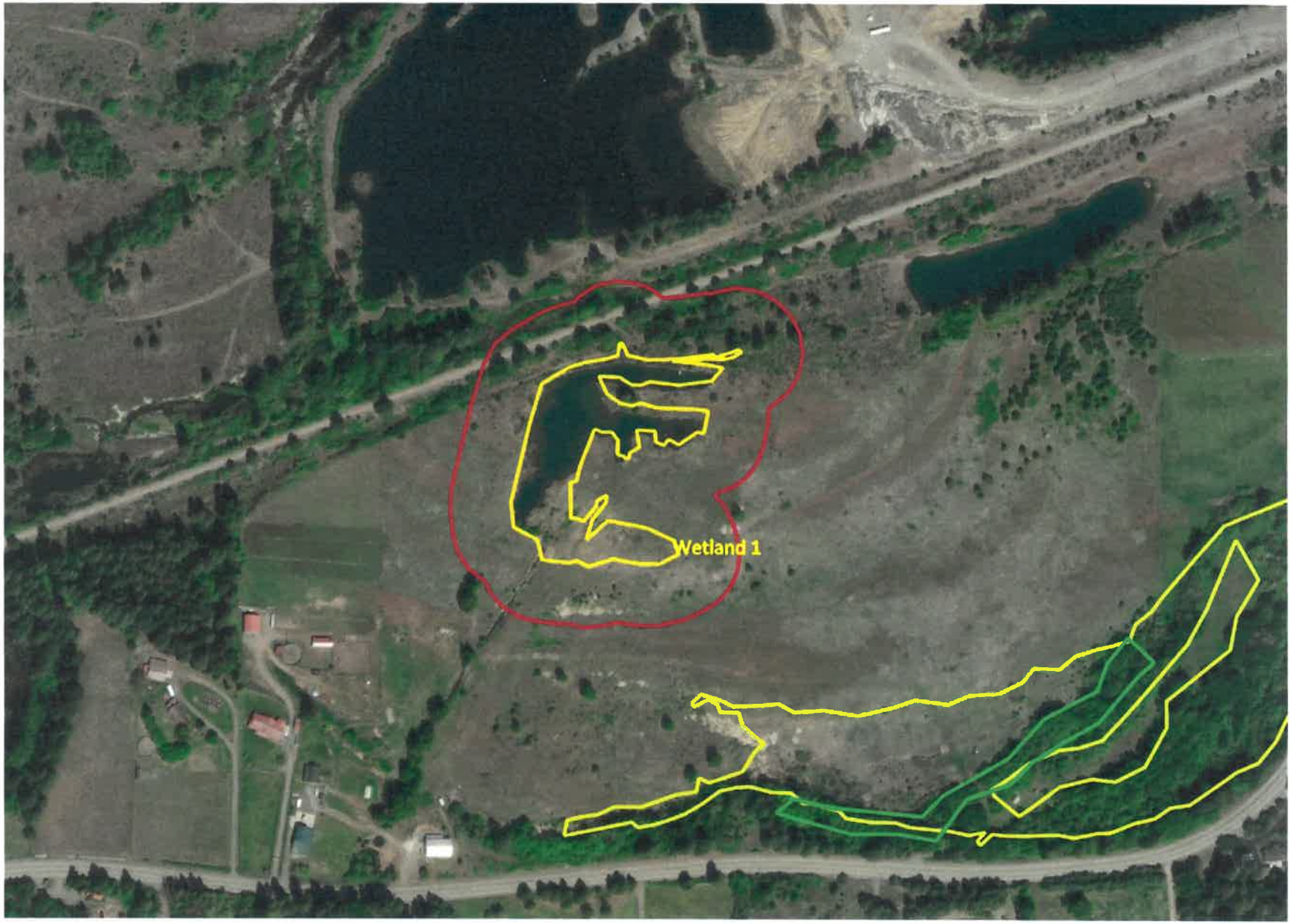


Figure 2. Wetland 2 150-foot buffer (in red).

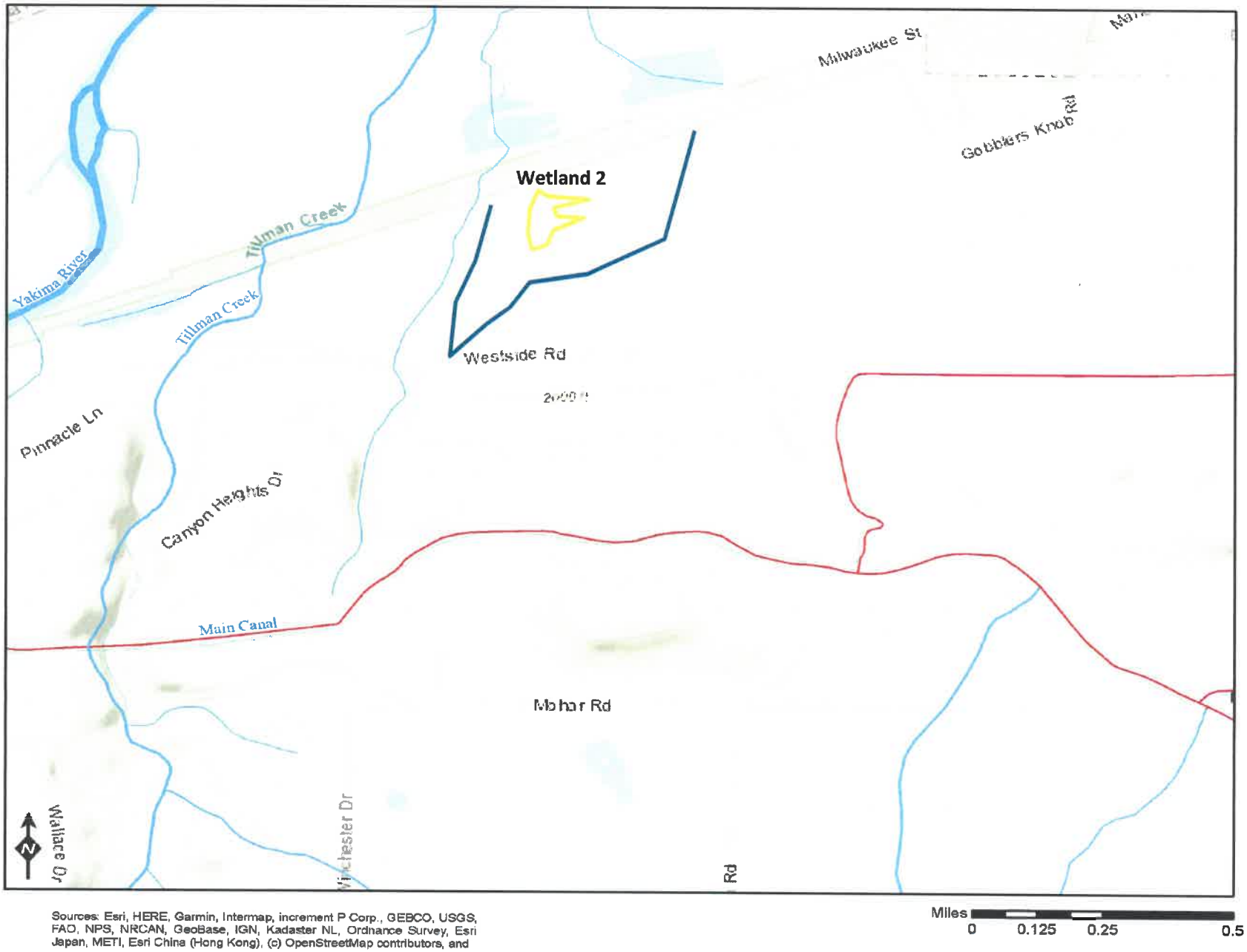


Figure 3. Wetland 2 estimated Contributing Basin (in blue).

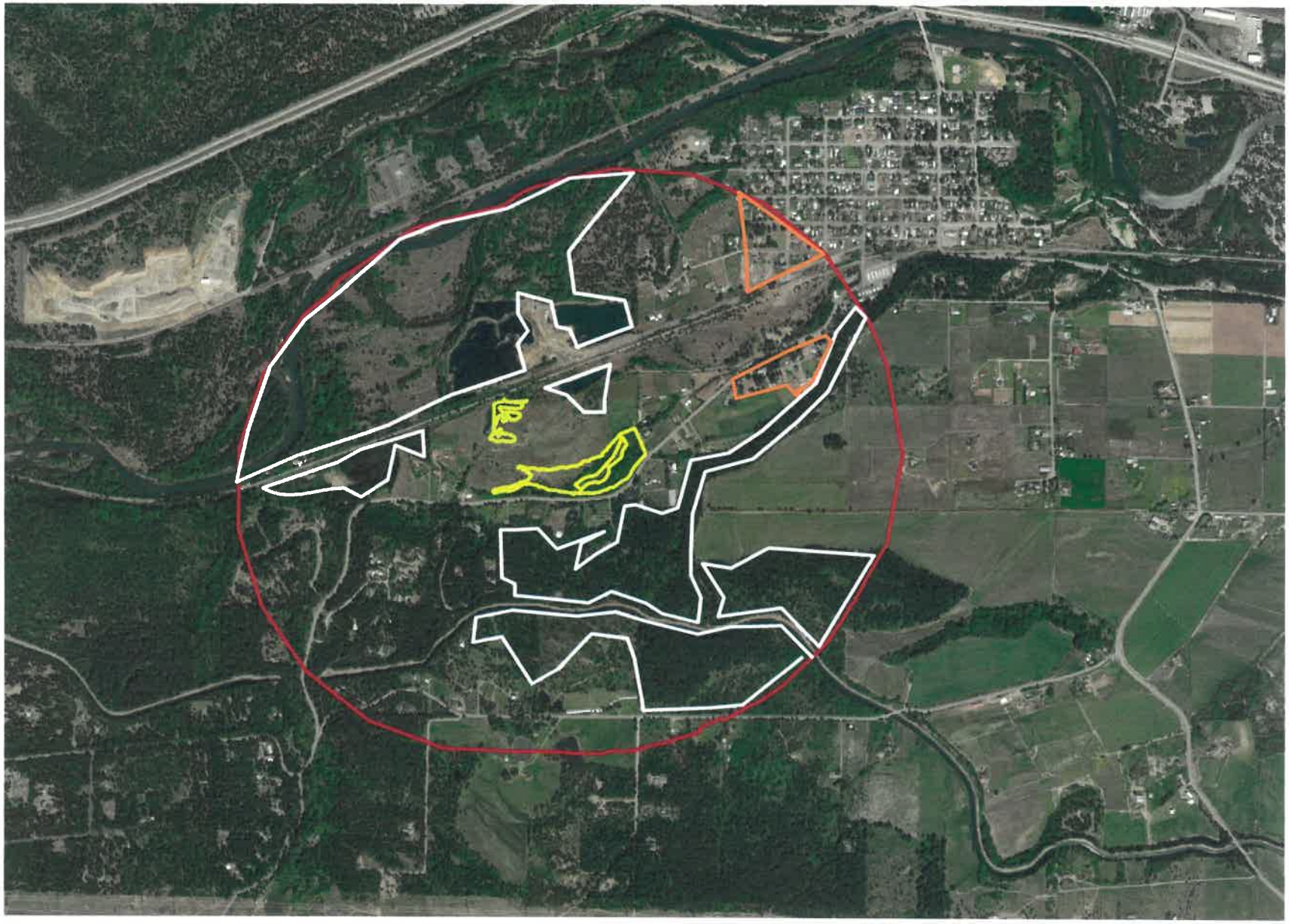


Figure 4. 1 KM buffer around Wetland 2. Relatively undisturbed areas (in white). High intensity (high intensity agriculture in orange). Remaining land use in low/moderate use (less than 1 residence/acre, forestry).

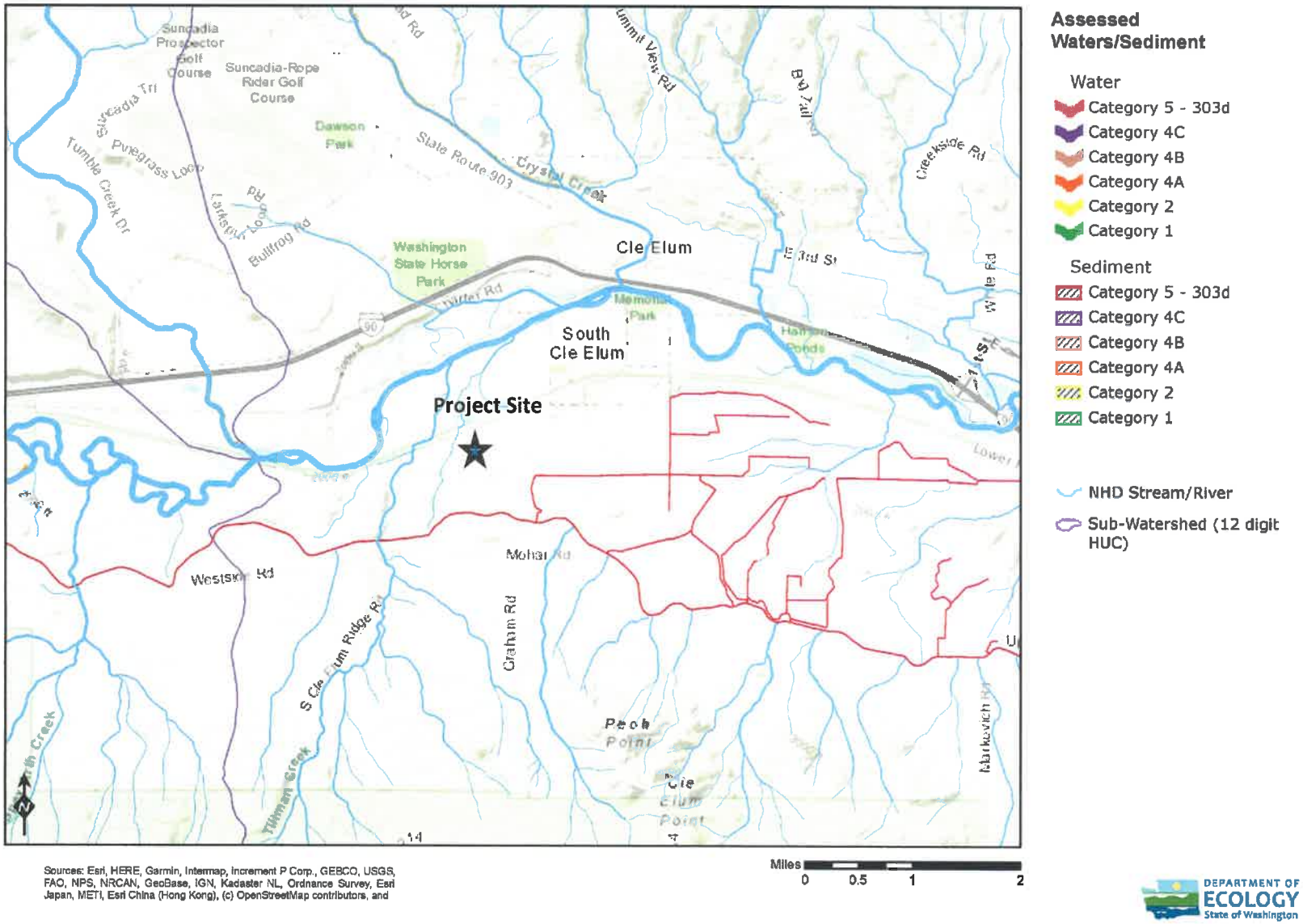


Figure 5. Wetland features do not drain to waters with 303 (d) listing within 1 mile of project site.

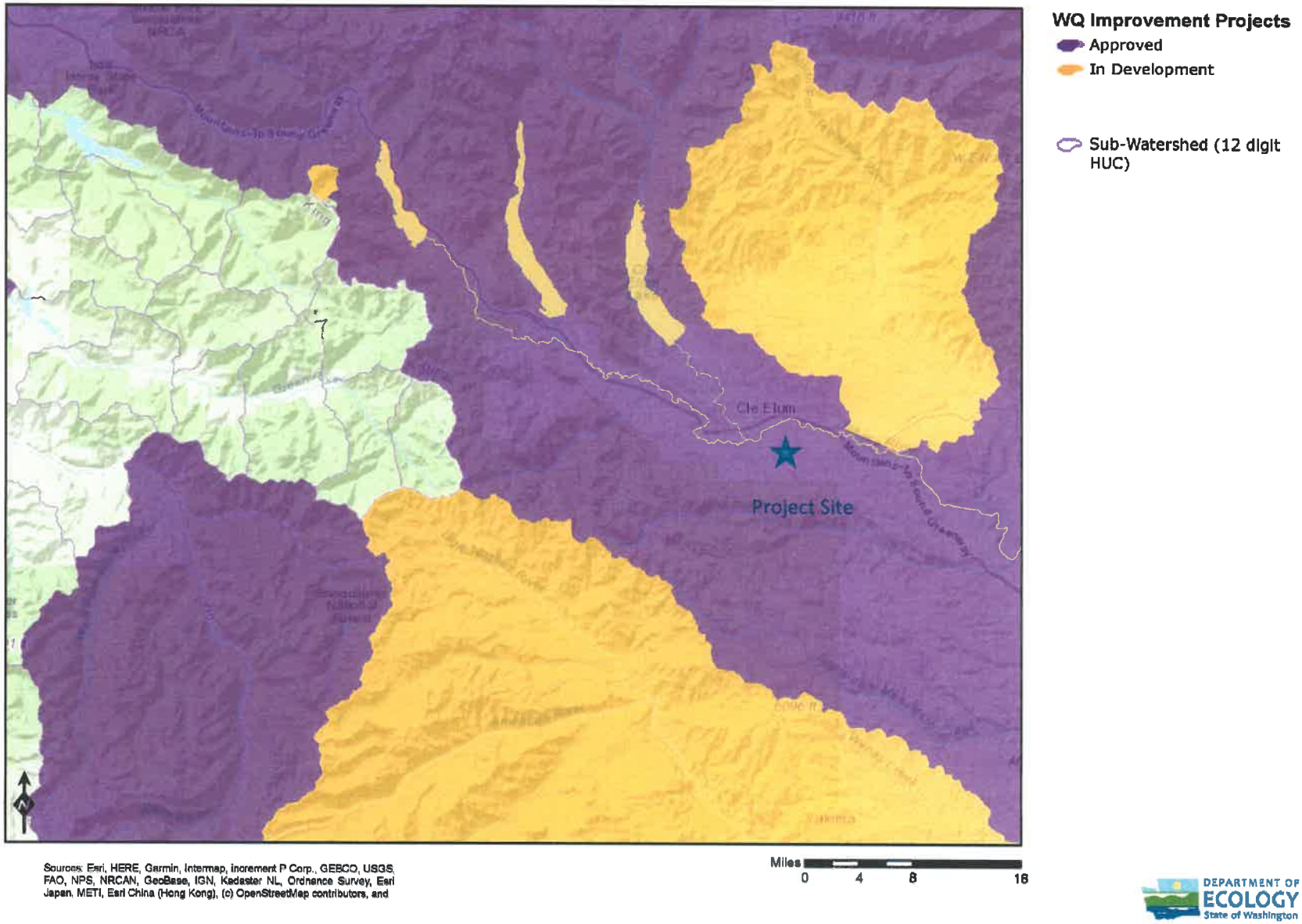
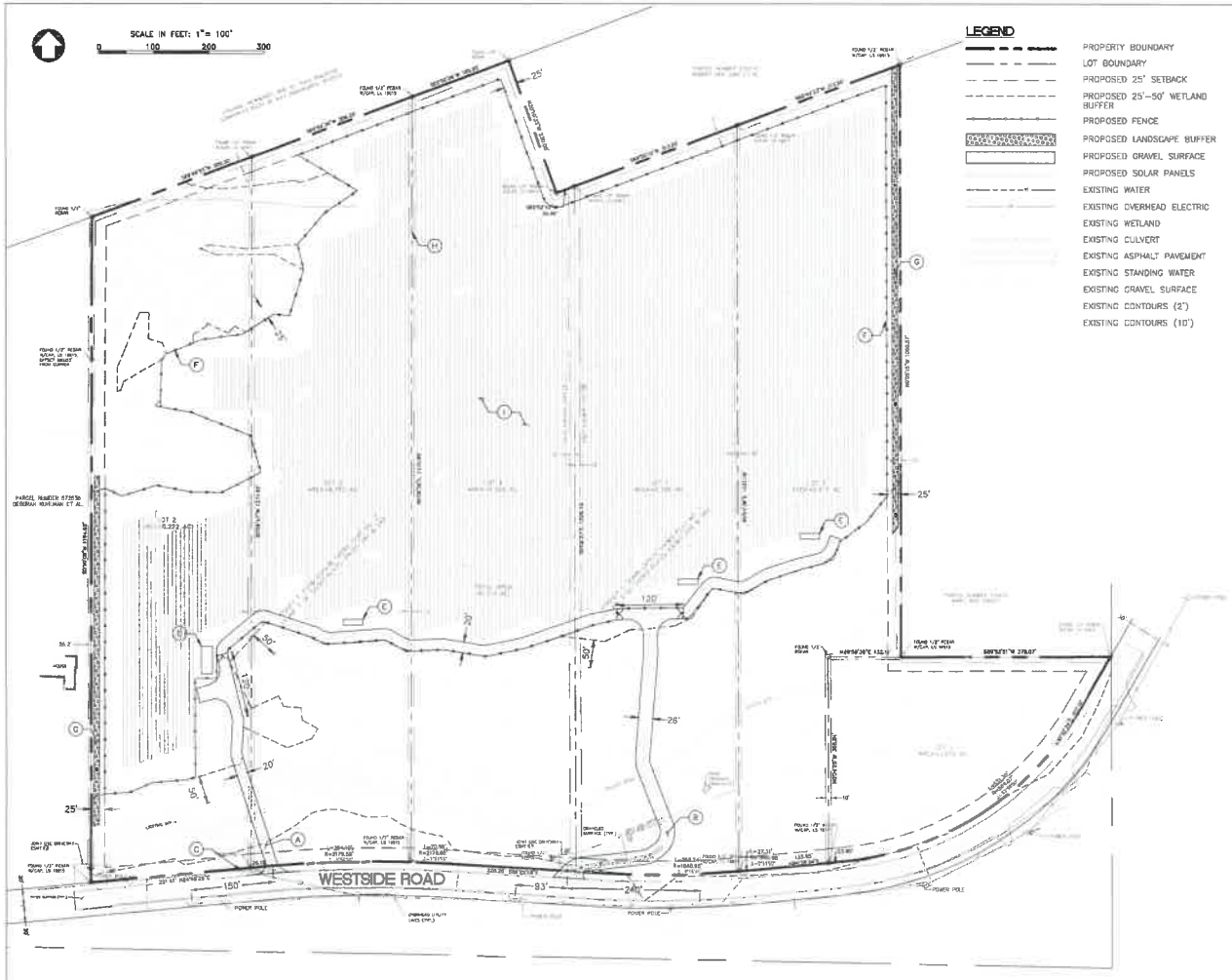


Figure 6. TMDL in Upper Yakima River basin for pollutants and temperature.

Appendix D — Site Plan



LEGEND

- PROPERTY BOUNDARY
- LOT BOUNDARY
- PROPOSED 25' SETBACK
- PROPOSED 25'–50' WETLAND BUFFER
- PROPOSED FENCE
- PROPOSED LANDSCAPE BUFFER
- PROPOSED GRAVEL SURFACE
- PROPOSED SOLAR PANELS
- EXISTING WATER
- EXISTING OVERHEAD ELECTRIC
- EXISTING WETLAND
- EXISTING CULVERT
- EXISTING ASPHALT PAVEMENT
- EXISTING STANDING WATER
- EXISTING GRAVEL SURFACE
- EXISTING CONTOURS (2')
- EXISTING CONTOURS (10')

KEY NOTES

(A) DRIVEWAY OPTION A – 347 FT LONG, 20 FT WIDE DRIVEWAY W/ CRUSHED GRAVEL SURFACING AND 120' HAMMERHEAD ALTERNATIVE PER 2015 IFC SECTION D103 (SEE DETAIL 2.) SIGNAGE WILL BE PLACED ON BOTH SIDES OF DRIVEWAY PER 2015 IFC SECTION D103. ACCESS GATE WILL BE LOCKED AND A KNOX-BOX PROVIDED PER KITTITAS COUNTY FIRE MARSHALL REQUIREMENTS. FINAL DRIVEWAY DESIGN WILL COMPLY WITH KCC 12.05.080. DRIVEWAY OPTION A TOTAL SURFACE AREA IS 10,005 S.F. WITH APPROX. 95' S.F. IMPACT TO WETLAND 1; PROPOSED GRADING IS NOT DEPICTED AND WILL BE BASED ON GEOTECHNICAL ENGINEERING REQUIREMENTS AND WETLAND PERMITTING CONSULTATION WITH USACE AND ECOLOGY. SEE GENERAL NOTE 9 ON COVER SHEET FOR ADDITIONAL INFORMATION.

(B) DRIVEWAY OPTION B – 625 FT LONG, 26 FT WIDE DRIVEWAY W/ CRUSHED GRAVEL SURFACING AND 120' HAMMERHEAD PER 2015 IFC SECTION D103 (SEE DETAIL 1.) SIGNAGE WILL BE PLACED ON BOTH SIDES OF DRIVEWAY PER 2015 IFC SECTION D103. ACCESS GATE WILL BE LOCKED AND A KNOX-BOX PROVIDED PER KITTITAS COUNTY FIRE MARSHALL REQUIREMENTS. FINAL DRIVEWAY DESIGN WILL COMPLY WITH KCC 12.05.080. DRIVEWAY OPTION A TOTAL SURFACE AREA IS 18,885 S.F. WITH APPROX. 9,343 S.F. IMPACT TO WETLAND 1. PROPOSED GRADING IS NOT DEPICTED AND WILL BE BASED ON GEOTECHNICAL ENGINEERING REQUIREMENTS AND WETLAND PERMITTING CONSULTATION WITH USACE AND ECOLOGY. SEE GENERAL NOTE 9 ON COVER SHEET FOR ADDITIONAL INFORMATION.

(C) POINT OF INTERCONNECTION TO PUGET SOUND ENERGY GRID VIA EXISTING OVER HEAD POWER LINES. CABLING TO EXISTING POLE FROM ON-SITE INTERCONNECTION EQUIPMENT WILL BE CONSTRUCTED UNDERGROUND VIA TRENCHLESS CONSTRUCTION IN THE AREA OF WETLAND 1.

(D) 20' x 50' INTERCONNECTION EQUIPMENT PAD

(E) 10' x 30' INVERTER PAD

(F) 8' TALL WOVEN-WIRE SECURITY FENCE PER DETAIL 4

(G) 25' LANDSCAPE BUFFER PLANTING AREA PER DETAIL 5

(H) INTERNAL LOT LINES AND ASSOCIATED EASEMENTS TO BE REMOVED BY RECOMBINATION PLAT PRIOR TO ISSUANCE OF BUILDING PERMIT.

(I) SOLAR ARRAYS MOUNTED ON SINGLE AXIS RACKING SYSTEM PER DETAIL 3

EXISTING CONDITIONS

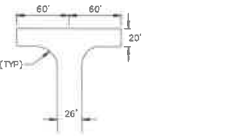
	AREA (SF)	AREA (AC)	% OF TOTAL
DRIVEWAY	1,589	0.04	0.1%
IMPERVIOUS TOTAL	1,589	0.04	0.1%
WETLAND	485,285	10.68	23.1%
VEGETATED AREA	1,546,189	35.50	76.8%
PERVIOUS TOTAL	2,011,474	46.18	99.9%
SITE TOTAL	2,013,072	46.21	100%

PROPOSED CONDITIONS - DRIVEWAY OPTION A

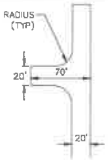
	AREA (SF)	AREA (AC)	% OF TOTAL
GRAVEL DRIVEWAY	33,877	0.78	1.7%
PILE FOUNDATIONS & EQUIPMENT PADS	10,904	0.25	0.5%
IMPERVIOUS TOTAL	44,850	1.03	2.2%
WETLAND	464,334	10.66	23.1%
VEGETATED AREA	1,503,957	34.52	74.7%
PERVIOUS TOTAL	1,968,291	45.18	97.8%
SITE TOTAL	2,013,072	46.21	100%

PROPOSED CONDITIONS - DRIVEWAY OPTION B

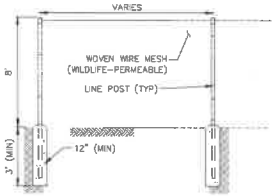
	AREA (SF)	AREA (AC)	% OF TOTAL
GRAVEL ROADWAY	40,231	0.92	2.0%
PILE FOUNDATIONS & EQUIPMENT PADS	10,904	0.25	0.5%
IMPERVIOUS TOTAL	51,135	1.18	2.5%
WETLAND	455,747	10.46	22.6%
VEGETATED AREA	1,506,190	34.58	74.8%
PERVIOUS TOTAL	1,961,937	45.04	97.5%
SITE TOTAL	2,013,072	46.21	100%



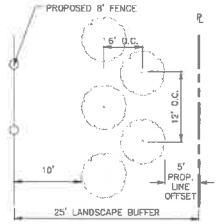
120-FT HAMMERHEAD TURNAROUND (1)
N.T.S.



120-FT HAMMERHEAD ALTERNATIVE (2)
N.T.S.

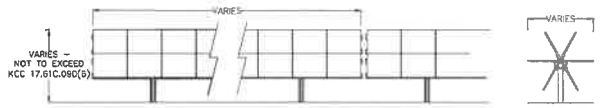


8-FT TALL WILDLIFE-PERMEABLE FENCE (4)
N.T.S.



NOTES:
1. PLANTING AREA WILL BE 25' WIDE.
2. SHOULD REPLACEMENT OF INDIVIDUAL PLANTINGS BE NEEDED, ALL EFFORTS WILL BE MADE TO MATCH EXISTING TREE HEIGHT, UP TO 7'. REPLANTING WILL OCCUR DURING THE FOLLOWING MONTHS: FEB-MAY OR SEPT-NOV.

LANDSCAPE BUFFER (5)
N.T.S.



TYPICAL RACK FRONT ELEVATION

TYPICAL RACK SIDE ELEVATION

NOTE: EXACT DIMENSIONS WILL VARY ACCORDING TO FINAL SITE DESIGN.

SINGLE-AXIS SOLAR ARRAY (3)
N.T.S.

HEELSTONE RENEWABLE ENERGY

Ecology and environment, Inc.
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CHECKED BY: T. CAMPBELL
DRAWN BY: C. BILLOR
APPROVED BY: T. CAMPBELL

WESTSIDE SOLAR PROJECT
WESTSIDE ROAD – KITTITAS COUNTY, WA

SITE PLAN

C100

PROJECT	SCALE	DWG. FILE NO.	DATE ISSUED
1009551.001.RS	AS NOTED	WSS_C100	10/16/19 CONDITIONAL USE