Appendix K: Urtica Solar Project Site Reports and Permit Applications

K-1: Urtica Solar Project Critical Areas Report

K-2: Urtica Solar Project Cultural Resources Report

K-3: Urtica Solar Project Permit Applications

K-4: Urtica Solar Project Geotechnical Engineering Study

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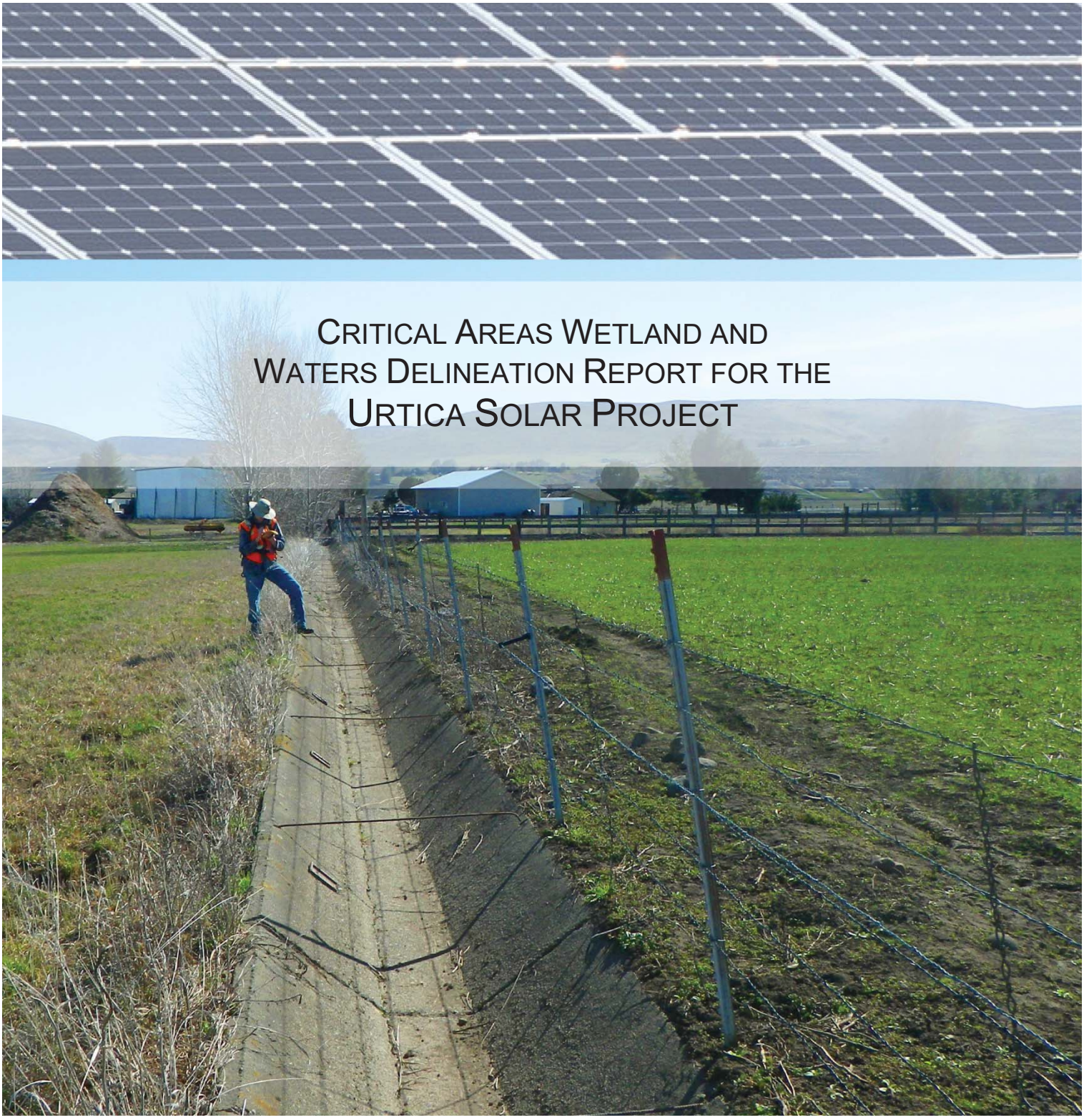
Appendix K-1: Urtica Solar Project Critical Areas Report



CRITICAL AREAS WETLAND AND WATERS DELINEATION REPORT FOR THE URTICA SOLAR PROJECT

July 10, 2017

SWCA ENVIRONMENTAL CONSULTANTS
SEATTLE, WASHINGTON

CRITICAL AREAS WETLAND AND WATERS DELINEATION REPORT FOR THE URTICA SOLAR PROJECT KITTITAS COUNTY, WASHINGTON

Section 10, Township 17 North, Range 18 East
Parcel Numbers 808533, 869436, 879436, 889436, 950243, 950244, 950245, 950246, 950247, and 950248

Report Prepared for

TUUSSO Energy, LLC

By
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July 10, 2017

Project Number 38727.05

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1 INTRODUCTION

This report describes the methods and findings of wetland, stream, and other critical areas delineation for the proposed Urtica Solar Project. The report was prepared by SWCA Environmental Consultants (SWCA), and is intended to address permitting requirements under Energy Facility Site Evaluation Council (EFSEC) Washington Administrative Code (WAC) 463-60-322, -332, and -333, and to show compliance of the proposed project with Kittitas County's Code for Critical Areas Ordinance (KCC Chapter 17A).

1.1 Background

TUUSSO Energy, LLC (TUUSSO), is proposing to construct a new photovoltaic solar facility installation on approximately 51.1 acres of private agricultural land, which would connect into the existing Puget Sound Energy (PSE) distribution transmission line along Umptanum Road, located southwest of Ellensburg, Kittitas County, Washington. The Urtica Solar Project is intended to provide up to 5 MW of solar energy to PSE for use within their service area.

1.2 Project Setting

The Urtica Solar Project site primarily consists of active agricultural land located on the west side of Umptanum Road and approximately 0.2 mile southwest of the Yakima River, with McCarl Creek flowing through the study area from west to east, southwest of Ellensburg in unincorporated Kittitas County, Washington. The project would be located approximately 0.2 mile north of the intersection of Umptanum Road and Manastash Road, in Section 10 of Township 17 North, Range 18 East, Willamette Meridian (Figure 1). The project site totals approximately 51.1 acres. Topography of the site generally slopes to the east toward Umptanum Road and toward McCarl Creek, which flows through the study area. Surface elevation within the study area ranges from 1,539 to 1,575 feet above mean sea level, the lowest elevation being within the eastern portion of the McCarl Creek channel along Umptanum Road and the highest elevation being along the western site boundary.

2 METHODS

2.1 Study Area

The Urtica Solar Project site is approximately 51.1 acres in size (Figure 1). Wetlands and streams outside of the project site but that occur within 200 feet of the project site boundary and had the potential to have buffers extend into the project site were included in the study area. Wetlands and streams outside of the project site and within the study area were visually inspected but not formally delineated.

2.2 Review of Existing Information

Prior to conducting fieldwork, background materials were reviewed to determine the potential for wetlands, floodplains, habitats, and other critical areas and their buffers that may occur within the study area. Materials referenced during the desktop study are listed below. The following checklist follows the KCC Critical Areas required checklist outlined in KCC Chapter 17A.03.035.

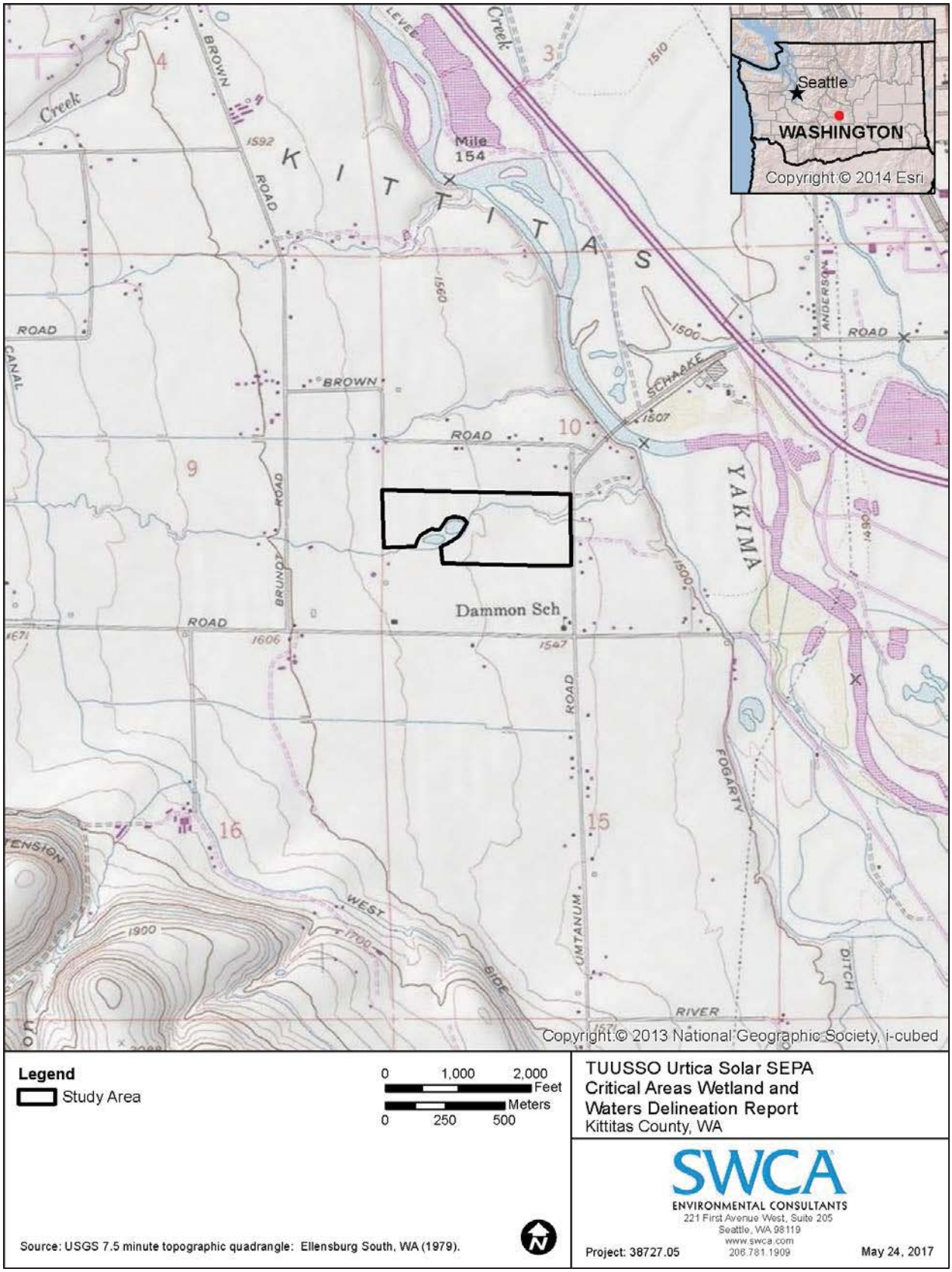


Figure 1. Project vicinity map.

Wetlands (KCC Chapter 17A.04)

- Historical Google Earth aerial photography (2000–2016).
- U.S. Department of Agriculture (USDA) historical imagery (USDA 1954).
- U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle map for Ellensburg South, Washington, included in Figure 1.
- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) data and USGS National Hydrography Dataset (NHD), included in Figure 2.
- Natural Resources Conversation Service (NRCS) Soil Survey of Kittitas County Area, Washington and NRCS Web Soil Survey map of the study area, included in Figure 3.

Frequently flooded areas (KCC Chapter 17A.05)

- Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Panel 5300950552C (as cited by Kittitas County 2017 and modified by Encompass Engineering & Surveying), included in Figure 2.

Geologically hazardous areas (KCC Chapter 17A.06)

- Includes erosion, landslide, mine, and seismic hazard areas.
- Kittitas County COMPAS mapping tool.

Habitats (KCC Chapter 17A.07)

- Includes riparian habitats and streams and rivers.
- Washington State Department of Fish and Wildlife (WDFW) SalmonScape online mapper.
- WDFW Priority Habitats and Species (PHS) online mapper, included in Figure 3.

Aquifer recharge areas (KCC Chapter 17A.08)

- No critical aquifer recharge locations have been identified in Kittitas County.

Spatial data obtained during the review of existing information were incorporated into the Urtica Solar Project base maps (Figures 1–3).

2.3 Field Investigation

Following the desktop review of existing information, a team of two biologists conducted site visits on April 6 and 7, 2017, to assess the study area for the presence of wetland and waterbody features and to record data relevant to the Washington State Department of Ecology's (Ecology's) most recently approved version of the *Washington State Wetland Rating System for Eastern Washington, 2014 Update* (Hruby 2014). Visual observations were recorded within 200 feet of the project site, and included wildlife and habitat data.

Precipitation data were obtained from the closest wetlands climate analysis (WETS) climate station, the Ellensburg National Weather Service (NWS) station (ELBW1), approximately 1.5 miles to the east of the project site in southern Ellensburg, Washington. Historical (1971–2000) average annual rainfall is listed as 8.96 inches. Table 1 shows the monthly precipitation at the Ellensburg NWS weather station for the 3 months prior to the April 6 and 7, 2017, site visits. Table 2 shows the rainfall received 2 weeks prior to the site visits, and the water-year-to-date (WYTD) rainfall. Rainfall recorded 3 months prior to fieldwork was wetter than normal.

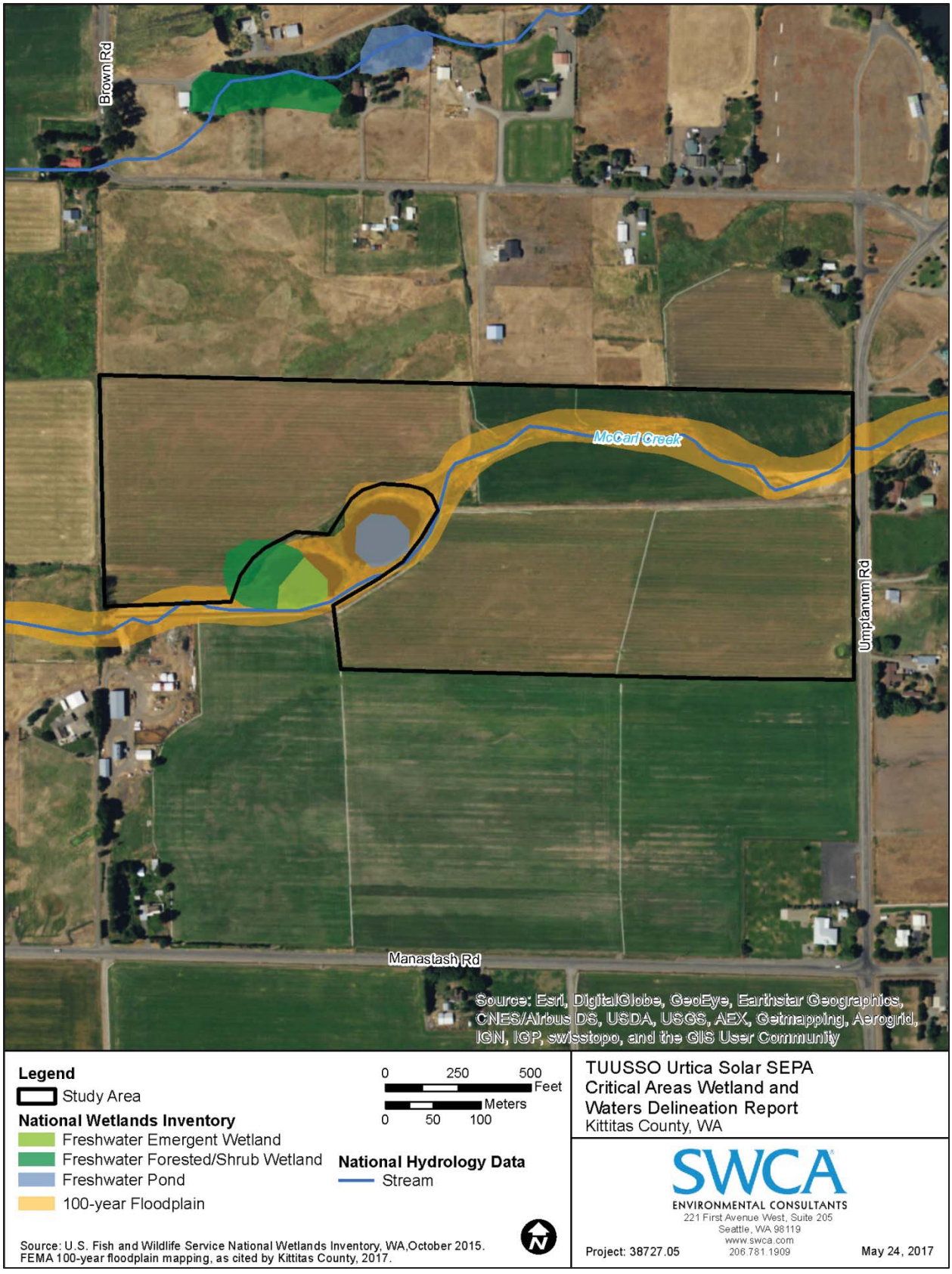


Figure 2. NWI, NHD, and floodplain mapping.

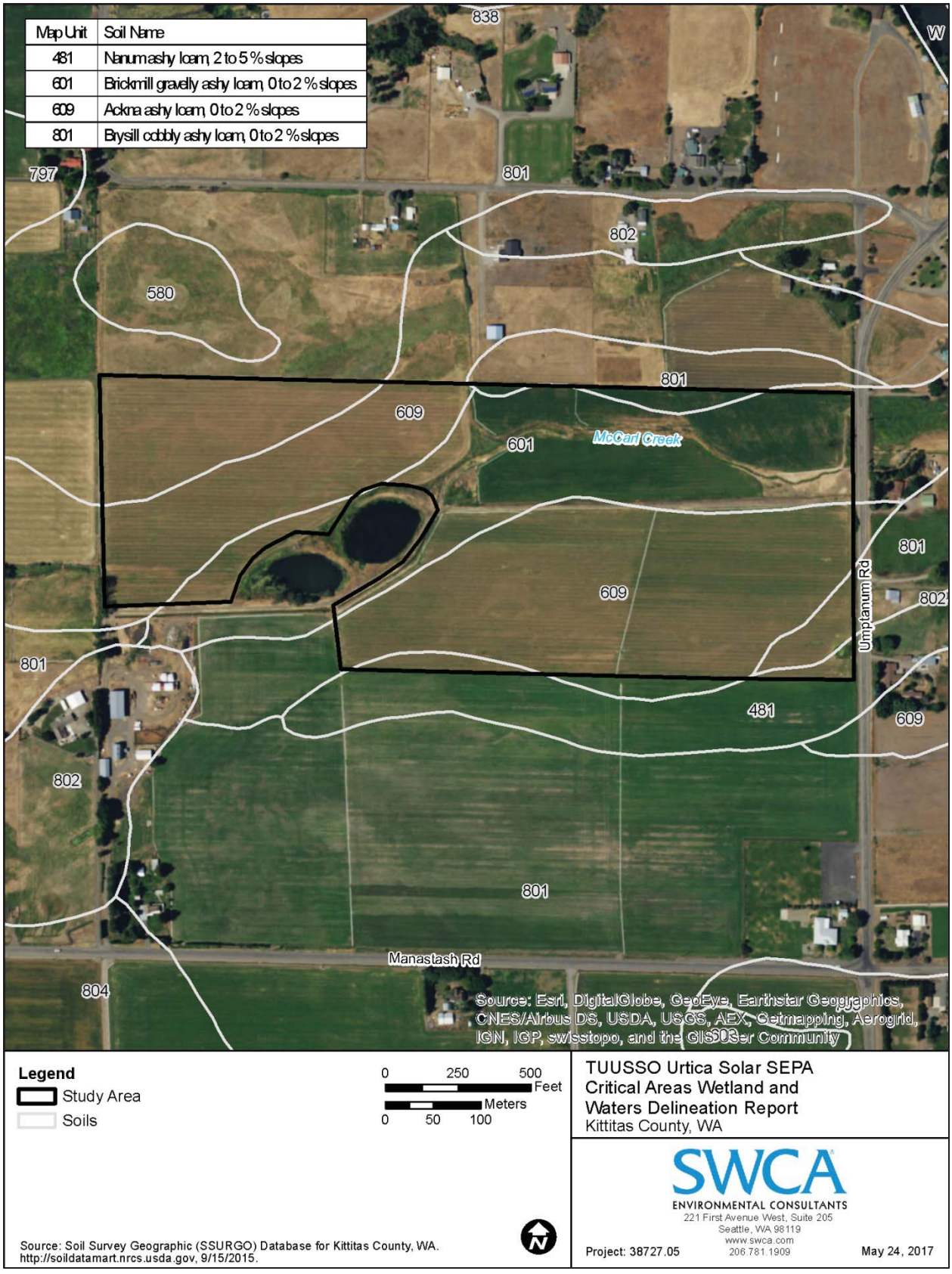


Figure 3. Soils and PHS mapping.

Table 1. Precipitation for 3 Months Prior to Site Visits (in inches)

Month	Average	30% Chance Will Have		Observed Precipitation	Within Normal Range?
		Less Than	More Than		
March	0.76	0.36	0.93	1.49	Above
February	0.91	0.59	1.10	2.04	Above
January	1.19	0.65	1.45	1.54	Above

Source: NRCS 2017b.

Table 2. Precipitation 2 Weeks Prior to Site Visits (in inches)

Field Study	Precipitation 2 Weeks Prior	WYTD	Inches Above or Below Normal WYTD*
April 5–March 23, 2017	0.48	8.93	2.74 above
April 6–March 24, 2017	0.60	9.06	3.85 above

*Based on average precipitation from 1981 to 2010.
Source: NRCS 2017b.

2.3.1 Wetlands

The study area was investigated for wetlands in accordance with the current methodology of the U.S. Army Corps of Engineers' (USACE's) 2008 *Arid West Regional Supplement (Version 2)* and the *Wetlands Delineation Manual* (Environmental Laboratory 1987). A detailed description of the field methods used in this study is provided in Appendix A.

A Trimble Geo XT global positioning system (GPS) unit was used by the field team to assist in identifying the project site boundaries and to record site spatial data. This device is capable of submeter accuracy. The full extent of the study area was covered by the team of biologists. Photographs were collected and vegetation, soil, and hydrology characteristics were documented. The boundaries for wetlands located outside of the project site but within the study area were approximated using field observations and aerial imagery to determine the extent of on-site wetland buffers.

Geographic information system (GIS) software were used to analyze data and to produce the report figures (Figures 4 and 5). Per WAC 463-60-333 and KCC Chapter 17A, wetlands were rated using the *Washington State Wetland Rating System for Eastern Washington, 2014 Update*. Per KCC 17A.04.020, the resulting wetland ratings were used to determine the County-prescribed range of wetland buffers for each wetland. Table 3 lists Ecology's wetland rating criteria. Kittitas County's definition of a wetland is based on the Revised Code of Washington (RCW) 36.70A.030, which states:

> *(21) "Wetland" or "wetlands" means areas that are inundated or saturated by surface water or groundwater 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. Wetlands generally include swamps, marshes, bogs, and similar areas. Wetlands do not include those artificial wetlands intentionally created from nonwetland sites, including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street, or highway. Wetlands may include those artificial wetlands intentionally created from nonwetland areas created to mitigate conversion of wetlands.*

Table 3. Washington State Department of Ecology Wetland Rating System

Category			
I	**II**	**III**	**IV**
Category I wetlands: Represent a unique or rare wetland type; are more sensitive to disturbance than most wetlands; are relatively undisturbed and contain ecological attributes that are impossible to replace within a human lifetime; or provide a high level of functions. Specific wetlands that meet the Category I criteria include: 1. alkali wetlands, characterized by the presence of shallow saline water with a high pH; 2. natural heritage wetlands, specifically, wetlands identified by the Washington Natural Heritage Program/DNR as high quality relatively undisturbed wetlands; and wetlands that support state-listed threatened or endangered plants; 3. bogs and calcareous fens; 4. mature and old-growth forested wetlands with slow growing trees that are over 0.25 acre in size; and 5. wetlands that perform many functions very well, as indicated by a score of 22 or more points out of 27 on the wetland rating form.	Category II wetlands: Wetlands that are difficult, though not impossible, to replace, and provide high levels of some functions. Specific wetlands that meet the Category II criteria include: 1. forested wetlands in the floodplains of rivers; 2. mature and old-growth forested wetlands with fast growing trees that are over 0.25 acre in size; 3. vernal pool that are located in a landscape with other wetlands and that are relatively undisturbed during the early spring; and 4. wetlands scoring between 19 and 21 points, out of 27, on the wetland rating form.	Category III wetlands: Wetlands that provide a moderate level of functions. Specific wetlands that meet the Category III criteria include: 1. wetlands scoring between 16 and 18 points, out of 27, on the wetland rating form.	Category IV wetlands: Wetlands that have the lowest levels of functions and are heavily disturbed. Specific wetlands that meet the Category IV criteria include: 1. wetlands scoring less than 16 points out of 27 on the wetland rating form.

Source: Hruby (2014).
Kittitas County wetland category definitions defer to Washington Administrative Code for guidance.
Appendix F includes the County-issued guidance.

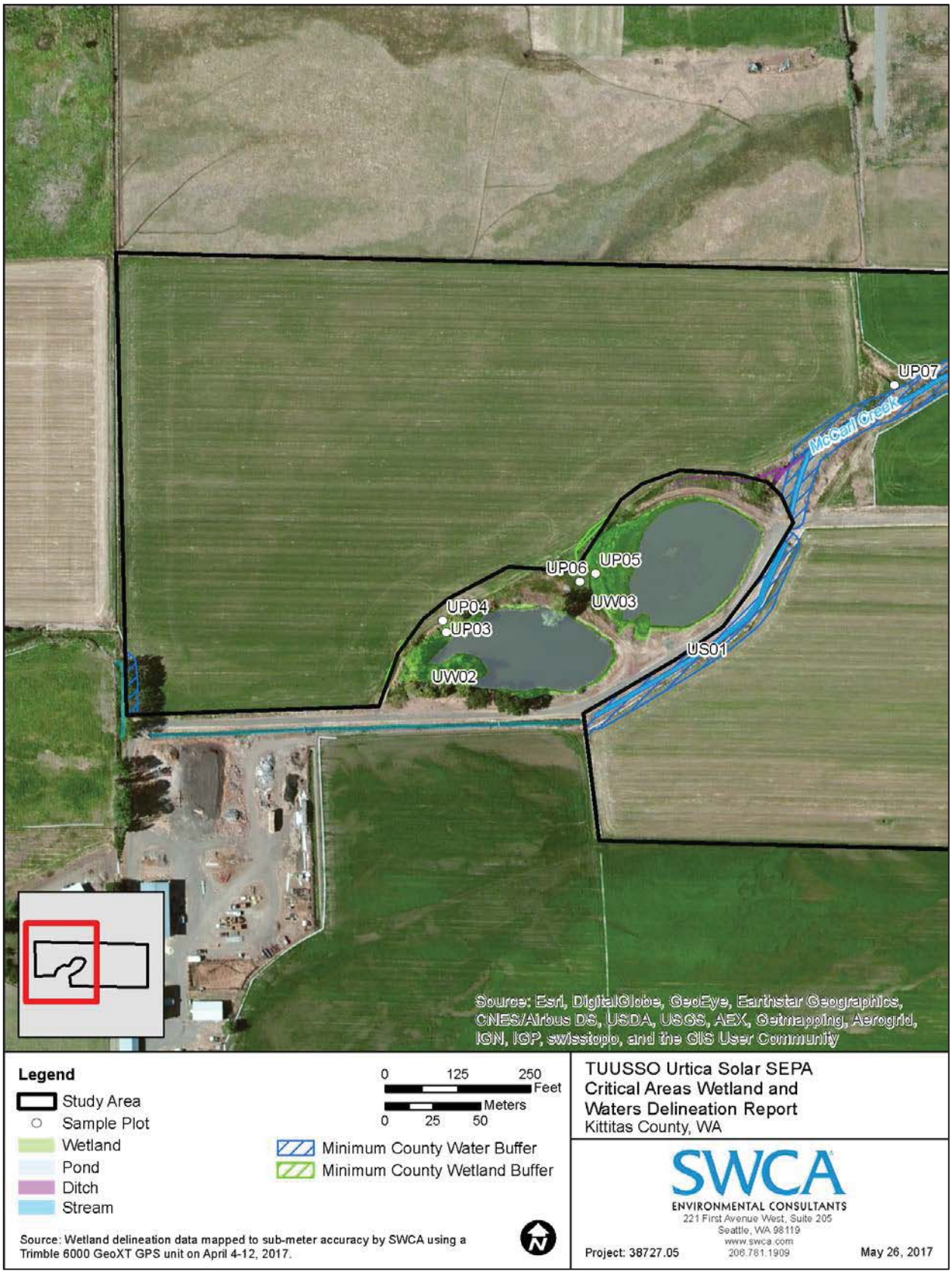


Figure 4. Wetland and waters delineation map, west portion.

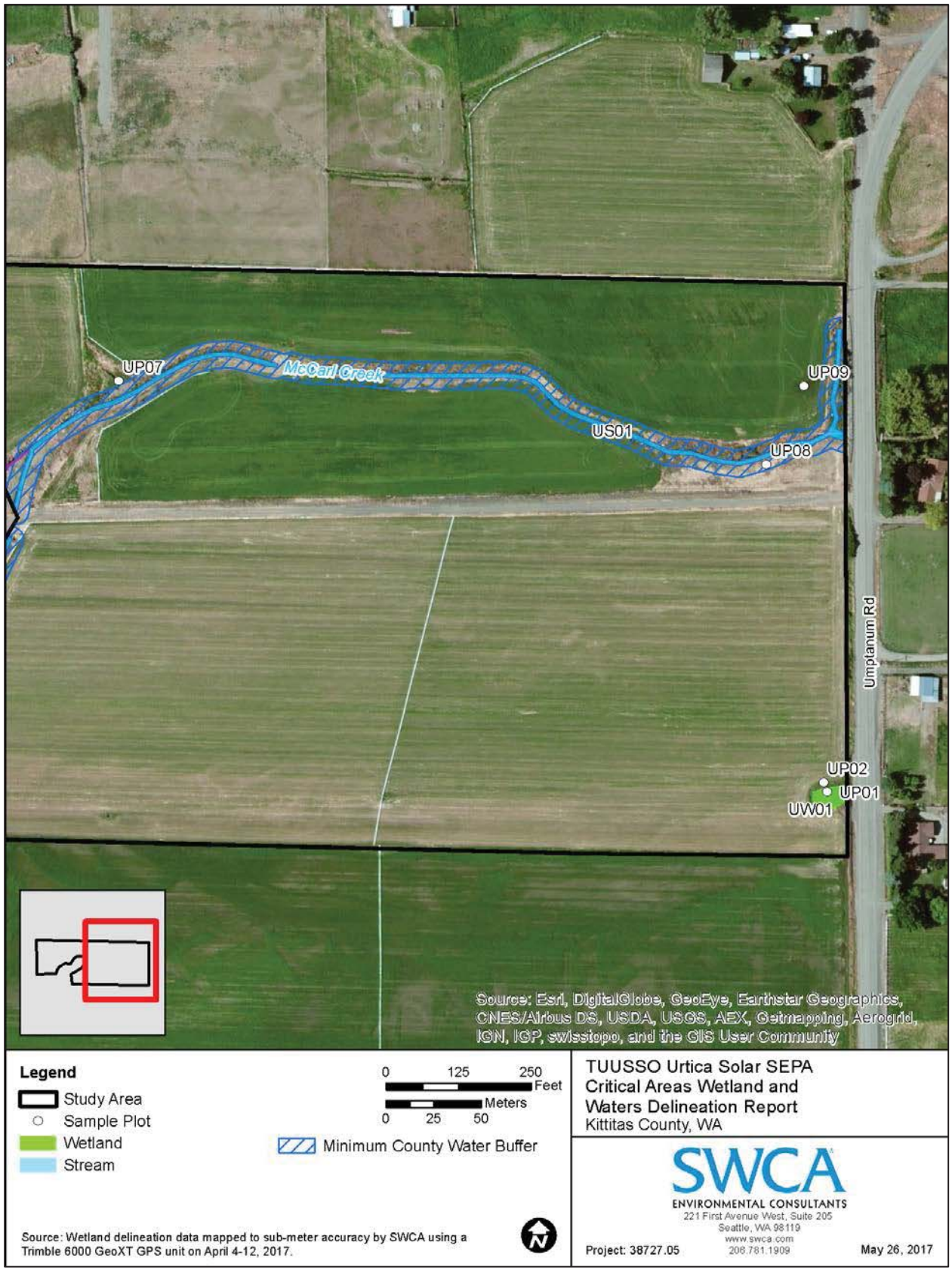


Figure 5. Wetland and waters delineation map, east portion.

A detailed analysis of wetland functions is not included in this report; however, a brief description of wetland functions is provided as part of the general description for each wetland.

2.3.2 Riparian Habitats

Biologists also investigated the study area for the presence of waterbodies and used a GPS device to delineate the ordinary high water marks (OHWMs) of streams per the definitions in WAC 173-22-030 (Figure 5). The OHWMs of streams and rivers outside of the project site but within the study area were approximated using field observations and aerial imagery to determine the extent of on-site stream buffers.

Streams identified in the study areas were classified according to the WAC stream typing system (WAC 222-16-030). Criteria for this typing system are described in Table 4. The stream types described in this report are based on the stream reaches within the study area; downstream reaches may be rated higher.

Table 4. Summary of the Water Typing System

Stream Type	Definition [a]
S	All waters, within their bankfull width, as inventoried as "shorelines of the state" under Chapter 90.58 RCW and the rules promulgated pursuant to Chapter 90.58 RCW including periodically inundated areas of their associated wetlands.
F	All segments of natural waters that are not Type S waters, and that contain fish or fish habitat, including: 1) waters diverted for domestic use by more than 10 residential or camping units or by a public accommodation facility; 2) waters diverted for use by a federal, state, or Tribal fish hatchery from the point of diversion for 1,500 feet or the entire tributary if the tributary is highly significant for protection of downstream water quality; 3) waters that are within a federal, state, local, or private campground having more than 10 camping units; or 4) riverine ponds, wall-based channels, and other channel features that are used by fish for off-channel habitat.
Np	All segments of natural waters within the bankfull width of defined channels that are perennial non–fish habitat streams. Perennial streams are flowing waters that do not go dry any time of a year of normal rainfall and include the intermittent dry portions of the perennial channel below the uppermost point of perennial flow.
Ns	All segments of natural waters within the bankfull width of the defined channels that are not Type S, F, or Np waters. These are seasonal, non–fish habitat streams in which surface flow is not present for at least some portion of a year of normal rainfall and the stream is not located downstream from any stream reach that is a Type Np water. Ns waters must be physically connected by an above-ground channel system to Type S, F, or Np waters.

[a] Definitions are summarized from WAC 222-16-030. Kittitas County stream type definitions defer to WAC for guidance.

3 RESULTS AND DISCUSSION

The Urtica Solar Project site primarily consists of actively managed agriculture for growing common timothy (*Phleum pratense*) hay with a highly manipulated stream (formerly called McCarl Creek) that flows south of two ponds in the western portion of the site (outside of the project site) and through the northeastern quarter of the project site. In addition, a farm road bisects the project site, crossing the site from east to west and passing over McCarl Creek just east of the ponds. Some species of weeds and non-native herbaceous species occur around the edges of the agricultural land, along the sides of the farm road, and in the interspace between planted timothy, including tall false rye grass (*Schedonorus arundinaceus*), bluegrass (*Poa* spp.), creeping wild rye (*Elymus repens*), colonial bent grass (*Agrostis capillaris*), white clover (*Trifolium repens*), hairy cat's-ear (*Hypochaeris radicata*), and common dandelion (*Taraxacum officinale*). In addition, there are areas adjacent to McCarl Creek in the northeastern quarter of the project site that do not meet wetland criteria but are dominated by wetland species and could be partially influenced by McCarl Creek. These areas would be within the county-required minimum buffer of McCarl Creek and are dominated by reed canary grass (*Phalaris arundinacea*). Refer to Appendix B for a complete list of vegetation observed within the study area.

The proposed Urtica Solar Project site is situated between Umptanum Road and Brondt Road to the east and west and between Brown Road and Manastash Road to the north and south. The project site is approximately 0.2 mile from the Yakima River and is surrounded by active agricultural land and rural residences in all directions. Access to the proposed project is on the west side of Umptanum Road via the farm road that bisects the project site.

According to NRCS, the study area encompasses four different soil map units (Table 5). These soil map units range from somewhat poorly drained to well drained soils that occur on terraces, piedmont slopes, valleys, and alluvial fans. None of the soil units within the study area are on the National Hydric Soils list (NRCS 2015), which is a list of soils that can be indicative of saturated, flooded, or ponded areas that could meet the definition of a hydric soil.

Table 5. Soil Mapping within the Study Area

Map Unit Symbol	Map Unit Name	Hydric
481	Nanum ashy loam, 2% to 5% slopes	No
601	Brickmill gravelly ashy loam, 0% to 2% slopes	No
609	Ackna ashy loam, 0% to 2% slopes	No
801	Brysill cobbly ashy loam, 0% to 2% slopes	No

Source: NRCS 2015 and 2017b.

3.1 Wetlands

Only one wetland (UW01) was delineated within the study area, but two more wetlands (UW02 and UW03) were delineated outside of the study area that would have protection buffers that extend into the study area. Wetlands were distinguished from adjoining uplands by the presence or absence of indicators for wetland hydrology, hydric soils, and hydrophytic vegetation. Wetland delineation data sheets are provided in Appendix C, photographs are provided in Appendix D, and wetland rating forms are provided in Appendix E.

Table 6 summarizes the size, rating, and classification of wetlands found within and adjacent to the study area. All delineated wetlands would fall under the jurisdiction of the USACE, Ecology, and Kittitas County. Figures 4 and 5 show the locations of the wetlands, streams, data plots, and their associated minimum protection buffers. The minimum wetland protection buffers were calculated per KCC guidance based on Ecology's Wetland Rating for each wetland. Detailed descriptions of each wetland are provided in the following sections.

Table 6. Wetland Size, Rating, and Classification for Wetlands within the Study Area

Wetland Name	Delineated Area within Project Site (Wetland Rating Unit Size) [a] (acres)	Wetland Rating [b]	Hydrogeomorphic Classification	Cowardin Classification [c]	Dominant Species Observed within Wetland
UW01	0.05 (0.05)	III	Depressional	PEM	Reed canary grass, broad-leaf cat-tail, common duckweed
UW02	0.00 (0.97)	III	Depressional	PEM	Reed canary grass, curly dock, lamp rush, broad-leaf cat-tail
UW03	0.00 (1.19)	III	Depressional	PEM	Reed canary grass, broad-leaf cat-tail, colonial bent grass, curly dock, lamp rush

a Wetland rating unit size is the total area of wetland delineated or estimated based on aerial photograph interpretation and field reconnaissance. Area of delineated portions of the wetlands is based on SWCA survey data.

b Wetland ratings are based on *Washington State Wetland Rating System for Eastern Washington – Revised* (Hruby 2014).

c Cowardin et al. (1979).

3.1.1 Wetland UW01

Palustrine emergent
Category III
0.05 acre within the project site and in total

Wetland UW01 is a small depressional wetland located near the southeastern corner of the project site (see Figure 5; and wetland rating Figures 1 through 5 in Appendix E). Delineation data were recorded at sample plots UP01 and TP02, provided on datasheets in Appendix C. The wetland does not extend off-site and is fed by overflow from the roadside ditch along Umptanum Road and from overland flow from the adjacent uplands to the west. The upland boundary is defined by an obvious rise in elevation and change in the plant community in every direction.

Wetland UW01 is a palustrine emergent (PEM) wetland habitat type (Cowardin et al. 1979). Refer to Table A-1 in Appendix A for definitions of wetland indictor statuses listed in this section (i.e., FAC, FACW, and OBL). The wetland is dominated by reed canary grass (FACW) and broad-leaf cat-tail (*Typha latifolia*, OBL), except for about a quarter of the wetland that was sparsely vegetated from recent standing water with dead common duckweed (*Lemna minor*, OBL).

Soils in Wetland UW01 are mapped as Nanum ashy loam with 2% to 5% slopes and Brysill cobbly ashy loam with 0% to 2% slopes (NRCS 2017a) (see Figure 3). The typical soil profile observed within 16 inches of the soil surface consists of very dark grayish brown (10YR 3/2) silt loam with redoximorphic features starting at 2 inches, with a thin layer of sand at 2 inches, over a very dark gray (2.5Y 3/1) silt loam layer starting at 8 inches with more prominent redoximorphic features (Munsell Color 2009). The soils in Wetland UW01 meet the hydric soil indicator for Redox Dark Surface (F6).

Primary indicators of hydrology within the wetland include saturation from 0 to 8 inches from recent surface water ponding, surface soil cracks, inundation visible on aerial imagery, and aquatic invertebrates. The presence of these indicators meets wetland hydrology criteria.

Wetland UW01 is rated as a Category III wetland in the Ecology rating system (see Table 3), with a moderately high score for hydrologic function (8/9 points), a moderate score for water quality improvement (6/9), and a low score for habitat function (4/9 points). Wetland UW01 has a moderately high potential to provide hydrologic function because it does not have a surface water outlet, has high storage during seasonal ponding, and receives stormwater from the adjacent roadside ditch.

3.1.2 Wetland UW02

Palustrine emergent
Category III
0.00 acre within the project site, 0.97 acre in total

Wetland UW02 is a depressional wetland fringe around a 0.69-acre open water pond, which is included in the total wetland unit acreage, and is fed by impounded water diverted from McCarl Creek and overland flow from surrounding uplands (see Figure 4; and wetland rating Figures 1 through 5 in Appendix E). Delineation data were recorded at sample plots UP03 and UP04 and is provided on datasheets in Appendix C. The upland boundary is defined by an obvious rise in elevation in every direction associated with the original grading of the western pond and observations of primary and secondary hydrology.

Wetland UW02 is a PEM wetland habitat type (Cowardin et al. 1979). The wetland is dominated by reed canary grass, with some other wetland plant species scattered around the edges that include curly dock (*Rumex crispus*, FAC), lamp rush (*Juncus effusus*, FACW), and broad-leaf cat-tail. The dominance of these species meets the wetland vegetation criteria. Wetland UW02 partially overlaps two NWI-mapped wetland types: palustrine forested, broad-leaved deciduous, temporarily flooded (PFO1A) wetland; and palustrine emergent, persistent, unconsolidated bottom, semi-permanently flooded, excavated (PEM1/UBFx) wetland (see Figure 2).

Soils in Wetland UW02 are mapped as Brickmill gravelly ashy loam with 0% to 2% slopes (NRCS 2017a) (see Figure 3). The typical soil profile observed within 16 inches of the soil surface consists of very dark grayish brown (10YR 3/2) silty clay loam over very dark gray (10YR 3/1) silty clay loam with redoximorphic features starting at 7 inches (Munsell Color 2009). The soils in Wetland UW02 meet the hydric soil indicator for Redox Dark Surface (F6).

Primary indicators of hydrology within the wetland include a high water table and saturation within the upper 12 inches. The presence of these indicators meets wetland hydrology criteria.

Wetland UW02 is rated as a Category III wetland in the Ecology rating system, with a moderately high score for hydrologic function (7/9 points) and moderately low scores for water quality improvement and habitat function (5/9 points). Wetland UW02 has a moderately high potential to provide hydrologic functions because of its high storage during seasonal ponding and highly constricted outlet feeding into the eastern pond.

3.1.3 Wetland UW03

Palustrine emergent
Category III
0.00 acre within the project site, 1.19 acres in total

Wetland UW03 is a depressional wetland fringe around a 0.83-acre open water pond, which is included in the total wetland unit acreage, and is fed by impounded water diverted from McCarl Creek that passes through the western pond and overland flow from surrounding uplands (see Figure 4; and wetland rating Figures 1 through 5 in Appendix E). Delineation data were recorded at sample plots UP05 and UP06 and is provided on datasheets in Appendix C. The upland boundary is defined by an obvious rise in elevation in every direction associated with the original grading of the eastern pond and observations of primary and secondary hydrology.

Wetland UW03 is a PEM wetland habitat type (Cowardin et al. 1979). The wetland is dominated by reed canary grass, broad-leaf cat-tail, and colonial bent grass (FAC), with some other wetland plant species scattered around the edges that include curly dock and lamp rush. The dominance of these species meets the wetland vegetation criteria. Wetland UW03 partially overlaps an NWI-mapped palustrine, unconsolidated bottom, permanently flooded, excavated (PUBHx) wetland (see Figure 2).

Soils in Wetland UW03 are mapped as Brickmill gravelly ashy loam with 0% to 2% slopes (NRCS 2017a) (see Figure 3). The typical soil profile observed within 16 inches of the soil surface consists of very dark gray (10YR 3/1) silty clay loam over very dark gray (7.5YR 3/1) silt loam with redoximorphic features starting at 5 inches (Munsell Color 2009). The soils in Wetland UW02 meet the hydric soil indicator for Redox Dark Surface (F6).

No primary indicators of hydrology were observed within the wetland plot (UP05); however, secondary indicators of saturation visible on aerial imagery and the FAC-neutral test were satisfied by field and desktop observations. The presence of these indicators meets wetland hydrology criteria.

Wetland UW03 is rated as a Category III wetland in the Ecology rating system, with a moderately high score for hydrologic function (7/9 points) and moderately low scores for water quality improvement and habitat function (5/9 points). Wetland UW02 has a moderately high potential to provide hydrologic functions because of its high storage during seasonal ponding and highly constricted outlet feeding into the McCarl Creek.

3.2 Frequently Flooded Areas

FEMA floodplain mapping depicts the 100-year floodplain along McCarl Creek and incorporates the two ponds (see Figure 2). This area overlaps most of Wetlands UW02 and UW03 and McCarl Creek, with a total area of 5.56 acres within the project site, and will likely be avoided during project design. Development within the 100-year floodplain will be avoided; therefore, no net loss of floodplain storage will be achieved.

3.3 Geologically Hazardous Areas

The Urtica Solar Project site is not within any mapped geologically hazardous areas. No erosion/landslide geologic hazard areas, snow avalanche hazards, or mine hazard areas are mapped on any of the parcels that encompass the project site (Kittitas County 2017). The Urtica Solar Project will not require specialized engineering to ascertain that the property is suitable for development.

3.4 Habitats

Based on the criteria provided in KCC Chapter 17A.07, the study area only includes riparian habitat. The Urtica Solar Project is not located on federal land or land owned or leased by the WDFW, and therefore is not considered big game winter range.

3.4.1 Riparian Habitat

Two ponds and one intermittent stream (McCarl Creek) and ephemeral ditch are located in the study area. Based on the field observations, McCarl Creek would be considered a jurisdictional water for the USACE, Ecology, and Kittitas County because it satisfies the definition of “waters of the United States” under the Clean Water Rule 40 CFR 230.3. The ponds are fed by water diverted from McCarl Creek and feed back into McCarl Creek through an ephemeral ditch. Because the ponds and ditch are hydrologically connected to McCarl Creek, they would likely be considered jurisdictional. Table 7

summarizes the size, rating, and classification of the streams found in the study area (see Figures 4 and 5). Photographs of these features are provided in Appendix D.

Table 7. Summary of Streams in the Study Area

Stream Name	Tributary to	Stream Type [a]	USACE Jurisdiction [b]	Average Width in Study Area (feet) [c]	Approximate Length in Project Site (feet) [c]
McCarl Creek (US01)	Yakima River	F	RPW	7	2108
Unnamed Ephemeral Ditch	McCarl Creek	N/A	NRPW	3	269

[a] F = fish-bearing stream (WAC 222-16-030), N/A = not applicable, due to ditches and canals being excluded from the WAC typing system.

[b] RPW = relatively permanent water; NPRW = non-relatively permanent water.

[c] Average widths and approximate lengths were determined based on SWCA survey data and field observations.

3.4.1.1 McCarl Creek

McCarl Creek is an intermittent, potentially fish bearing tributary of the Yakima River. Fish presence was not observed in the field and the culvert under Umptanum Road is likely acting as a barrier to fish passage; however, if that barrier were to be replaced, then fish could utilize this stream for a portion of the year. The majority of the on-site portion of this stream has been heavily manipulated and ditched, with a portion of the water flow being diverted through the two ponds that are located north of McCarl Creek and outside of the project site. Diverted water from McCarl Creek feeds the two ponds and their surrounding wetlands (UW02 and UW03), as well as the ephemeral ditch north of the eastern pond that is fed from a hole on the north side of the pond. The ephemeral ditch runs along the north side of the eastern pond and collects water from an outfall pipe from the eastern pond, just before feeding back into McCarl Creek. McCarl Creek flows through the northeastern quarter of the study area for approximately 2,108 feet before leaving the study area through a culvert under Umptanum Road in the northeastern corner of the study area.

The riparian area around McCarl Creek consists primarily of herbaceous species, including reed canary grass, tall scouring-rush (*Equisetum hyemale*), creeping wild rye, prickly lettuce (*Lactuca serriola*), garden yellow-rocket (*Barbarea vulgaris*), curly dock, tall annual willowherb (*Epilobium brachycarpum*), creeping buttercup (*Ranunculus repens*), broad-leaf cat-tail, stinging nettle (*Urtica dioica*), and Fuller's teasel (*Dipsacus fullonum*). Based on the Washington Water Typing Criteria (WAC 222-16-030) and communication with WDFW, McCarl Creek is designated as a Type F water because of its potential to support fish species if downstream barriers were removed.

3.4.2 Priority Habitats and Species

Upon review of the PHS mapper, no PHS-listed species or habitats occur within the study area (WDFW 2017a). The nearest PHS-mapped species are located approximately 0.2 mile northeast of the study area in the Yakima River. In addition, no PHS-mapped areas or their protection buffers occur within the study area; therefore, no additional designation will be required under KCC 17A.07.020.

3.5 Aquifer Recharge Areas

As described in KCC 17A.08.010, no critical aquifer recharge locations have been identified in Kittitas County. Additionally, the Urtica Solar Project will not involve any hazardous materials or disposal of on-site sewage. No well-heads have been identified within the study area.

4 CONCLUSIONS AND RECOMMENDATIONS

EFSEC will provide permitting requirements for the Urtica Solar Project, but this report evaluates and shows compliance with County requirements. A review of the study area determined that the following Kittitas County defined critical areas have the potential to be affected by the Urtica Solar Project:

- Wetlands
- Frequently Flooded Areas
- Habitats:
    - Riparian Habitat

A summary of all wetlands, waters, and critical area buffers documented within the study area is provided in Table 8. The wetland and non-wetland waters identified in this study will likely be determined jurisdictional by Ecology and the USACE, including the delineated ditch. Although EFSEC will provide permitting requirements for the proposed project, to show compliance with County requirements, KCC guidance (Chapter 17A.07.010) defines a minimum 20-foot protection buffer for Type F waters, such as McCarl Creek. However, up to a 100-foot protection buffer could be requested once Kittitas County has had the opportunity to review the results of this study, and has had discussions with TUUSSO (see Figures 4 and 5). KCC guidance does not define protection buffers for the ephemeral ditch because it does not qualify as a stream.

To show compliance with County requirements, the minimum and maximum wetland protection buffers defined by the KCC (Chapter 17A.04.020) are listed in Appendix F, and are provided for these wetlands in Table 8, but only the minimum protection buffers are depicted on Figures 4 and 5.

Table 8. Wetland and Waters Summary

Critical Area	Wetland Rating/Water Typing [a]	Kittitas County Minimum/Maximum Buffer Distances (feet) [b]	Total Size of Feature Within the Project Site (acres) [c]
Wetlands			
Wetland UW01	III	0 / 0 [d]	0.05
Wetland UW02	III	20 / 80	0.00
Wetland UW03	III	20 / 80	0.00
Frequently Flooded Areas			
100-year flood zone	N/A	N/A	5.56
Riparian Habitat			
McCarl Creek (US01)	F	20 / 100	0.32
Ditch	N/A	None	0.01

[a] III = Category III (Hruby 2014); F = fish bearing water (WAC 22-16-030);
[b] Only minimum buffer distances are depicted on maps;
[c] Does not include buffer areas;
[d] No Kittitas County buffer is defined because the wetland area is below the minimum size threshold for protection; however, building setbacks may be required based on zoning lot line setbacks, but would not exceed 25 feet.

Design plans are incomplete for the proposed Urtica Solar Project; however, TUUSSO will attempt to design the project to avoid, reduce, or eliminate impacts to wetlands, waters, and their buffers. Following the finalization of the design footprint, all removal-fill activities proposed within jurisdictional features would require a Joint Aquatic Resources Permit Application (JARPA) submitted for USACE and Ecology review.

There is no minimum threshold to implement mitigation sequencing for potential impacts to wetland and water features. Where possible, the Urtica Solar Project should demonstrate avoidance of jurisdictional features and then minimization of impacts. Avoidance and minimization could be achieved by making minor design alterations around delineated feature boundaries.

Where impact avoidance is not possible, mitigation measures should be implemented to minimize temporary construction disturbance and other permanent alterations to the features. Mitigation would include the implementation of construction best management practices. Where permanent alterations to wetland and waters features are unavoidable, wetland mitigation measures to achieve "no net loss" would be required. Desktop research shows that there are no approved mitigation banks or in-lieu fee programs in Kittitas County; therefore, any mitigation that would be required must be conducted as an Advance Permittee-Responsible Mitigation. Under KCC guidance (Chapter 17A.04.050), the mitigation ratio for a Category III wetland is 1:1.

5 DISCLAIMER

This report documents the investigation, best professional judgment, and conclusions of the investigators. This should be considered a Preliminary Jurisdictional Determination of wetlands and other waters and is not a final determination.

6 LITERATURE CITED AND REVIEWED

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. FWS/OBS-79/31. Washington, D.C.: U.S. Fish and Wildlife Service. Available at: http://www.fws.gov/wetlands/Documents/Classification-of-Wetlands-and-Deepwater-Habitats-of-the-United-States.pdf.

Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*. Technical Report Y-87-1. Online edition. Vicksburg, Mississippi: U.S. Army Engineer Waterways Experiment Station. Available at: http://el.erdc.usace.army.mil/wetlands/pdfs/wlman87.pdf.

Hruby, T. 2014. *Washington State Wetland Rating System for Eastern Washington – Revised.* Washington State Department of Ecology Publication No. 14-06-030. Olympia, Washington: Department of Ecology. Available at: https://fortress.wa.gov/ecy/publications/SummaryPages/1406030.html. Accessed March 10, 2017.

Kittitas County Code (KCC). 2017. Kittitas County, Washington, Ordinances and Resolutions. Available at: http://co.kittitas.wa.us/boc/countycode/. Accessed March 13, 2017.

Kittitas County. 2017. COMPAS Mapping Tool Parcel Report. Available at: https://gis.co.kittitas.wa.us/compas/default.aspx. Accessed May 15, 2017.

Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. *The National Wetland Plant List: 2016 Wetland Ratings.* Phytoneuron 2016-30:1–17. Available at: http://www.phytoneuron.net/ and http://rsgisias.crrel.usace.army.mil/NWPL/. Accessed May 3, 2016.

Munsell Color. 2009. Munsell Soil-Color Charts. Revised Edition. Grand Rapids, Michigan: Munsell Color.

Natural Resources Conservation Service (NRCS). 2008. *Hydrogeomorphic Wetland Classification System: An Overview and Modification to Better Meet the Needs of the Natural Resources Conservation Service*. Technical Note No. 190-8-79. Available at: http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs143_010784.pdf.

———. 2015. List of Hydric Soils. December 2015. Available at: http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/use/hydric/. Accessed March 9, 2016.

———. 2017a. Web soil survey. Available at: http://websoilsurvey.nrcs.usda.gov/app/. Accessed March 10, 2017.

———. 2017b. WETS and precipitation data for Ellensburg, Washington. Available at: http://agacis.rcc-acis.org/. Accessed May 2, 2017.

Olson, P., and E. Stockdale. 2010. *Determining the Ordinary High Water Mark on Streams in Washington State*. Second Review Draft. Ecology Publication No. 08-06-001. Lacey, Washington: Washington State Department of Ecology, Shorelands and Environmental Assistance Program.

U.S. Army Corps of Engineers (USACE). 2008. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)*, edited by J.S. Wakeley, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-08-28. Vicksburg, Mississippi: U.S. Army Engineer Research and Development Center.

U. S. Department of Agriculture (USDA). 1954. Kittitas County. Central Washington Historical Aerial Photograph Project. Central Washington University, Department of Geography. Available at: http://www.gis.cwu.edu/geog/historical_airphotos/. Accessed on June 23, 2017.

U. S. Fish and Wildlife Service (USFWS). 2017. National Wetland Inventory. Wetlands Online Mapper. Available at: http://wetlandsfws.er.usgs.gov/wtlnds/launch.html. Accessed March 10, 2017.

Washington State Department of Ecology (Ecology). 1997. Washington State Wetland Identification and Delineation Manual. Publication No. 96-94. Olympia, Washington: Washington State Department of Ecology.

Washington State Department of Fish and Wildlife (WDFW). 2017a. Priority Habitats and Species on the Web. Available at: http://wdfw.wa.gov/mapping/phs/. Accessed March 10, 2017.

———. 2017b. SalmonScape. Available at: http://wdfw.wa.gov/mapping/salmonscape. Accessed March 10, 2017.

APPENDIX A: WETLAND DELINEATION METHODOLOGY

Wetlands are defined as areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and which under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. The methods used to delineate wetlands within the study area conform to guidance in the *Washington State Wetland Identification and Delineation Manual* (Ecology 1997), the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987), and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* (USACE 2008).

To be considered a wetland by the U.S. Army Corps of Engineers (USACE), an area must express hydrophytic vegetation, hydric soils, and wetland hydrology. SWCA Environmental Consultants (SWCA) staff documented site conditions for these parameters in areas representative of the project site and in areas most likely to exhibit wetland features. Staff collected additional data in associated uplands, as needed, to confirm wetland boundaries. Wetland boundaries, stream boundaries, and wetland data plot locations in the study area were recorded with a Trimble Geo XT global positioning system (GPS) unit. All delineated wetlands and streams were processed and projected onto existing base maps using ArcGIS software.

Vegetation

The dominant and sub-dominant plants were identified and recorded at each sample plot location. These plants were evaluated based on their wetland indicator status to determine if the vegetation was hydrophytic. SWCA biologists utilized the 50/20 rule per USACE recommendations to determine which plants were dominant at each sample plot. Under this guidance, absolute cover estimates were made for each species found rooted within the sample plot radius for each vegetative strata found in the habitat (tree, sapling/shrub, herb, and woody vine). Refer to the USACE regional supplement for exact applications of this method of determining dominance (USACE 2008).

Sample plot radii varied in size depending on site topography and habitat complexity. When documenting vegetation in smaller or oddly-shaped wetlands or habitat features, vegetation strata radii may be adjusted to more accurately depict vegetation rooted within the wetland or habitat feature being delineated.

Hydrophytic vegetation is defined as vegetation adapted to wetland conditions, such as inundation or prolonged saturation. To meet the hydrophytic vegetation criterion, more than 50% of the total dominant plants across all stratums must have a wetland indicator status of Facultative (FAC), Facultative Wetland (FACW), or Obligate (OBL). The wetland indicator status is assigned to plant species that have the potential to occur in wetlands by the USACE (Lichvar et al. 2016). Table A-1 lists the definitions for each wetland indicator status.

Table A-1. Definitions for Each Wetland Plant Indicator Status

Wetland Indicator Status	Symbol	Definition
Obligate Wetland Plants	OBL	Plants that almost always (> 99% of the time) occur in wetlands, but which may rarely (< 1% of the time) occur in non-wetlands.
Facultative Wetland Plants	FACW	Plants that often (67 to 99% of the time) occurs in wetlands, but sometimes (1 to 33% of the time) occur in non-wetlands.
Facultative Plants	FAC	Plants with a similar likelihood (34 to 66% of the time) of occurring in both wetlands and non-wetlands.
Facultative Upland Plants	FACU	Plants that sometimes (1 to 33% of the time) occur in wetlands, but occur more often (67 to 99% of the time) in non-wetlands.
Upland Plants	UPL	Plants that rarely (< 1% of the time) occur in wetlands, and almost always (> 99% of the time) occur in non-wetlands.

Source: Lichvar et al. (2016).

SWCA biologists identified plants found in the field to species whenever possible, when adequate vegetative or flowering characteristics were available. Scientific and common plant names were reported with the currently accepted nomenclature.

Soils

An area typically must contain hydric soils to be considered a wetland, except when problematic site conditions occur. Hydric soils typically form under an area that experiences durations of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper portion of the soil profile. Chemical and biological processes in saturated soil result in reduced oxygen concentrations and promote anaerobic metabolism in microorganisms. These prolonged anaerobic conditions often create mottling and other distinct patterns in the soil, which are used as indicators of hydric soils. The hue, value, and chroma and relative percentage of mottling are recorded in the field at each data plot location. Other important hydric soil indicators include organic matter accumulations in the surface horizon, reduced sulfur odors, and organic matter staining in the soil profile (Natural Resource Conservation Service [NRCS] 2017a).

SWCA staff examined soil profiles at each data plot location by excavating sample pits to a depth of 16 to 20 inches to observe the soil profile, colors, and textures. In some cases, a shallower soil pit was used due to shovel refusal from obstructions in the soil profile, such as gravel, bedrock, thick roots, or clay hardpan. Munsell color charts (Munsell Color 2009) were used to determine soil colors in the field.

Hydrology

SWCA staff investigated the entire project site for evidence of wetland hydrology. Where data plot locations were taken, additional notes were recorded to fully document the presence of primary and secondary wetland hydrology indicators at the sample location. According to the USACE, wetland hydrology criteria were considered to be satisfied if the soil was seasonally inundated or saturated to the surface for a consecutive number of days greater than or equal to 12.5% of the growing season. The growing season for the area was determined based on the period in which temperatures are above 28 degrees Fahrenheit 5 out of 10 years (Ecology 1997) using the long-term climatological data collected by the NRCS (2017). Using the wetlands climate analysis (WETS) table for the nearest station (Ellensburg, Washington), the growing season was approximated as typically between April 20 and October 10, or a total of 173 days (NRCS 17b).

However, often times multiple site visits to determine the duration of seasonal inundation or saturation are not possible. Therefore, field indicators are used in an attempt to determine an area's hydro-period through field observations. Wetland hydrology indicators are divided into two categories: primary and secondary indicators (USACE 2008). Primary indicators of hydrology include, but are not limited to, surface inundation and high water table and saturated soils within 12 inches of the soil surface. The presence of one primary indicator is sufficient to conclude that wetland hydrology is present. Secondary hydrology indicators are also recorded and may substitute in the case of a lack of any primary indicators if multiple secondary indicators are observed. Secondary indicators of hydrology include, but are not limited to, drainage patterns, crayfish burrows, and dry-season water table (USACE 2008). If no primary indicators, and fewer than two secondary indicators, are observed within the sample area, then it is likely that the area is not considered a wetland, unless problematic conditions exist on-site. Aerial and historic imagery are often reviewed before and after site visits to ensure all possible hydrology indicators are taken into account.

References

Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*. Technical Report Y-87-1. Online edition. Vicksburg, MSMississippi: U.S. Army Engineer Waterways Experiment Station. Available at: http://el.erdc.usace.army.mil/wetlands/pdfs/wlman87.pdf.

Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. *The National Wetland Plant List: 2016 Wwetland Rratings.* Phytoneuron 2016-30:1–17. Available at: http://www.phytoneuron.net/ and http://rsgisias.crrel.usace.army.mil/NWPL/. Accessed May 3, 2016.

Munsell Color. 2009. Munsell Soil-Color Charts. Revised Edition. Grand Rapids, MichiganI: Munsell Color.

Natural Resources Conservation Service (NRCS). 2017a. *Field Indicators of Hydric Soils in the United States, a Guide for Identifying and Delineating Hydric Soils, Version 8.1*. Edited by L.M. Vasilas, G.W. Hurt, and J.F. Berkowitz. Available at: https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_053171.pdf. Accessed March 10, 2017.

———. 2017b. WETS and precipitation data for Ellensburg, Washington. Available at: http://agacis.rcc-acis.org/. Accessed May 2, 2017.

U.S. Army Corps of Engineers (USACE). 2008. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)*, edited by. J.S. Wakeley, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-08-28. Vicksburg, MississippiS: U.S. Army Engineer Research and Development Center.

Washington State Department of Ecology (Ecology). 1997. Washington State Wetland Identification and Delineation Manual. Publication No. #96-94. Olympia, Washington: Washington State Department of Ecology.

APPENDIX B: VEGETATION LIST

Urtica Solar Project
Vegetation Table
April 6-7, 2017

Common Name	Scientific Name	Wetland Indicator Status[1]	Native / Introduced and Invasive / Noxious
Colonial Bent	*Agrostis capillaris*	FAC	non-native
Garden Yellow-Rocket	*Barbarea vulgaris*	FAC	non-native
Devil's-Pitchfork	*Bidens frondosa*	FACW	native
Shepherd's-Purse	*Capsella bursa-pastoris*	FACU	non-native
sedge	*Carex species*	OBL to FACU	-
spotted knapweed	*Centaurea stoebe*	NOL	noxious
Canadian Thistle	*Cirsium arvense*	FACU	invasive, noxious
Orchard Grass	*Dactylis glomerata*	FACU	non-native
Queen Anne's-Lace	*Daucus carota*	UPL	non-native, noxious
Fuller's Teasel	*Dipsacus fullonum*	FAC	invasive, noxious
common viper's bugloss	*Echium vulgare*	NOL	non-native
Creeping Wild Rye	*Elymus repens*	FAC	non-native
tall annual willowherb	*Epilobium brachycarpum*	NOL	native
Tall Scouring-Rush	*Equisetum hyemale*	FACW	native
Hairy Cat's-Ear	*Hypochaeris radicata*	FACU	non-native, noxious
Baltic Rush	*Juncus balticus*	FACW	native
Lamp Rush	*Juncus effusus*	FACW	native
Prickly Lettuce	*Lactuca serriola*	FACU	non-native
Common Duckweed	*Lemna minor*	OBL	native
Spearmint	*Mentha spicata*	FACW	non-native
True Forget-Me-Not	*Myosotis scorpioides*	FACW	non-native
scotch thistle	*Onopordum acanthium*	NOL	noxious
Reed Canary Grass	*Phalaris arundinacea*	FACW	invasive, noxious
Common Timothy	*Phleum pratense*	FACU	non-native
English Plantain	*Plantago lanceolata*	FAC	non-native
bluegrass	*Poa species*	FAC ?	-
Quaking Aspen	*Populus tremuloides*	FACU	native
Creeping Buttercup	*Ranunculus repens*	FAC	non-native
Black Locust	*Robinia pseudoacacia*	FACU	non-native
Curly Dock	*Rumex crispus*	FAC	non-native
crack willow	*Salix X fragilis*	FAC	non-native
Common Dandelion	*Taraxacum officinale*	FACU	non-native
yellow salsify	*Tragopogon dubius*	NOL	non-native
White Clover	*Trifolium repens*	FACU	non-native
Broad-Leaf Cat-Tail	*Typha latifolia*	OBL	native
Stinging Nettle	*Urtica dioica*	FAC	native
Great Mullein	*Verbascum thapsus*	FACU	non-native

[1]Wetland Indicator Status (WIS) from the NWPL AW Region - see below.

A question mark (?) preceded by a space indicates our default assumption that the plant is FAC.

Wetland Indicator Status (WIS) and taxonomy for the AW Region per the National Wetland Plant List 2016v3.3:
(common names are capitalized) http://wetland-plants.usace.army.mil/ Accessed January 10, 2017
WIS for non-wetland plants and taxonomy from Reed 1988 and Reed et al. 1993, and the USDA PLANTS database:
(common names are not capitalized) http://plants.usda.gov/ Accessed multiple dates

Native per Hitchcock & Cronquist 1973 and http://plants.usda.gov/
Noxious per Washington State NWCB 2017 http://www.nwcb.wa.gov/

WETLAND INDICATOR STATUS - Arid West Region	
OBL	**Obligate Wetland** – Almost always is a hydrophyte, rarely in uplands. Examples: broad-leaf cat-tail, yellow-skunk-cabbage
FACW	**Facultative Wetland** - Usually is a hydrophyte but occasionally found in uplands. Examples: Oregon ash, red osier
FAC	**Facultative** – Commonly occurs as either a hydrophyte or non-hydrophyte. Examples: red alder, salmon raspberry
FACU	**Facultative Upland** - Occasionally is a hydrophyte but usually occurs in uplands. Examples: big-leaf maple, Himalayan blackberry
UPL	**Upland** - Rarely is a hydrophyte, almost always in uplands. These plants have been removed from the NWPL WMVC Region.
NOL	**Not Listed** - Not on the list; assumed to be UPL.

APPENDIX C: WETLAND DATA SHEETS

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Urtica Solar Project City/County: - / Kittitas Sampling Date: 4/6/2017

Applicant/Owner: TUUSSO Energy, LLC State: WA Sampling Point: **UP01**

Investigator(s): Evan Dulin, Jamie Young Section, Township, Range: Section 10, T17N, R18E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 3

Subregion (LRR): B, Columbia/Snake River Plateau Lat: 46.972973 Long: -120.570319 Datum: NAD 1983

Soil Map Unit Name: Nanum ashy loam, 2 to 5 percent slopes (481) NWI classification: None

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

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

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

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

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

Precipitation prior to fieldwork: 0.48" two weeks prior, 2.28" above normal for CYTD, 2.74" above normal for WYTD. *Wetter than normal.

Remarks:

UW01. Wetland is in a depression that is fed by diverted water from a roadside ditch uphill to the east and runoff from the fields to the west..

VEGETATION

Tree Stratum (Plot size: 30' r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0% = Total Cover		
Sapling/Shrub Stratum (Plot size: 10' r)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 5' r)			
1. *Phalaris arundinacea*	55%	Yes	FACW
2. *Typha latifolia*	20%	Yes	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	75% = Total Cover		
Woody Vine Stratum (Plot size: 10' r)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 25%

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% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species 20	x 1 =	20
FACW species 55	x 2 =	110
FAC species 0	x 3 =	0
FACU species 0	x 4 =	0
UPL species 0	x 5 =	0
Column Totals: 75 (A)		130 (B)

Prevalence Index = B/A = 1.73

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.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

25% bare ground where previously ponded and dominated by *Lemna minor*.

Entered by: KL/ED QC by: TJD

SOIL

Sampling Point: **UP01**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 3/2	95	7.5YR 4/6	5	C	PL	SiL	
2	10YR 4/2	100					Sand	very thin layer
2-8	10YR 3/2	95	7.5YR 4/6	5	C	PL	SiL	
8-13+	2.5Y 3/1	80	7.5YR 4/6	15	C	PL	SiL	
			7.5YR 3/4	5	C	PL		

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

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: None

Depth (inches): N/A

Hydric Soil Present? Yes X No ___

Remarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)
2" thick mat of organic matter extends above soil surface.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- X Surface Soil Cracks (B6)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- X 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)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes	___	No	X	Depth (inches): N/A
Water Table Present?	Yes	___	No	X	Depth (inches): >13
Saturation Present? (includes capillary fringe)	Yes	X	No	___	Depth (inches): 0-8

Wetland Hydrology Present? Yes X No ___

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

Remarks: Entered by: KL/ED QC by: TJD

Living snails were observed in area of previously open water that recently dried up. Surface saturation from recent ponding, surface water driven.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Urtica Solar Project City/County: - / Kittitas Sampling Date: 4/6/2017

Applicant/Owner: TUUSSO Energy, LLC State: WA Sampling Point: **UP02**

Investigator(s): Evan Dulin, Jamie Young Section, Township, Range: Section 10, T17N, R18E

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 1

Subregion (LRR): B, Columbia/Snake River Plateau Lat: 46.973019 Long: -120.570343 Datum: NAD 1983

Soil Map Unit Name: Brysill cobbly ashy loam, 0 to 2 percent slopes (801) NWI classification: None

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

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

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

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

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

Precipitation prior to fieldwork: 0.48" two weeks prior, 2.28" above normal for CYTD, 2.74" above normal for WYTD. *Wetter than normal.

Remarks:
Sample plot is approximately 4' higher in elevation than UP01 in planted timothy field.

VEGETATION

Tree Stratum (Plot size: 30' r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0% = Total Cover		
Sapling/Shrub Stratum (Plot size: 10' r)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 5' r)			
1. *Phleum pratense*	90%	Yes	FACU
2. *Cirsium arvense*	5%	No	FACU
3. *Phalaris arundinacea*	5%	No	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 10' r)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species 0	x 1 =	0
FACW species 5	x 2 =	10
FAC species 0	x 3 =	0
FACU species 95	x 4 =	380
UPL species 0	x 5 =	0
Column Totals: 100 (A)		390 (B)

Prevalence Index = B/A = 3.90

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.

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

Remarks:
Planted timothy.

Entered by: KL/ED QC by: TJD

SOIL

Sampling Point: **UP02**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-9	10YR 3/2	100					SiCL	
9-14	10YR 3/1	98	7.5YR 3/4	2	C	M	SiCL	

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

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: None

Depth (inches): N/A

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

Remarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)
Redox features below 9" could possibly be relic redox.

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	N/A
Water Table Present?	Yes ___	No X	Depth (inches):	>14
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches):	>14

Wetland Hydrology Present?

Yes ___ **No X**

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

Remarks:

Entered by: KL/ED QC by: TJD

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Urtica Solar Project City/County: - / Kittitas Sampling Date: 4/7/2017

Applicant/Owner: TUUSSO Energy, LLC State: WA Sampling Point: **UP03**

Investigator(s): Evan Dulin, Jamie Young Section, Township, Range: Section 10, T17N, R18E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1

Subregion (LRR): B, Columbia/Snake River Plateau Lat: 46.973920 Long: -120.578257 Datum: NAD 1983

Soil Map Unit Name: Brickmill gravelly ashy loam, 0 to 2 percent slopes (601) NWI classification: None

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

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

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

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

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

Precipitation prior to fieldwork: 0.60" two weeks prior, 2.39" above normal for CYTD, 2.85" above normal for WYTD. *Wetter than normal.

Remarks:

UW02. Wetland on fringes of the permanent open water area of the western pond.

VEGETATION

Tree Stratum (Plot size: 30' r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0% = Total Cover		
Sapling/Shrub Stratum (Plot size: 10' r)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 5' r)			
1. *Phalaris arundinacea*	95%	Yes	FACW
2. *Rumex crispus*	5%	No	FAC
3. *Epilobium brachycarpum*	3%	No	NOL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	103% = Total Cover		
Woody Vine Stratum (Plot size: 10' r)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species 0	x 1 =	0
FACW species 95	x 2 =	190
FAC species 5	x 3 =	15
FACU species 0	x 4 =	0
UPL species 3	x 5 =	15
Column Totals: 103 (A)		220 (B)

Prevalence Index = B/A = 2.14

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.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

Entered by: KL/ED QC by: TJD

SOIL

Sampling Point: **UP03**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR 3/2	100					SiCL	
7-14	10YR 3/1	98	7.5YR 3/3	2	C	PL	SiCL	

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

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: None

Depth (inches): N/A

Hydric Soil Present? Yes X No ___

Remarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	N/A
Water Table Present?	Yes X	No ___	Depth (inches):	8
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches):	5

Wetland Hydrology Present? Yes X No ___

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

Remarks:
About 6' from the pond's OHWM.

Entered by: KL/ED QC by: TJD

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Urtica Solar Project City/County: - / Kittitas Sampling Date: 4/7/2017

Applicant/Owner: TUUSSO Energy, LLC State: WA Sampling Point: **UP04**

Investigator(s): Evan Dulin, Jamie Young Section, Township, Range: Section 10, T17N, R18E

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 4

Subregion (LRR): B, Columbia/Snake River Plateau Lat: 46.973974 Long: -120.578279 Datum: NAD 1983

Soil Map Unit Name: Brickmill gravelly ashy loam, 0 to 2 percent slopes (601) NWI classification: None

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

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

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

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

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

Precipitation prior to fieldwork: 0.60" two weeks prior, 2.39" above normal for CYTD, 2.85" above normal for WYTD. *Wetter than normal.

Remarks:
Sample plot located on edge of planted timothy field.

VEGETATION

Tree Stratum (Plot size: 30' r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0% = Total Cover		
Sapling/Shrub Stratum (Plot size: 10' r)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 5' r)			
1. *Phleum pratense*	90%	Yes	FACU
2. *Phalaris arundinacea*	10%	No	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 10' r)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species 0	x 1 =	0
FACW species 10	x 2 =	20
FAC species 0	x 3 =	0
FACU species 90	x 4 =	360
UPL species 0	x 5 =	0
Column Totals: 100 (A)		380 (B)

Prevalence Index = B/A = 3.80

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.

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

Remarks:
Planted timothy.

Entered by: KL/ED QC by: TJD

SOIL

Sampling Point: **UP04**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR 3/1	100					SiCL	
7-11+	10YR 3/1	99	7.5YR 3/2	1	C	PL	SiCL	faint redox

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

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: None

Depth (inches): N/A

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

Remarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)
Shovel refusal 11" due to rocks.

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	N/A
Water Table Present?	Yes ___	No X	Depth (inches):	>12
Saturation Present? (includes capillary fringe)	Yes X	No X	Depth (inches):	0-3

Wetland Hydrology Present?

Yes ___ **No** X

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

Remarks:
0-3" of saturation at surface from recent rainfall.

Entered by: KL/ED QC by: TJD

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Urtica Solar Project City/County: - / Kittitas Sampling Date: 4/7/2017

Applicant/Owner: TUUSSO Energy, LLC State: WA Sampling Point: **UP05**

Investigator(s): Evan Dulin, Jamie Young Section, Township, Range: Section 10, T17N, R18E

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1

Subregion (LRR): B, Columbia/Snake River Plateau Lat: 46.974175 Long: -120.577216 Datum: NAD 1983

Soil Map Unit Name: Brickmill gravelly ashy loam, 0 to 2 percent slopes (601) NWI classification: None

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

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

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

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

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

Precipitation prior to fieldwork: 0.60" two weeks prior, 2.39" above normal for CYTD, 2.85" above normal for WYTD. *Wetter than normal.

Remarks:

UW03. Wetland on fringes of the permanent open water area of the eastern pond.

VEGETATION

Tree Stratum (Plot size: 30' r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0% = Total Cover		
Sapling/Shrub Stratum (Plot size: 10' r)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 5' r)			
1. *Phalaris arundinacea*	40%	Yes	FACW
2. *Typha latifolia*	20%	Yes	OBL
3. *Agrostis capillaris*	20%	Yes	FAC
4. *Juncus effusus*	10%	No	FACW
5. *Carex species*	10%	No	FAC ?
6.			
7.			
8.			
9.			
10.			
11.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 10' r)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 0%

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% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species 20	x 1 =	20
FACW species 50	x 2 =	100
FAC species 30	x 3 =	90
FACU species 0	x 4 =	0
UPL species 0	x 5 =	0
Column Totals: 100 (A)		210 (B)

Prevalence Index = B/A = 2.10

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.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Entered by: KL/ED QC by: TJD

SOIL

Sampling Point: **UP05**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 3/1	100					SiCL	
5-14	7.5YR 3/1	93	7.5YR 3/4	7	C	M, PL	SiL	

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

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: None

Depth (inches): N/A

Hydric Soil Present? Yes X No ___

Remarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)
Small streaks of black Mn concentrations from 7-14".

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	N/A
Water Table Present?	Yes ___	No X	Depth (inches):	>14
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches):	>14

Wetland Hydrology Present? Yes X No ___

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

Remarks: Entered by: KL/ED QC by: TJD
About 9' from the pond's OHWM, appears to be fed by overland flooding from pond (does not appear to be fed by groundwater from the pond). Saturation visible on aerial imagery.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Urtica Solar Project City/County: - / Kittitas Sampling Date: 4/7/2017

Applicant/Owner: TUUSSO Energy, LLC State: WA Sampling Point: **UP06**

Investigator(s): Evan Dulin, Jamie Young Section, Township, Range: Section 10, T17N, R18E

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 4

Subregion (LRR): B, Columbia/Snake River Plateau Lat: 46.974139 Long: -120.577325 Datum: NAD 1983

Soil Map Unit Name: Brickmill gravelly ashy loam, 0 to 2 percent slopes (601) NWI classification: None

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

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

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

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

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

Precipitation prior to fieldwork: 0.60" two weeks prior, 2.39" above normal for CYTD, 2.85" above normal for WYTD. *Wetter than normal.

Remarks:
Sample plot located on edge of planted timothy field.

VEGETATION

Tree Stratum (Plot size: 30' r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0% = Total Cover		
Sapling/Shrub Stratum (Plot size: 10' r)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 5' r)			
1. *Phleum pratense*	95%	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	95% = Total Cover		
Woody Vine Stratum (Plot size: 10' r)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 5%

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	95	x 4 =	380
UPL species	0	x 5 =	0
Column Totals:	95 (A)		380 (B)

Prevalence Index = B/A = 4.00

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.

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

Remarks:
Planted timothy.

Entered by: KL/ED QC by: TJD

SOIL

Sampling Point: **UP06**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/2	100					SiL	
10-14	10YR 3/2	97	10YR 3/3	3	C	M	SiL	faint redox

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

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: None

Depth (inches): N/A

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

Remarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	N/A
Water Table Present?	Yes ___	No X	Depth (inches):	>14
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches):	>14

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

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

Remarks:

Entered by: KL/ED QC by: TJD

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Urtica Solar Project City/County: - / Kittitas Sampling Date: 4/7/2017

Applicant/Owner: TUUSSO Energy, LLC State: WA Sampling Point: **UP07**

Investigator(s): Evan Dulin, Jamie Young Section, Township, Range: Section 10, T17N, R18E

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 1

Subregion (LRR): B, Columbia/Snake River Plateau Lat: 46.975018 Long: -120.575117 Datum: NAD 1983

Soil Map Unit Name: Brickmill gravelly ashy loam, 0 to 2 percent slopes (601) NWI classification: None

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

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

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

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

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

Precipitation prior to fieldwork: 0.60" two weeks prior, 2.39" above normal for CYTD, 2.85" above normal for WYTD. *Wetter than normal.

Remarks:
Sample plot located about 20' north of US01.

VEGETATION

Tree Stratum (Plot size: 30' r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0% = Total Cover		
Sapling/Shrub Stratum (Plot size: 10' r)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 5' r)			
1. *Phalaris arundinacea*	100%	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 10' r)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	100	x 2 =	200
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		200 (B)

Prevalence Index = B/A = 2.00

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.

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

Remarks: Entered by: KL/ED QC by: TJD

SOIL

Sampling Point: **UP07**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/2	100					SiCL	
10-14+	10YR 3/1	98	7.5YR 3/4	2	C	M	SiCL	

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

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: None

Depth (inches): N/A

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

Remarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	N/A
Water Table Present?	Yes ___	No X	Depth (inches):	>14
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches):	>14

Wetland Hydrology Present?

Yes ___ **No X**

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

Remarks:

Entered by: KL/ED QC by: TJD

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Urtica Solar Project City/County: - / Kittitas Sampling Date: 4/7/2017

Applicant/Owner: TUUSSO Energy, LLC State: WA Sampling Point: **UP08**

Investigator(s): Evan Dulin, Jamie Young Section, Township, Range: Section 10, T17N, R18E

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

Subregion (LRR): B, Columbia/Snake River Plateau Lat: 46.974528 Long: -120.570668 Datum: NAD 1983

Soil Map Unit Name: Brickmill gravelly ashy loam, 0 to 2 percent slopes (601) NWI classification: None

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

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

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

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

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

Precipitation prior to fieldwork: 0.60" two weeks prior, 2.39" above normal for CYTD, 2.85" above normal for WYTD. *Wetter than normal.

Remarks:

Sample plot is located on low stream terrace overgrown by *Phalaris arundinacea* adjacent to US01. Does not meet wetland criteria.

VEGETATION

Tree Stratum (Plot size: 30' r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0% = Total Cover		
Sapling/Shrub Stratum (Plot size: 10' r)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 5' r)			
1. *Phalaris arundinacea*	100%	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 10' r)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 0%

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	100	x 2 =	200
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		200 (B)

Prevalence Index = B/A = 2.00

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.

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

Remarks:

Entered by: KL/ED QC by: TJD

SOIL

Sampling Point: **UP08**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/2	100					SiCL	
8-15	10YR 3/1	89	10YR 3/3	1	C	M	SiCL	mixed matrix
	10YR 3/2	10					SiCL	mixing from top

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

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: None

Depth (inches): N/A

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

Remarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)
Large roots present throughout.

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	N/A
Water Table Present?	Yes ___	No X	Depth (inches):	>15
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches):	>15

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

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

Remarks: Entered by: KL/ED QC by: TJD

Plot is located about 8' from the stream's OHWM, approximately 3' in elevation above the current stream level (stream is nearly full). Area Could have previously been a floodplain for US01 prior to ditching of the stream. Does not meet wetland criteria.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Urtica Solar Project City/County: - / Kittitas Sampling Date: 4/7/2017

Applicant/Owner: TUUSSO Energy, LLC State: WA Sampling Point: **UP09**

Investigator(s): Evan Dulin, Jamie Young Section, Township, Range: Section 10, T17N, R18E

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Convex Slope (%): 1

Subregion (LRR): B, Columbia/Snake River Plateau Lat: 46.974892 Long: -120.570391 Datum: NAD 1983

Soil Map Unit Name: Brickmill gravelly ashy loam, 0 to 2 percent slopes (601) NWI classification: None

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

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

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

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

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

Precipitation prior to fieldwork: 0.60" two weeks prior, 2.39" above normal for CYTD, 2.85" above normal for WYTD. *Wetter than normal.

Remarks:
Sample plot is located in a low spot at the bottom of the field, approximately 40' west of the stream's OHWM.

VEGETATION

Tree Stratum (Plot size: 30' r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0% = Total Cover		
Sapling/Shrub Stratum (Plot size: 10' r)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 5' r)			
1. *Poa species*	40%	Yes	FAC ?
2. *Juncus balticus*	30%	Yes	FACW
3. *Rumex crispus*	10%	No	FAC
4. *Taraxacum officinale*	10%	No	FACU
5. *Trifolium repens*	5%	No	FACU
6.			
7.			
8.			
9.			
10.			
11.			
	95% = Total Cover		
Woody Vine Stratum (Plot size: 10' r)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 5%

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% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species 0	x 1 =	0
FACW species 30	x 2 =	60
FAC species 50	x 3 =	150
FACU species 15	x 4 =	60
UPL species 0	x 5 =	0
Column Totals: 95 (A)		270 (B)

Prevalence Index = B/A = 2.84

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.

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

Remarks:

Entered by: KL/ED QC by: TJD

SOIL

Sampling Point: **UP09**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 3/2	100					SiCL	
5-15	10YR 3/1	80	7.5YR 2.5/3	18	C	M, PL	SiL	
			2.5Y 5/4	2	D	M		

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

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: None

Depth (inches): N/A

Hydric Soil Present? Yes X No ___

Remarks: S = sand; Si = silt; C = clay; L = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)
Large rocks present throughout soil.

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	N/A
Water Table Present?	Yes ___	No X	Depth (inches):	>15
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches):	>15

Wetland Hydrology Present?

Yes ___ No X

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

Remarks:

Entered by: KL/ED QC by: TJD

APPENDIX D: WETLAND AND STREAM PHOTOGRAPHS

Photo A. View south of Wetland UW01 (UP02).

Photo B. View down of living snails in Wetland UW01.

Photo C. View southeast of off-site roadside ditch and drain east of Wetland UW01.

Photo D. View west of McCarl Creek (US01) in the southwest corner, off-site.

Photo E. View east of McCarl Creek where water is siphoned to the western pond.

Photo F. View southwest of confluence of McCarl Creek (left) with pond side ditch.

Photo G. View northeast of the middle portion of McCarl Creek.

Photo H. View south of McCarl Creek along eastern site boundary.

Photo I. View northeast of McCarl Creek flowing off-site through a culvert.

Photo J. View northeast of off-site pond fringe Wetland UW02 (UP03).

Photo K. View south of off-site pond fringe Wetland UW03 (UP05).

Photo L. View south of side seep from eastern pond feeding into drainage ditch.

Photo M. View east of side seep drainage ditch.

Photo N. View west of upland stream terrace near the middle of the site (UP07).

Photo O. View east of upland stream terrace in the eastern portion of the site (UP08).

Photo P. View east of upland in slight depression just west of McCarl Creek (UP09).

APPENDIX E: ECOLOGY RATING FORMS

Wetland name or number UW01

RATING SUMMARY – Eastern Washington

Name of wetland (or ID #): UW01 Date of site visit: 4/6/17

Rated by N. Evan Dulin Trained by Ecology? ✓ Yes ___ No Date of training 3/24/17

HGM Class used for rating Depressional Wetland has multiple HGM classes? ___ Y ✓ N

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

OVERALL WETLAND CATEGORY III (based on functions ✓ or special characteristics ___)

1. Category of wetland based on FUNCTIONS

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

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

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

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

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	Circle the appropriate ratings			
Site Potential	H (M) L	(H) M L	H (M) L	
Landscape Potential	(H) M L	(H) M L	H M (L)	
Value	H M (L)	H (M) L	H M (L)	TOTAL
Score Based on Ratings	6	8	4	18

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

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

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY *Circle the appropriate category*
Vernal Pools	II III
Alkali	I
Wetland of High Conservation Value	I
Bog and Calcareous Fens	I
Old Growth or Mature Forest – slow growing	I
Aspen Forest	I
Old Growth or Mature Forest – fast growing	II
Floodplain forest	II
None of the above	✓

Wetland name or number UW01

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	N/A – no outlet
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	1
Map of the contributing basin	D 5.3	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	3
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	4
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	D 3.3	5

Riverine Wetlands

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

Lake Fringe Wetlands

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

Slope Wetlands

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

Wetland name or number UW01

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.

Wetland name or number UWo 1

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

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

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

Wetland name or number UW01

DEPRESSIONAL WETLANDS **Water Quality Functions** - Indicators that the site functions to improve water quality	Points (only 1 score per box)
D 1.0. Does the site have the potential to improve water quality?	
D 1.1. Characteristics of surface water outflows from the wetland: — Wetland has no surface water outlet — points = 5 Wetland has an intermittently flowing outlet — points = 3 Wetland has a highly constricted permanently flowing outlet — points = 3 Wetland has a permanently flowing, unconstricted, surface outlet — points = 1	5
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 (100% ungrazed) — points = 5 Wetland has persistent, ungrazed, vegetation from 1/3 to 2/3 of area — points = 3 Wetland has persistent, ungrazed vegetation from 1/10 to < 1/3 of area — points = 1 Wetland has persistent, ungrazed vegetation < 1/10 of area — points = 0	5
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 — Area seasonally ponded is ¼ - ½ total area of wetland (27%) — points = 1 Area seasonally ponded is < ¼ total area of wetland — points = 0	1
Total for D 1 — Add the points in the boxes above	11

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? (fed by roadside ditch) (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? (potentially) (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? Source_____ Yes = 1 (No = 0)	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)	0
Total for D 3 — 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 UW61

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")*	8
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	14

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

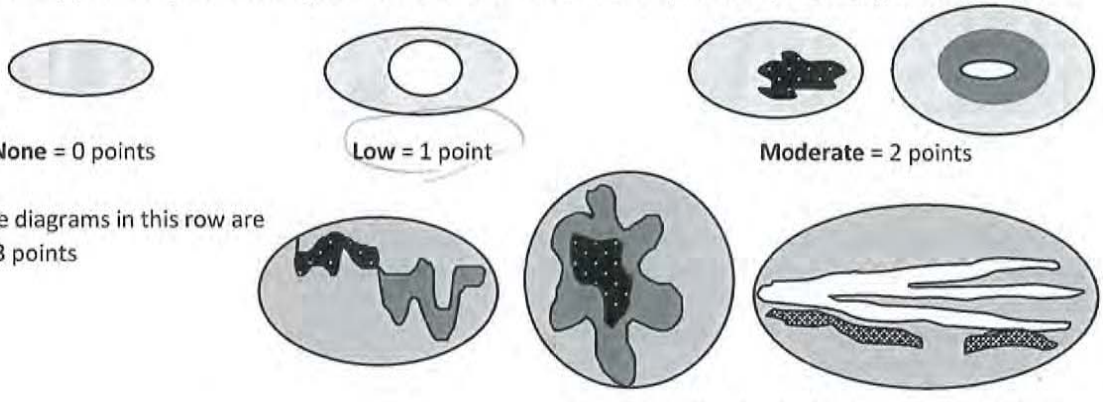
D 5.0. Does the landscape have the potential to support the hydrologic functions of the site?		
D 5.1. Does the wetland receive stormwater discharges? fed by roadside ditch	(Yes = 1) No = 0	1
D 5.2. Is > 10% of the area within 150 ft of the wetland in a land use that generates runoff? 16%	(Yes = 1) No = 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	1
Total for D 5	Add the points in the boxes above	3

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 Yakima River — points = 1 The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. *Explain why* _____ — points = 0 There are no problems with flooding downstream of the wetland — points = 0	1
D 6.2. Has the site has been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 (No = 0)	0
Total for D 6 — Add the points in the boxes above	1

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

Wetland name or number UW01

These questions apply to wetlands of all HGM classes. **HABITAT FUNCTIONS** - Indicators that site functions to provide important habitat	(only 1 score per box)
H 1.0. Does the wetland have the potential to provide habitat for many species?	
H 1.1. Structure of the plant community: *Check the Cowardin vegetation classes present and categories of emergent plants. Size threshold for each category is >= ¼ ac or >= 10% of the wetland if wetland is < 2.5 ac.* ✓ Aquatic bed 27% ___ 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 the rest (73%) ___ 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	1
H 1.2. Is one of the vegetation types Aquatic Bed? (Yes = 1) No = 0	1
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.* 27% (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 2 Scoring: > 9 species: points = 2 4-9 species: points = 1 < 4 species: points = 0	0
H 1.5. Interspersion of habitats Decide from the diagrams below whether interspersion among types of plant structures (described in H 1.1), and unvegetated areas (open water or mudflats) is high, moderate, low, or none. *Use map of Cowardin and emergent plant classes prepared for questions H 1.1 and map of open water from H 1.3. If you have four or more plant classes or three classes and open water, the rating is always high.*  **None** = 0 points **Low** = 1 point **Moderate** = 2 points All three diagrams in this row are **High** = 3 points Riparian braided channels with 2 classes	Figure 1

Wetland name or number UW01

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)*	1
Total for H 1 — Add the points in the boxes above	7

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:* % undisturbed habitat 0 + [(% moderate and low intensity land uses)/2] 0 = 0 % > 1/3 (33.3%) of 1 km Polygon — points = 3 20-33% of 1km Polygon — points = 2 10-19% of 1km Polygon — points = 1 ✓ <10% of 1km Polygon — points = 0	0
H 2.2. Undisturbed habitat in 1 km Polygon around wetland. (5+ patches) *Calculate:* % undisturbed habitat 13 + [(% moderate and low intensity land uses)/2] 15.5 = 28.5 % 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 Polygon — points = 0 undis 100/790 ac = 13%; 248/790 ac = 31%	1
H 2.3. Land use intensity in 1 km Polygon: > 50% of Polygon is high intensity land use 56% — points = (- 2) Does not meet criterion above — points = 0	-2
H 2.4. The wetland is in an area where annual rainfall is less than 12 in, and its water regime is not influenced by irrigation practices, dams, or water control structures. *Generally, this means outside boundaries of reclamation areas, irrigation districts, or reservoirs* — Yes = 3 (No = 0)	0
Total for H 2 — Add the points in the boxes above	-1

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 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	0

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

Appendix B: WDFW Priority Habitats in Eastern Washington

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

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

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

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

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

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

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

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

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

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

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

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

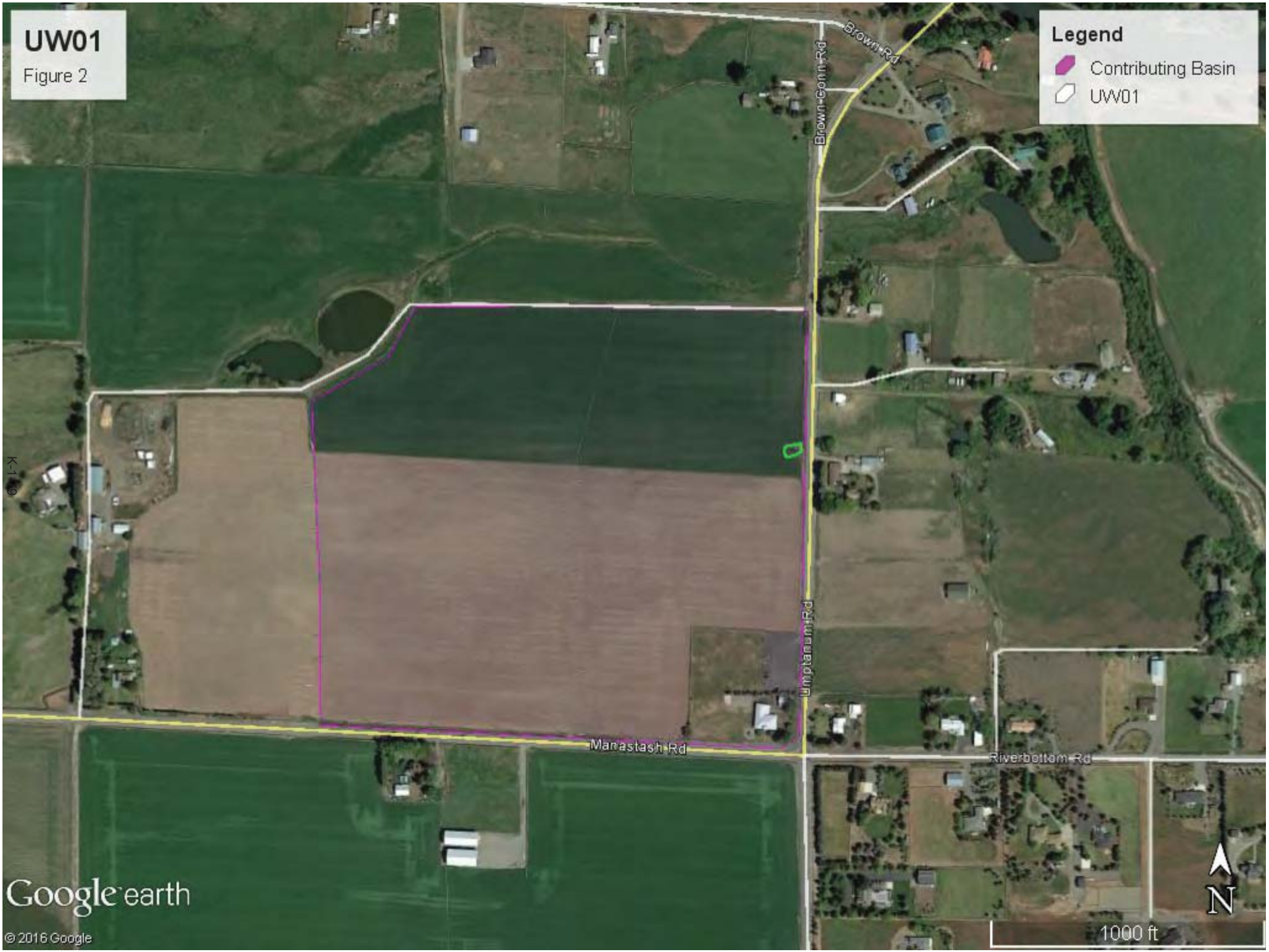
— **Shrub-steppe:** A nonforested vegetation type consisting of one or more layers of perennial bunchgrasses and a conspicuous but discontinuous layer of shrubs (see Eastside Steppe for sites with little or no shrub cover).

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

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

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

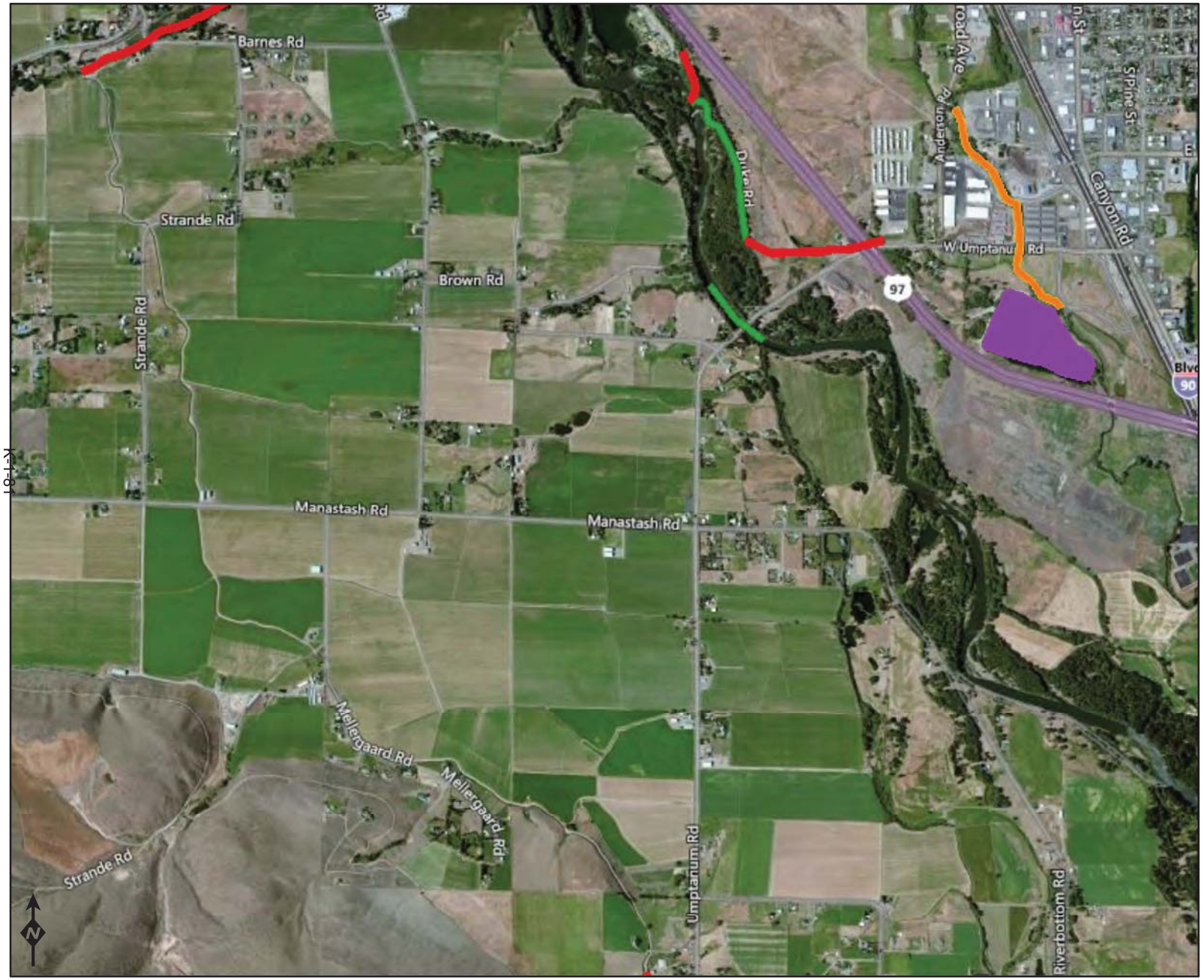

UW01
Figure 1
Legend
Seasonally ponded / Aquatic bed
UW01
K-1-78
Google earth
© 2016 Google
N
200 ft


UW01
Figure 2
Legend
Contributing Basin
UW01
Brown Rd
Brown-Conn Rd
Improvement Rd
Manastash Rd
Riverbottom Rd
K-1
N
1000 ft
Google earth
© 2016 Google


UW01
Figure 3
Legend
Mid-intensity
UW01
Undisturbed
Roadrunner Ln
Brown Rd
Anderson Rd
97
K-1-80
Brondt Rd
Umptanum Rd
Manastash Rd
Riverbottom Rd
Google earth
© 2016 Google
N
3000 ft

April 27, 2017

UW01 - Figure 4



Assessed Waters/Sediment

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

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

K-1-81

Image courtesy of USGS Earthstar Geographics SIO © 2017 Microsoft Corporation © 2010 NAVTEQ © AND

Miles
0 0.25 0.5 1

DEPARTMENT OF ECOLOGY
State of Washington

Water Quality Improvement Projects (TMDLs)

WATER QUALITY IMPROVEMENT PROJECTS (TMDLs)

Overview of the process
Project Catalog
by WRIA
by County
Funding Opportunities
Project Development Priority Lists
Related Information
TMDL Contacts

RELATED ECOLOGY PROGRAMS

Water Quality

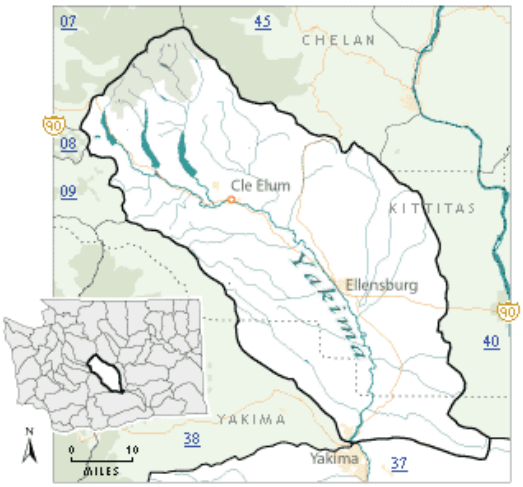
Water Quality Improvement > Water Quality Improvement Projects by WRIA > WRIA 39: Upper Yakima

WRIA 39: Upper Yakima

The following table lists overview information and links to specific water quality improvement projects (including total maximum daily loads, or TMDLs) for this water resource inventory area (WRIA). Please use links (where available) for more information on a project.

Yakima River basin project index:
www.ecy.wa.gov/programs/wq/tmdl/yakima_wq/index.html
Counties

- Kittitas
- Yakima



Project Name	Pollutants	Status**	TMDL Lead
Crystal Creek	Ammonia-N BOD (5-day) Chlorine Fecal Coliform	EPA approved	Jane Creech 509-454-7860
Selah Ditch	Fecal Coliform Temperature	EPA approved	Greg Bohn 509-454-4174
Teanaway River segments: • Upper West Fork Teanaway River • Upper Middle Fork Teanaway River • Upper North Fork Teanaway River • Stafford Creek • Lower West Fork Teanaway River • Lower Middle Fork Teanaway River • Lower North Fork Teanaway River • Mainstem Teanaway River	Temperature	EPA approved	Jane Creech 509-454-7860
Wilson/Cooke Creek Tributaries: • Badger Creek • Bull Ditch • Caribou Creek • Cherry Creek • CID Canal • Coleman Creek • Cook Creek • EWC Canal • Johnson Drain • KRD Canal	Fecal Coliform	EPA approved Has an implementation plan Post-TMDL monitoring report	Jane Creech 509-454-7860 Greg Bohn 509-454-4174

Mercer Creek • Naneum Creek • Parke Creek • Whiskey Creek • Wilson Creek • Wipple Wasteway			
Yakima River, Upper	Dieldrin DDT Suspended Sediments Turbidity	EPA approved	Jane Creech 509-454-7860
	Temperature	EPA approved Has an implementation plan	Jane Creech 509-454-7860
Yakima River	Toxics	Under development	Jane Creech 509-454-7860

**** Status** will be listed as one of the following: Approved by EPA, Under Development or Implementation. No status means project work has not yet started.*

For more information about WRIA 39:

- Waterbodies in WRIA 39 - using the Water Quality Assessment Query Tool
- Watershed Information for WRIA 39

* The Department of Ecology and other state resource agencies frequently use a system of 62 "Water Resource Inventory Areas" or "WRIAs" to refer to the state's major watershed basins.

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Last updated December 2016

Wetland name or number UW02

RATING SUMMARY – Eastern Washington

Name of wetland (or ID #): UW02 Date of site visit: 4/7/17

Rated by N. Evan Dulin Trained by Ecology? ✓ Yes ___ No Date of training 3/24/17

HGM Class used for rating Depressional Wetland has multiple HGM classes? ___Y ✓N

NOTE: Form is not complete without the figures requested (*figures can be combined*).

Source of base aerial photo/map Google Earth

OVERALL WETLAND CATEGORY III (based on functions ✓ or special characteristics ___)

1. Category of wetland based on FUNCTIONS

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

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

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

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

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	Circle the appropriate ratings			
Site Potential	H M (L)	(H) M L	H (M) L	
Landscape Potential	H (M) L	H (M) L	H M (L)	
Value	H (M) L	H (M) L	H (M) L	TOTAL
Score Based on Ratings	5	7	5	17

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

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

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY *Circle the appropriate category*
Vernal Pools	II III
Alkali	I
Wetland of High Conservation Value	I
Bog and Calcareous Fens	I
Old Growth or Mature Forest – slow growing	I
Aspen Forest	I
Old Growth or Mature Forest – fast growing	II
Floodplain forest	II
None of the above	✓

Wetland name or number UW02

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	1
Map of the contributing basin	D 5.3	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	3
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	4
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	D 3.3	5

Riverine Wetlands

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

Lake Fringe Wetlands

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

Slope Wetlands

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

Wetland name or number UW02

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.

Wetland name or number UW02

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

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

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

Wetland name or number UW02

DEPRESSIONAL WETLANDS **Water Quality Functions** - Indicators that the site functions to improve water quality	Points (only 1 score per box)
D 1.0. Does the site have the potential to improve water quality?	
D 1.1. Characteristics of surface water outflows from the wetland: Wetland has no surface water outlet — points = 5 Wetland has an intermittently flowing outlet — points = 3 — Wetland has a highly constricted permanently flowing outlet — points = 3 Wetland has a permanently flowing, unconstricted, surface outlet — points = 1	3
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic *(use NRCS definitions of soils)* YES = 3 (NO = 0)	0
D 1.3. Characteristics of persistent vegetation (Emergent, Scrub-shrub, and/or Forested Cowardin classes) Wetland has persistent, ungrazed, vegetation for > $^2/_3$ of area — points = 5 Wetland has persistent, ungrazed, vegetation from $^1/_3$ to $^2/_3$ of area — points = 3 — Wetland has persistent, ungrazed vegetation from $^1/_{10}$ to < $^1/_3$ of area 10% — points = 1 Wetland has persistent, ungrazed vegetation < $^1/_{10}$ of area — points = 0	1
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 Area seasonally ponded is ¼ - ½ total area of wetland — points = 1 — Area seasonally ponded is < ¼ total area of wetland 10% — points = 0	0
Total for D 1 — Add the points in the boxes above	4

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)	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? Yakima River within 1 mile (Yes = 1) No = 0	1
D 3.2. Is the wetland in a basin or sub-basin where water quality is an issue in some aquatic resource [303(d) list, eutrophic lakes, problems with nuisance and toxic algae]? Yes = 1 (No = 0)	0
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality (*answer YES if there is a TMDL for the drainage or basin in which the wetland is found*)? Yes = 2 (No = 0)	0
Total for D 3 — Add the points in the boxes above	1

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

Wetland name or number GW02

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*

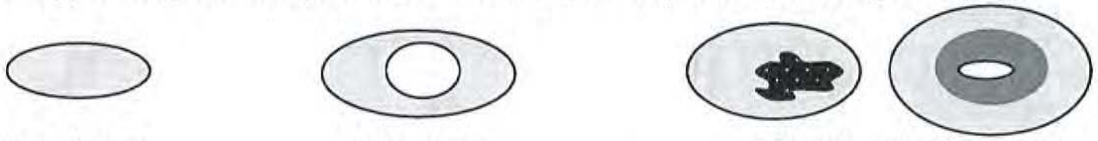
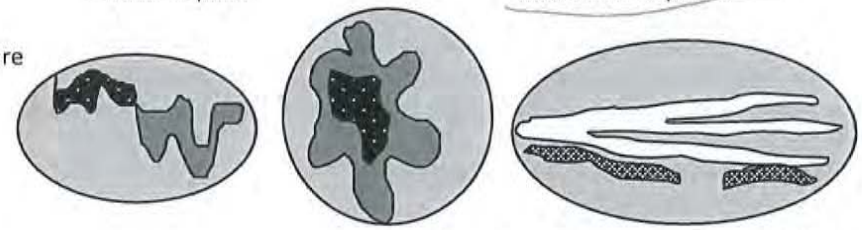
D 5.0. Does the landscape have the potential to support the hydrologic functions of the site?	
D 5.1. Does the wetland receive stormwater discharges? Yes = 1 (No = 0)	0
D 5.2. Is > 10% of the area within 150 ft of the wetland in a land use that generates runoff? Yes = 1 (No = 0)	0
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses? (Yes = 1) No = 0	1
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. *Explain why* _____ — points = 0 There are no problems with flooding downstream of the wetland — points = 0	1
D 6.2. Has the site has been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 (No = 0)	0
Total for D 6 — Add the points in the boxes above	1

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

Wetland name or number WW02

These questions apply to wetlands of all HGM classes. **HABITAT FUNCTIONS** - Indicators that site functions to provide important habitat	(only 1 score per box)
H 1.0. Does the wetland have the potential to provide habitat for many species?	
H 1.1. Structure of the plant community: *Check the Cowardin vegetation classes present and categories of emergent plants. Size threshold for each category is >= ¼ ac or >= 10% of the wetland if wetland is < 2.5 ac.* ✓ Aquatic bed ~ 10% ___ 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 5% ✓ Emergent plants > 40 in (> 100 cm) high are the highest layer with >30% cover ~10 % ___ Scrub-shrub (areas where shrubs have >30% cover) ___ Forested (areas where trees have >30% cover) 6% 4 or more checks: points = 3 3 checks: points = 2 2 checks: points = 1 1 check: points = 0	1
H 1.2. Is one of the vegetation types Aquatic Bed? Yes = 1 No = 0	1
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 ____ RCG, RHACRI, TYPLAT, ~3 rd, + trees Scoring: > 9 species: points = 2 4-9 species: points = 1 < 4 species: points = 0	1
H 1.5. Interspersion of habitats Decide from the diagrams below whether interspersion among types of plant structures (described in H 1.1), and unvegetated areas (open water or mudflats) is high, moderate, low, or none. *Use map of Cowardin and emergent plant classes prepared for questions H 1.1 and map of open water from H 1.3. If you have four or more plant classes or three classes and open water, the rating is always high.*  **None** = 0 points **Low** = 1 point **Moderate** = 2 points All three diagrams in this row are **High** = 3 points  Riparian braided channels with 2 classes	Figure__ 2

Wetland name or number UW02

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)*	4
Total for H 1 — Add the points in the boxes above	12

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:* % undisturbed habitat 0 + [(% moderate and low intensity land uses)/2] 0 = 0 % > 1/3 (33.3%) of 1 km Polygon — points = 3 20-33% of 1km Polygon — points = 2 10-19% of 1km Polygon — points = 1 — <10% of 1km Polygon — points = 0	0
H 2.2. Undisturbed habitat in 1 km Polygon around wetland. (5+ patches) *Calculate:* % undisturbed habitat 3 + [(% moderate and low intensity land uses)/2] 15.5 = 18.5 % 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 Polygon — points = 0 undis 26/850 ac = 3% mod 267/850 ac = 31%	1
H 2.3. Land use intensity in 1 km Polygon: > 50% of Polygon is high intensity land use 66% — points = (- 2) Does not meet criterion above — points = 0	-2
H 2.4. The wetland is in an area where annual rainfall is less than 12 in, and its water regime is not influenced by irrigation practices, dams, or water control structures. *Generally, this means outside boundaries of reclamation areas, irrigation districts, or reservoirs* — Yes = 3 (No = 0)	0
Total for H 2 — Add the points in the boxes above	-1

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 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*

Appendix B: WDFW Priority Habitats in Eastern Washington

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

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

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

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

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

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

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

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

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

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

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

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

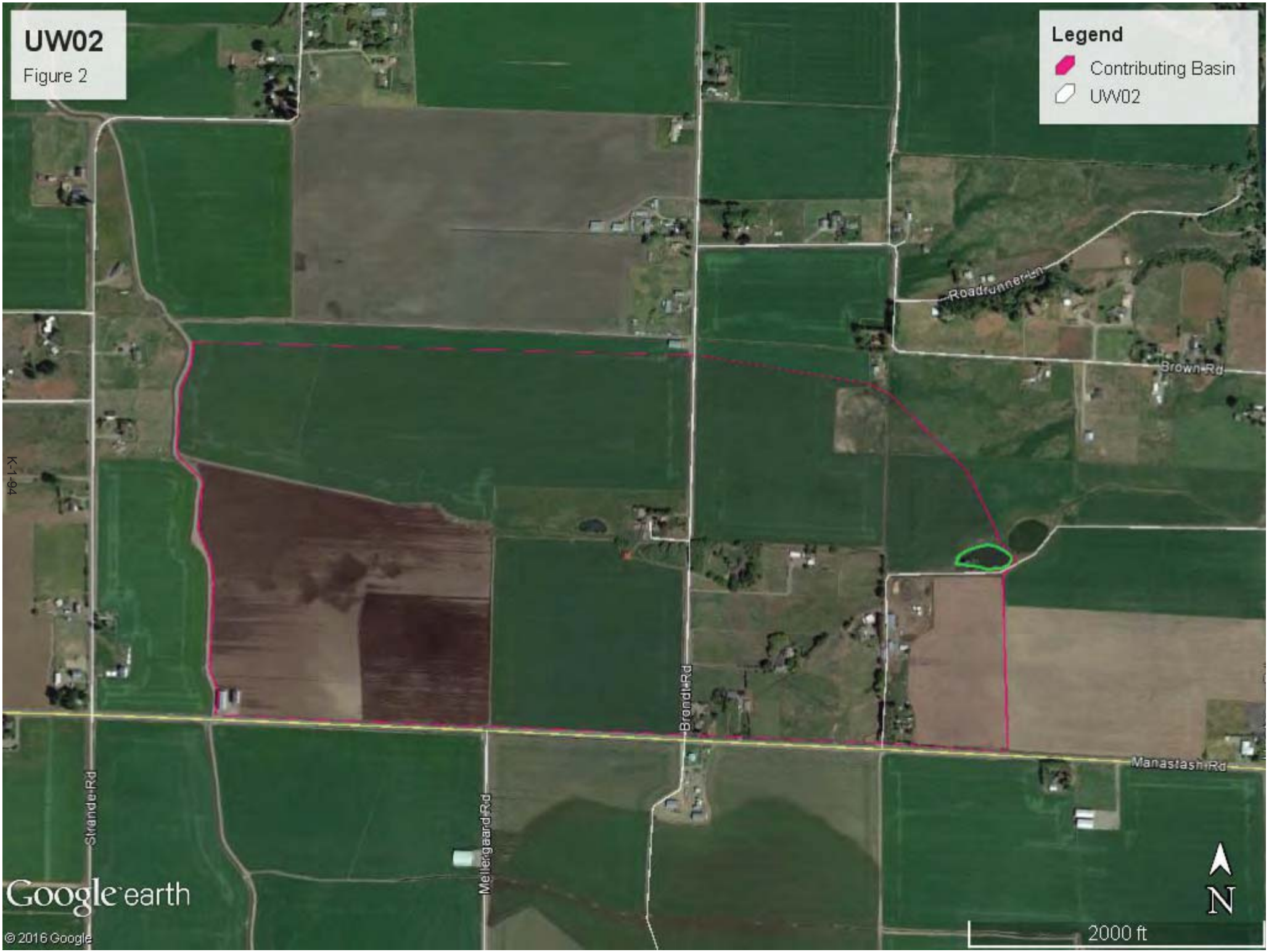
— **Shrub-steppe:** A nonforested vegetation type consisting of one or more layers of perennial bunchgrasses and a conspicuous but discontinuous layer of shrubs (see Eastside Steppe for sites with little or no shrub cover).

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

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

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


UW02
Figure 1
Legend
Emergent (12-40")
Emergent (>40")
Forested
Outlet
Permanently ponded
Seasonally Ponded/Aquatic Bed
UW02
Outlet
K-1-93
Google earth
© 2016 Google
N
200 ft


UW02
Figure 2
Legend
Contributing Basin
UW02
Roadrunner Ln
Brown Rd
K-1-94
Brondi Rd
Manastash Rd
Strande Rd
Mellergaard Rd
Google earth
© 2016 Google
N
2000 ft


UW02
Figure 3
Legend
Mid-intensity
UW02
Undisturbed
Roadrunner Ln
Brown Rd
Brondi Rd
Umptanum Rd
Manastash Rd
Mellergaard Rd
K-1-95
90
Google earth
© 2016 Google
N
3000 ft

April 27, 2017

UW02 - Figure 4

Assessed Waters/Sediment

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

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

Miles
0 0.25 0.5 1

DEPARTMENT OF ECOLOGY
State of Washington

Water Quality Improvement Projects (TMDLs)

WATER QUALITY IMPROVEMENT PROJECTS (TMDLs)

Overview of the process

Project Catalog

- by WRIA
- by County

Funding Opportunities

Project Development Priority Lists

Related Information

TMDL Contacts

RELATED ECOLOGY PROGRAMS

Water Quality

Water Quality Improvement > Water Quality Improvement Projects by WRIA > WRIA 39: Upper Yakima

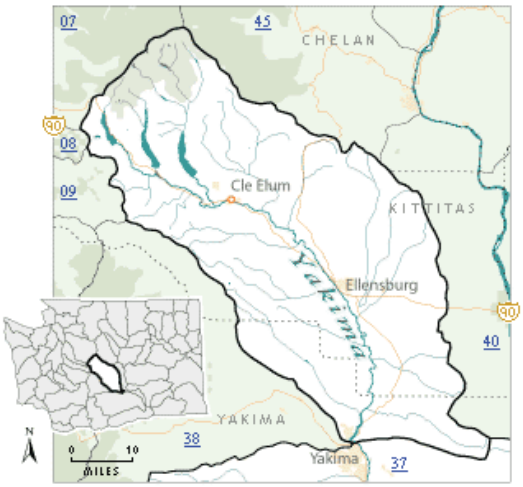
WRIA 39: Upper Yakima

The following table lists overview information and links to specific water quality improvement projects (including total maximum daily loads, or TMDLs) for this water resource inventory area (WRIA). Please use links (where available) for more information on a project.

Yakima River basin project index:
www.ecy.wa.gov/programs/wq/tmdl/yakima_wq/index.html

Counties

- Kittitas
- Yakima



Project Name	Pollutants	Status**	TMDL Lead
Crystal Creek	Ammonia-N BOD (5-day) Chlorine Fecal Coliform	EPA approved	Jane Creech 509-454-7860
Selah Ditch	Fecal Coliform Temperature	EPA approved	Greg Bohn 509-454-4174
Teanaway River segments: • Upper West Fork Teanaway River • Upper Middle Fork Teanaway River • Upper North Fork Teanaway River • Stafford Creek • Lower West Fork Teanaway River • Lower Middle Fork Teanaway River • Lower North Fork Teanaway River • Mainstem Teanaway River	Temperature	EPA approved	Jane Creech 509-454-7860
Wilson/Cooke Creek Tributaries: • Badger Creek • Bull Ditch • Caribou Creek • Cherry Creek • CID Canal • Coleman Creek • Cook Creek • EWC Canal • Johnson Drain • KRD Canal	Fecal Coliform	EPA approved Has an implementation plan Post-TMDL monitoring report	Jane Creech 509-454-7860 Greg Bohn 509-454-4174

Mercer Creek • Naneum Creek • Parke Creek • Whiskey Creek • Wilson Creek • Wipple Wasteway			
Yakima River, Upper	Dieldrin DDT Suspended Sediments Turbidity	EPA approved	Jane Creech 509-454-7860
	Temperature	EPA approved Has an implementation plan	Jane Creech 509-454-7860
Yakima River	Toxics	Under development	Jane Creech 509-454-7860

**** Status** will be listed as one of the following: Approved by EPA, Under Development or Implementation. No status means project work has not yet started.*

For more information about WRIA 39:

- Waterbodies in WRIA 39 - using the Water Quality Assessment Query Tool
- Watershed Information for WRIA 39

* The Department of Ecology and other state resource agencies frequently use a system of 62 "Water Resource Inventory Areas" or "WRIAs" to refer to the state's major watershed basins.

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Last updated December 2016

Wetland name or number UW03

RATING SUMMARY – Eastern Washington

Name of wetland (or ID #): UW03 Date of site visit: 4/7/17

Rated by N. Evan Dulin Trained by Ecology? ✓ Yes ___ No Date of training 3/24/17

HGM Class used for rating Depressional Wetland has multiple HGM classes? ___Y ✓N

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

OVERALL WETLAND CATEGORY III (based on functions ✓ or special characteristics ___)

1. Category of wetland based on FUNCTIONS

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

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

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

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

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	Circle the appropriate ratings			
Site Potential	H M (L)	(H) M L	H (M) L	
Landscape Potential	H (M) L	H (M) L	H M (L)	
Value	H (M) L	H (M) L	H (M) L	TOTAL
Score Based on Ratings	5	7	5	17

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

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

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY *Circle the appropriate category*
Vernal Pools	II III
Alkali	I
Wetland of High Conservation Value	I
Bog and Calcareous Fens	I
Old Growth or Mature Forest – slow growing	I
Aspen Forest	I
Old Growth or Mature Forest – fast growing	II
Floodplain forest	II
None of the above	✓

Wetland name or number 1W03

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	1
Map of the contributing basin	D 5.3	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	3
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	4
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	D 3.3	5

Riverine Wetlands

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

Lake Fringe Wetlands

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

Slope Wetlands

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

Wetland name or number UW03

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.

Wetland name or number UW03

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

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

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

Wetland name or number UW03

DEPRESSIONAL WETLANDS **Water Quality Functions** - Indicators that the site functions to improve water quality	Points (only 1 score per box)
D 1.0. Does the site have the potential to improve water quality?	
D 1.1. Characteristics of surface water outflows from the wetland: Wetland has no surface water outlet — points = 5 Wetland has an intermittently flowing outlet — points = 3 — Wetland has a highly constricted permanently flowing outlet — points = 3 Wetland has a permanently flowing, unconstricted, surface outlet — points = 1	3
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic *(use NRCS definitions of soils)* YES = 3 (NO = 0)	0
D 1.3. Characteristics of persistent vegetation (Emergent, Scrub-shrub, and/or Forested Cowardin classes) Wetland has persistent, ungrazed, vegetation for > $^2/_3$ of area — points = 5 Wetland has persistent, ungrazed, vegetation from $^1/_3$ to $^2/_3$ of area — points = 3 — Wetland has persistent, ungrazed vegetation from $^1/_{10}$ to < $^1/_3$ of area 14% — points = 1 Wetland has persistent, ungrazed vegetation < $^1/_{10}$ of area — points = 0	1
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 Area seasonally ponded is ¼ - ½ total area of wetland — points = 1 — Area seasonally ponded is < ¼ total area of wetland 18% — points = 0	0
Total for D 1 — Add the points in the boxes above	4

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)	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? Yakima River within 1 mile (Yes = 1) No = 0	1
D 3.2. Is the wetland in a basin or sub-basin where water quality is an issue in some aquatic resource [303(d) list, eutrophic lakes, problems with nuisance and toxic algae]? Yes = 1 (No = 0)	0
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality (*answer YES if there is a TMDL for the drainage or basin in which the wetland is found*)? Yes = 2 (No = 0)	0
Total for D 3 — Add the points in the boxes above	1

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

Wetland name or number UW03

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*

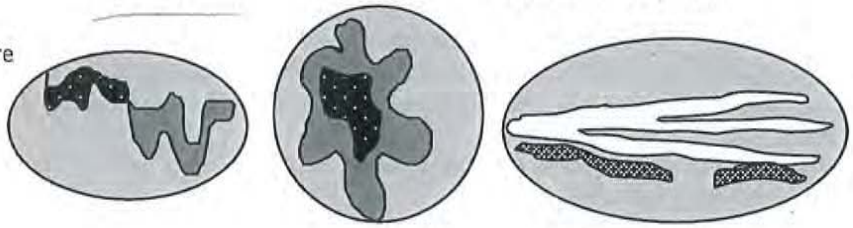
D 5.0. Does the landscape have the potential to support the hydrologic functions of the site?	
D 5.1. Does the wetland receive stormwater discharges? Yes = 1 (No = 0)	0
D 5.2. Is > 10% of the area within 150 ft of the wetland in a land use that generates runoff? Yes = 1 (No = 0)	0
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses? (Yes = 1) No = 0	1
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. *Explain why* _____ — points = 0 There are no problems with flooding downstream of the wetland — points = 0	1
D 6.2. Has the site has been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 (No = 0)	0
Total for D 6 — Add the points in the boxes above	1

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

Wetland name or number UW03

These questions apply to wetlands of all HGM classes. **HABITAT FUNCTIONS** - Indicators that site functions to provide important habitat	(only 1 score per box)
H 1.0. Does the wetland have the potential to provide habitat for many species?	
H 1.1. Structure of the plant community: *Check the Cowardin vegetation classes present and categories of emergent plants. Size threshold for each category is >= ¼ ac or >= 10% of the wetland if wetland is < 2.5 ac.* ✓ Aquatic bed 18% ___ 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 5% ✓ Emergent plants > 40 in (> 100 cm) high are the highest layer with >30% cover ~10% ___ Scrub-shrub (areas where shrubs have >30% cover) 4 or more checks: points = 3 ___ Forested (areas where trees have >30% cover) 3 checks: points = 2 2 checks: points = 1 1 check: points = 0	1
H 1.2. Is one of the vegetation types Aquatic Bed? (Yes = 1) No = 0	1
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 ____ Scoring: > 9 species: points = 2 4-9 species: points = 1 < 4 species: points = 0	1
H 1.5. Interspersion of habitats Decide from the diagrams below whether interspersion among types of plant structures (described in H 1.1), and unvegetated areas (open water or mudflats) is high, moderate, low, or none. *Use map of Cowardin and emergent plant classes prepared for questions H 1.1 and map of open water from H 1.3. If you have four or more plant classes or three classes and open water, the rating is always high.*  **None** = 0 points **Low** = 1 point **Moderate** = 2 points All three diagrams in this row are **High** = 3 points  Riparian braided channels with 2 classes	Figure__ 1

Wetland name or number UW03

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)*	4
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:* % undisturbed habitat 0 + [(% moderate and low intensity land uses)/2] 0 = 0 % > 1/3 (33.3%) of **1** km Polygon — points = 3 20-33% of 1km Polygon — points = 2 10-19% of 1km Polygon — points = 1 — <10% of 1km Polygon — points = 0	0
H 2.2. Undisturbed habitat in 1 km Polygon around wetland. (5+ patches) *Calculate:* % undisturbed habitat 5 + [(% moderate and low intensity land uses)/2] 16 = 21 % 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 Polygon — points = 0 undis 41/840 ac = 5%; mid 272/840 ac = 32%	1
H 2.3. Land use intensity in 1 km Polygon: > 50% of Polygon is high intensity land use 63% — points = (- 2) Does not meet criterion above — points = 0	-2
H 2.4. The wetland is in an area where annual rainfall is less than 12 in, and its water regime is not influenced by irrigation practices, dams, or water control structures. *Generally, this means outside boundaries of reclamation areas, irrigation districts, or reservoirs* — Yes = 3 (No = 0)	0
Total for H 2 — Add the points in the boxes above	-1

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 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*

Appendix B: WDFW Priority Habitats in Eastern Washington

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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


UW03
Figure 1
Legend
Emergent (12-40")
Emergent (>40")
Outlet
Permanently Ponded
Seasonally Ponded/Aquatic Bed
UW03
Outlet
K-1-108
Google earth
© 2016 Google
N
300 ft


UW03
Figure 2
Legend
Contributing Basin
UW03
Roadrunner Ln
Brow
K-1-109
Brandt Rd
Manasla
Strande Rd
Mallargaard Rd
Google earth
© 2016 Google
N
2000 ft


UW03
Figure 3
Legend
Mid-intensity
UW03
Undisturbed
Roadrunner Ln
Brown Rd
Brondt Rd
Manastash Rd
Umptanum Rd
River Bottom Rd
Mellergaard Rd
97
K-1-110
Google earth
© 2016 Google
N
3000 ft

April 27, 2017

UW03 - Figure 4

Assessed Waters/Sediment

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

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

Miles
0 0.25 0.5 1

DEPARTMENT OF ECOLOGY
State of Washington

Water Quality Improvement Projects (TMDLs)

WATER QUALITY IMPROVEMENT PROJECTS (TMDLs)

Overview of the process
Project Catalog
- by WRIA
- by County

Funding Opportunities
Project Development Priority Lists
Related Information
TMDL Contacts

RELATED ECOLOGY PROGRAMS

Water Quality

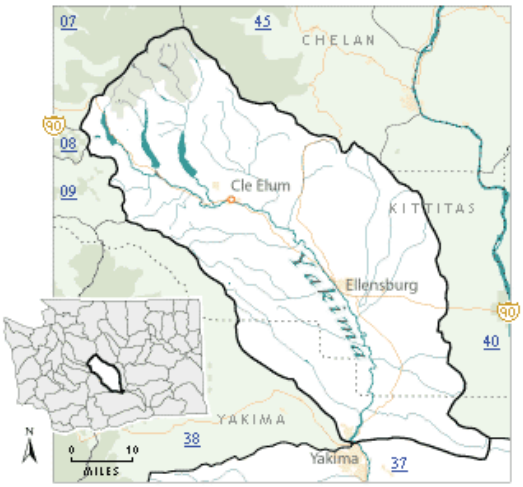
Water Quality Improvement > Water Quality Improvement Projects by WRIA > WRIA 39: Upper Yakima

WRIA 39: Upper Yakima

The following table lists overview information and links to specific water quality improvement projects (including total maximum daily loads, or TMDLs) for this water resource inventory area (WRIA). Please use links (where available) for more information on a project.

Yakima River basin project index:
www.ecy.wa.gov/programs/wq/tmdl/yakima_wq/index.html
Counties

- Kittitas
- Yakima



Project Name	Pollutants	Status**	TMDL Lead
Crystal Creek	Ammonia-N BOD (5-day) Chlorine Fecal Coliform	EPA approved	Jane Creech 509-454-7860
Selah Ditch	Fecal Coliform Temperature	EPA approved	Greg Bohn 509-454-4174
Teanaway River segments: • Upper West Fork Teanaway River • Upper Middle Fork Teanaway River • Upper North Fork Teanaway River • Stafford Creek • Lower West Fork Teanaway River • Lower Middle Fork Teanaway River • Lower North Fork Teanaway River • Mainstem Teanaway River	Temperature	EPA approved	Jane Creech 509-454-7860
Wilson/Cooke Creek Tributaries: • Badger Creek • Bull Ditch • Caribou Creek • Cherry Creek • CID Canal • Coleman Creek • Cook Creek • EWC Canal • Johnson Drain • KRD Canal	Fecal Coliform	EPA approved Has an implementation plan Post-TMDL monitoring report	Jane Creech 509-454-7860 Greg Bohn 509-454-4174

Mercer Creek • Naneum Creek • Parke Creek • Whiskey Creek • Wilson Creek • Wipple Wasteway			
Yakima River, Upper	Dieldrin DDT Suspended Sediments Turbidity	EPA approved	Jane Creech 509-454-7860
	Temperature	EPA approved Has an implementation plan	Jane Creech 509-454-7860
Yakima River	Toxics	Under development	Jane Creech 509-454-7860

**** Status** will be listed as one of the following: Approved by EPA, Under Development or Implementation. No status means project work has not yet started.*

For more information about WRIA 39:

- Waterbodies in WRIA 39 - using the Water Quality Assessment Query Tool
- Watershed Information for WRIA 39

* The Department of Ecology and other state resource agencies frequently use a system of 62 "Water Resource Inventory Areas" or "WRIAs" to refer to the state's major watershed basins.

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Last updated December 2016

APPENDIX F: KITTITAS COUNTY WETLAND BUFFER GUIDANCE

Chapter 17A.04
CRITICAL AREAS DESIGNATION AND DEVELOPMENT STANDARDS

Sections

17A.04.010 Wetlands.
Wetlands in Kittitas County are defined in Section 17A.02.310 and classified in four categories: Category I (extreme high value), Category II (high value), Category III (average value), Category IV (less than average value). Critical area wetlands in Kittitas County are defined as Category I, Category II, Category III and Category IV wetlands as determined by the planning manager.

Category IV wetlands may be determined by the director to constitute a critical area based upon application of the criteria in this chapter. (Ord. 95-15 (part), 1995; Ord. 94-22 (part), 1994).

17A.04.015 No net loss of wetland areas.
Kittitas County shall require, to the extent practical, and except for Category IV wetlands, a zero net loss of natural wetlands functions and values together with, if reasonably possible through voluntary agreements or government incentives, a gain of wetlands in the long term. (Ord. 94-22 (part), 1994).

17A.04.020 Buffer width requirements.
Wetland buffer requirements apply to all nonexempt activities on regulated wetlands. All wetland buffers shall be measured from the wetland boundary.

Category	Size of Wetland	Required Buffer
I	any size	50 - 200 feet
II	over 2,000 sq. ft.	25 - 100 feet
III	over 10,000 sq. ft.	20 - 80 feet
IV*	43,560 sq. ft. (1 acre)	Building setbacks will be determined by the zoning lot line setbacks, but shall not exceed 25 feet.

*Includes only nonirrigation induced or enhanced Category IV wetlands. Irrigation water does influence ground water table elevations in Kittitas County.

(Ord. 96-14 (part), 1996; Ord. 95-15 (part), 1995; Ord. 94-22 (part), 1994).

17A.04.025 Wetland buffer ranges.
The wetland buffer ranges have been established to reflect the impact of certain intense land uses on wetland function and values. The director shall base the buffer size on the following criteria and shall establish the least restrictive width of buffer necessary to account for all of the following considerations:

1. The overall intensity of the proposed use;
2. The presence of threatened, endangered, or sensitive species;
3. The site's susceptibility to severe erosion;
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. (Ord. 94-22 (part), 1994).

17A.04.030 Wetland buffer averaging.
Wetland buffers may be modified by averaging buffer widths. Wetland buffer width averaging shall be allowed only where the applicant demonstrates that the following exists:

1. That averaging is necessary to avoid an extraordinary hardship to the applicant caused by circumstances peculiar to the property;
2. That the wetland contains variations in sensitivity due to existing physical characteristics;
3. That the proposed use would be located adjacent to areas where buffer width is reduced, and that such land uses are low in impact;
4. That width averaging will not adversely impact wetland function and values. (Ord. 9422 (part), 1994).

17A.04.035 Natural condition of wetland buffer.
Natural condition of wetland buffer. Wetland buffer areas shall be retained in their natural condition or may be improved to enhance buffer functions and values. Where buffer disturbance has occurred during construction, revegetation with native vegetation may be required. The Kittitas County noxious weed ordinance shall be adhered to. (Ord. 94-22 (part), 1994).

17A.04.040 Allowed uses.
In addition to exempt activities otherwise identified herein, the following activities are allowed to occur on wetland and wetland buffer areas: nonmotorized outdoor recreational activities including hunting and fishing; educational activities; existing and ongoing agricultural activities, silviculture and mining; and maintenance of existing facilities, structures, ditches, roads, bridges and other utility systems. Up to two acres of Class IV wetlands may be filled, drained or modified with no approval required from the planning manager. If more than two acres of Class IV wetlands are filled, drained or modified, approval of the planning manager is required. Such development activity shall provide mitigation in accordance with Section 17A.04.050 for that portion of the wetland fill or modification that exceeds two acres. Category IV wetlands may be used for secondary stormwater management facilities having no reasonable alternative on-site location, provided there is no significant adverse impact to the functions and values of those wetlands. (Ord. 95-15 (part), 1995; Ord. 94-22 (part), 1994).

17A.04.045 Building setback lines from wetland buffers.
A building setback line equal to the side yard setback requirement of the applicable zoning district is required from the edge of any wetland buffer. Minor intrusions into the area of the building setback may be allowed if the director determines that such intrusions will not negatively impact the wetland. The setbacks shall be shown on all site plans submitted with the application. (Ord. 94-22 (part), 1994).

17A.04.050 Wetland replacement ratios.
Wetland replacement ratios are expressed in gross area required for replacement. The actual replacement, enhancement or rehabilitation of wetlands shall be determined by the director and meet all applicable standards for such. Replacement areas shall be determined according to function, acreage, type, location, time factors, ability to be self sustaining and projected success. Wetland functions and values shall be calculated using the Kittitas County critical areas policy document and the professional judgment of the director.

Category of Wetland	**Replacement Ratio**
I	3:1
II	2:1
III	1.5:1
IV	1:1 for the portion of a wetland fill or modification

(Ord. 96-14 (part), 1996; Ord. 95-15 (part), 1995; Ord. 94-22 (part), 1994).