WETLAND CRITICAL AREAS REPORT

Parcels 10847 and 664234

350 Bar 14 Road

Kittitas County, Washington

Prepared for:

James Ritter, Representative
for
William P. Woods Jr.
350 Bar 14 Rd | Ellensburg, WA 98926
206-949-9143 | jamesSritter@gmail.com

Prepared by:

GG Environmental, LLC
Geoffrey Gray, MA, PWS
151 Poulin Rd. Selah, WA 98942
gg@gg-env.com | (509) 426-5645

September 28, 2023

GG Environmental, LLC

WETLANDS • FISH • WILDLIFE

This page is purposefully blank.

Summary

From April 14 to September 28, 2023, Geoffrey Gray, MA, PWS (GG Environmental, LLC) completed a wetland critical areas investigation (including groundwater study) within Kittitas County (county) parcels 10847 and 664234, situs address 350 Bar 14 Rd, in unincorporated Kittitas County, Washington. The investigation included all uninterrupted[1] areas within a 250-foot (ft) radius ("study area") of a proposed residential access road (project).

Aerial imagery shows the study area to have been flood irrigated and grazed since at least 1954, although this practice likely began decades earlier when the Kittitas Reclamation District (KRD) North Branch Canal was completed nearby in 1933.

The study area is crossed by irrigation ditches, cross dikes and several grass-lined irrigation swales which direct surface flow down-gradient toward the south. Due to the location of the study area between Mercer and Wilson Creeks, in addition to relatively high groundwater mapped in the vicinity, flood irrigation was temporarily halted, and cattle removed, for several months to facilitate groundwater monitoring per guidance provided by the Department of Ecology.

Based on best available science, a single wetland was identified. Located within a topographically deep reach of a grass-lined irrigation swale, it is likely to be regulated by the county because the wetland is not *intentionally* created and elevated groundwater contributes to observed wetland hydrology, at least seasonally, for a minimum of 14 consecutive days.

Rated Category IV, the county assigns a regulatory wetland buffer of 40 feet (ft) (assuming land use with moderate impact)[2] plus a 15-ft building setback (total buffer radius = 55 ft).

The project will be designed and constructed to avoid the wetland, wetland buffer and building setback. As such, no wetland critical areas impacts are anticipated.

The adjacent parcel to the south may support wetlands, but access was not granted. As such, this report preliminarily identifies "*potential wetlands*" in this area.

[1] Consistent with CAO 17A.07.030.7 – *Interrupted buffer*.
[2] The Category IV wetland buffer ranges from 25 ft (low impact) to 50 ft (high impact).

Table of Contents

Figures

Appendices

Acronyms and Abbreviations

AgACIS	Agricultural Applied Climate Information System
CAO	Critical Areas Ordinance
Corps	United States Army Corps of Engineers
County	Kittitas County
DNR	Washington State Department of Natural Resources
Ecology	Washington State Department of Ecology
GIS	Geographic Information System
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
PWS	Professional Wetland Scientist
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WETS	Climate Analysis for Wetlands Tables
WGS84	World Geodetic System 1984

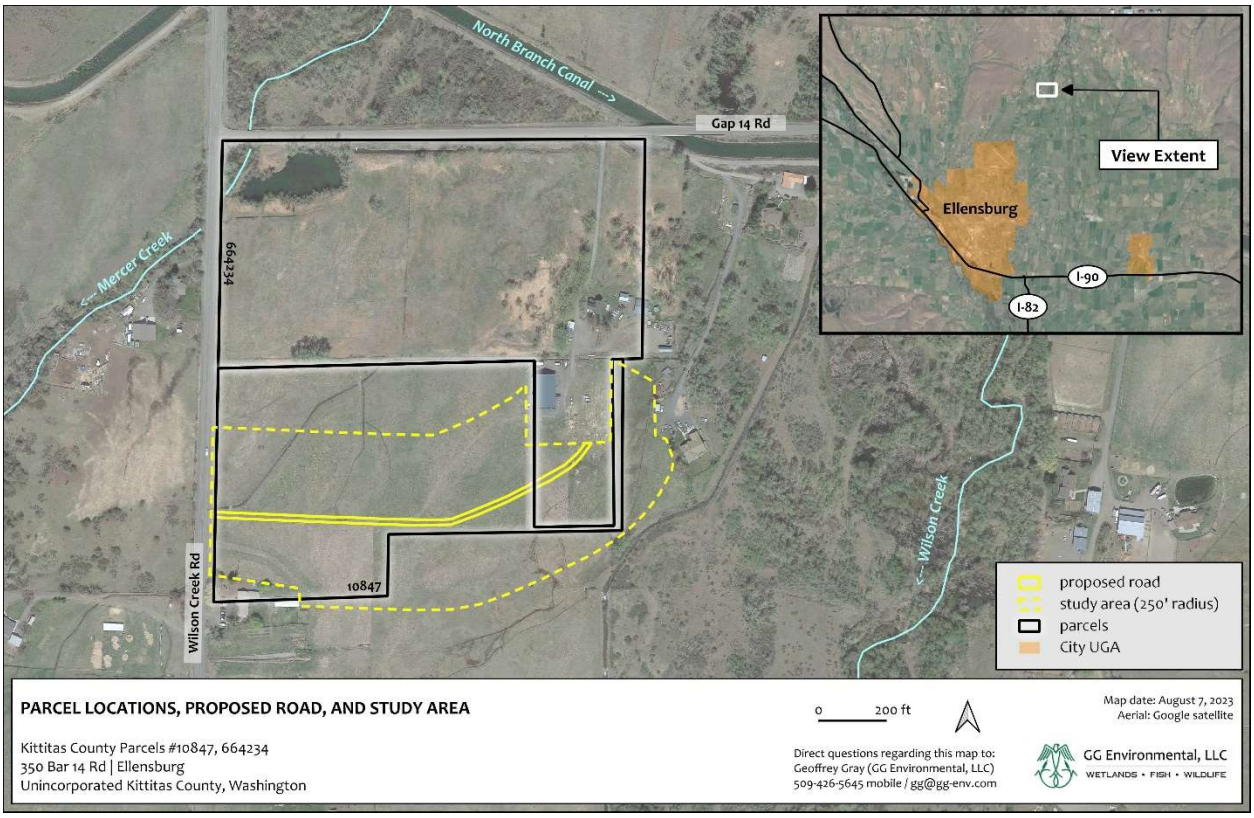
1. Introduction

GG Environmental, LLC (Geoffrey Gray, MA, PWS) was retained by Mr. James Ritter, Representative for Mr. William P. Woods, Jr. (Client), to complete a wetland critical areas investigation within adjacent parcels 10847 and 664234 (parcels) in unincorporated Kittitas County (county), Washington. The Client intends to construct a graveled access road (project) from Wilson Creek Road, across the parcels, to an existing residence.

2. Location

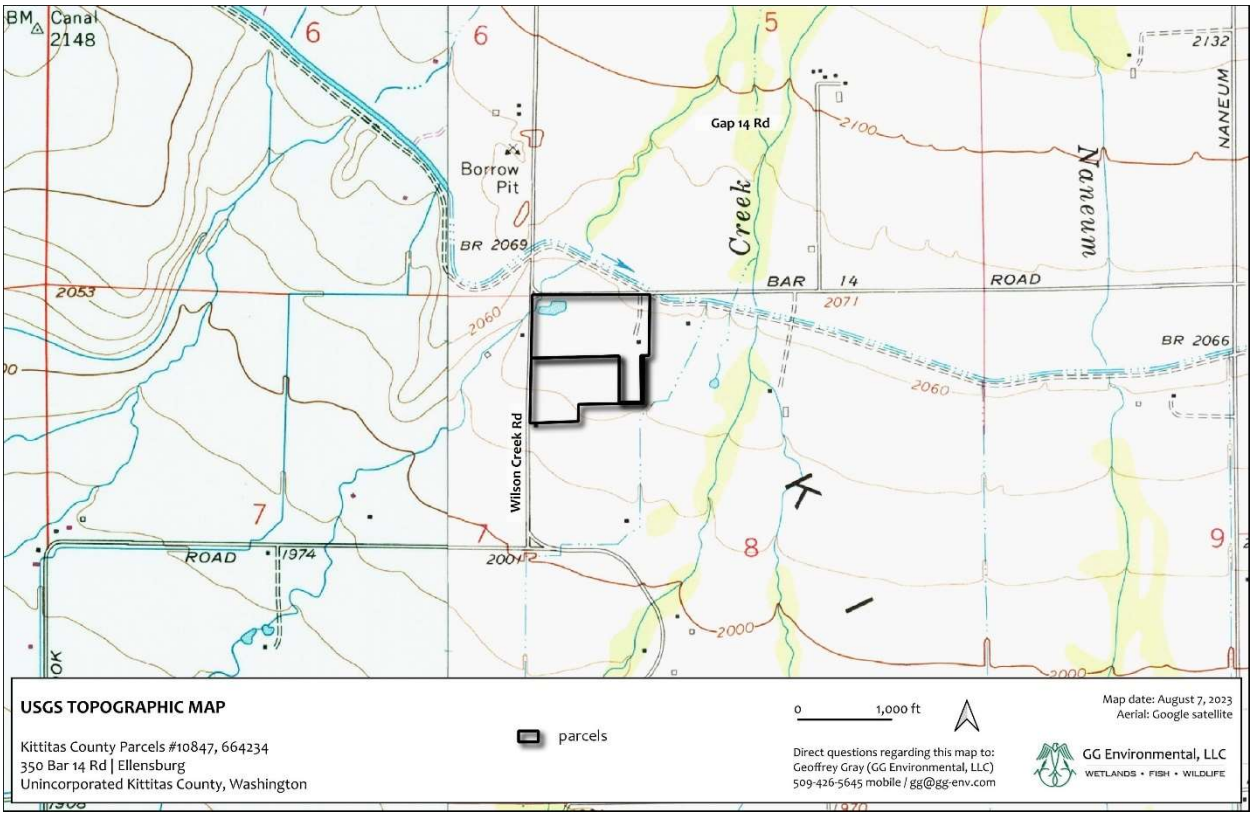
The project is located north of Ellensburg at 350 Bar 14 Road (**Figure 1**). Ranging in elevation from approximately 2,035 to 2,060 feet (ft), topography across the parcels is consistently sloped at approximately two percent toward the south-southwest (**Figure 2**). Positioned within the NW quarter of Section 8 in Township 18 North, Range 19 East, the approximate center of the study area is located at latitude 47° 4'13.24" North and longitude 120°29'43.64" West (WGS84).

Figure 1. Parcel Locations, Proposed Road, and Study Area



The study area occurs within United States Department of Agriculture (USDA) Land Resource Region B and USDA Major Land Resource Area 8 (Columbia Plateau) (NRCS 2006), Water Resource Inventory Area 39 (Upper Yakima), and Naneum Creek-Wilson Creek subwatershed (12th Hydrologic Unit Code 170300010408).

Figure 2. USGS Topographic Map



3. Methods

An overview of the methods employed to investigate wetlands is presented in this section.

3.1. Study Area

The study area includes all uninterrupted areas within a 250-ft radius from the proposed gravel road (project footprint) consistent with county Critical Areas Ordinance (CAO) Sections 17A.07.060(2)(a) – *Reporting/Contents* and 17A.07.030.7 – *Interrupted buffer* (Kittitas County 2023a).

Access to adjacent parcels was not granted. Therefore, the study area beyond the parcel limits was visually observed from within the parcel boundaries, complimented by a review of historic aerial imagery.

3.2. Background Research

Available data for the study area, including information on soils, topography, vegetation, precipitation, wetlands, historic aerial imagery, irrigation history and infrastructure, and the county code were researched:

- National Wetlands Inventory (NWI) (USFWS 2023a) (**Appendix A-1**);
- Kittitas County Code (Kittitas County 2023a);
- Kittitas County COMPAS (wetlands) (Kittitas County 2023b) (**Appendix A-1**);
- NRCS soil survey data (NRCS 2023a) (**Appendix A-2**);
- Historic aerial photography: 1954 (CWU 2023) and 1985-2023 (Google 2023);
- AgACIS climate data (NRCS 2023b). (**Appendix B**);

3.3. Field Investigation

Fieldwork was completed from April 14, 2023 to September 28, 2023 by GG Environmental, LLC (Geoffrey Gray, MA, PWS) with assistance from Mr. James Ritter who excavated 10 groundwater monitoring pits (GMP) in strategic locations identified by GG Environmental, LLC. The wetland delineation was performed on June 22. Groundwater was monitored every 14 days from April 14 to September 28.

3.4. Wetland Delineation Guidance, Regulatory Jurisdiction

The wetland investigation was performed in reference to routine methods described in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* (Corps 2008). Plants were identified by scientific name and wetland indicator status per Corps (2020).

Since the project occurs within unincorporated Kittitas County and is located outside shoreline jurisdiction, jurisdictional wetlands are regulated under county CAO Chapter 17A – *Critical Areas* (Kittitas County 2023a).

3.5. Geospatial Documentation

Features were geospatially surveyed with a Motorola G Stylus mobile phone, running the Mapit Spatial GIS application paired via Bluetooth® with a Juniper Systems Geode™ Multi-Global Navigation Satellite System (Multi-GNSS) receiver capable of sub-meter horizontal accuracy.

4. Existing Conditions

4.1. Topography

Occurring upon an alluvial fan laid down by adjacent Mercer and Wilson Creeks, topography within the study area is gently sloped approximately two percent toward the south-southwest. The vicinity has been managed for decades as flood-irrigated grazeland. Terrain variation includes several grass-lined swales.

4.2. Soils

One soil unit underlies the study area (NRCS 2023a) (**Appendix A-2**). **Brickmill-Naneum complex, 0 to 5 percent slopes**, is associated with alluvial fans. **Brickmill** is comprised of alluvium with an influence of volcanic ash in the surface, the typical profile ranges from gravelly ashy loam to extremely gravelly sandy loam in the upper 49 inches (in). It is somewhat poorly drained and exhibits a depth to water table of about 28 to 38 in because it lies over a restrictive feature from 40 to 60 in. It does not flood or pond and is not listed as a hydric soil. **Naneum** is comprised of alluvium with an influence of volcanic ash in the upper part, the typical profile ranges from ashy loam to very gravelly clay loam in the upper 35 in. It is somewhat poorly drained, with depth to a restrictive feature >80 in, and exhibits a depth to water table of about 21 to 28 in. It does not flood or pond and is not listed as a hydric soil. Minor components include **Nack** (5 percent) and **Opnish** (5 percent) neither of which is listed as a hydric soil.

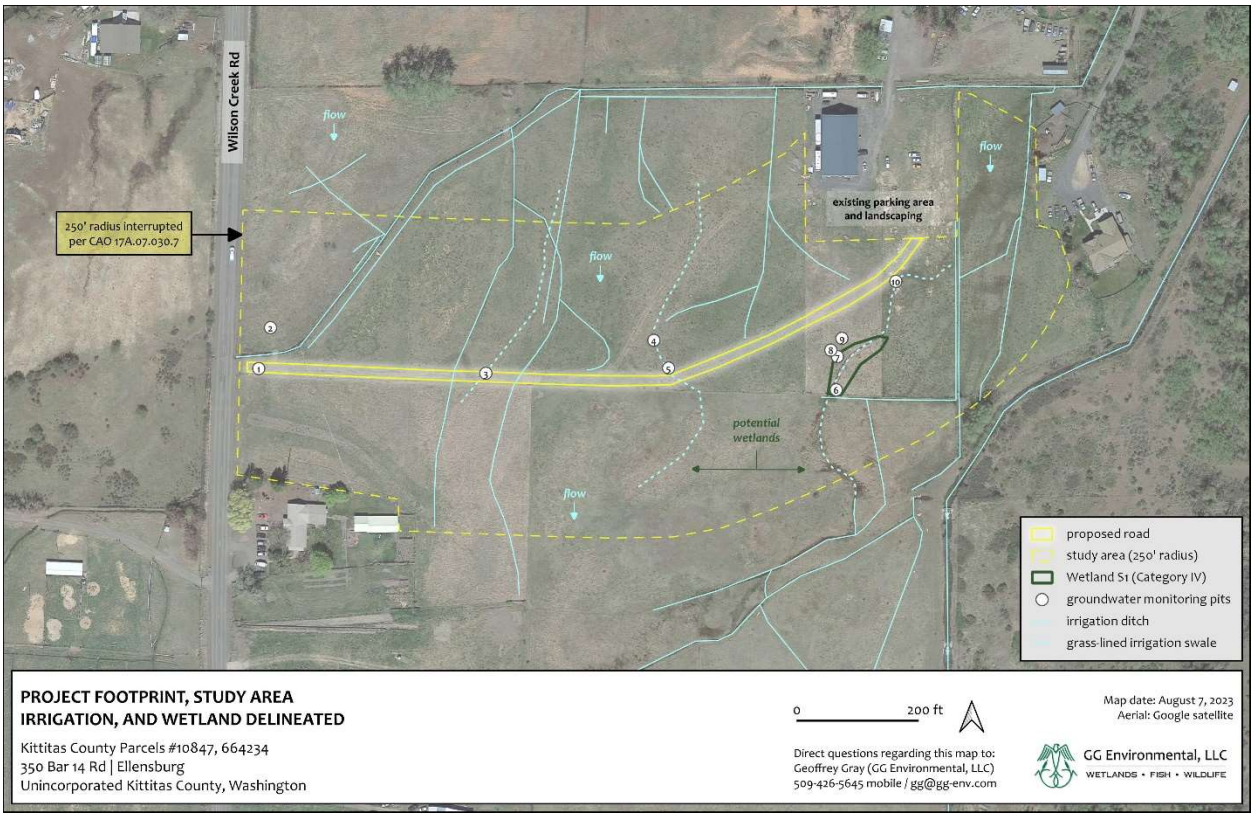
4.3. Irrigation

According to historic aerial imagery, the study area has been flood irrigated since at least 1954 (CWU 2023, Google 2023) although this practice likely began decades earlier when the North Branch Canal was completed in 1933 (Kittitas Reclamation District 2023). Irrigation surface water arrives from the north via an irrigation ditch (**Figure 3**) from which water is diverted across the study area through a network of lateral ditches, dikes, and grass-lined irrigation swales.

4.4. Water Table

Since the mapped soil complex (Naneum unit) is associated with relatively high groundwater, it was decided to monitor groundwater elevations via 10 excavated monitoring pits across the study area (**Figure 3**). These pits were strategically placed within and near depressions and swales where groundwater would, presumably, would be most shallow. Flood irrigation was stopped, and cattle removed, to facilitate groundwater monitoring and to better identify plants. Groundwater elevation was monitored every 14 days during the growing season (April 14 to September 28) consistent with guidance provided by the Department of Ecology (Ecology 2010).

Figure 3. Project Footprint, Study Area, Irrigation, and Wetland Delineated



4.5. Plants

Vegetation within the study area consists of pasture grasses and weeds with several small shrubs on fencelines (black hawthorn, *Crataegus douglasii*). Irrigation ditches and swales support wetland-associated plants like red-tinged bulrush (*Scirpus microcarpus*), Kellogg's sedge (*Carex kelloggii*), and field meadow-foxtail (*Alopecurus pratensis*).

4.6. Precipitation

Chapter 19 of the Engineering Field Handbook (NRCS 2015) was referenced in determining if precipitation that fell within three months of the wetland delineation was within the normal range (30-year average). **Normal** climatic conditions prevailed the aggregate three months prior to the June 22, 2023 wetland delineation (**Appendix B**). However, due to the geomorphic character of the vicinity, lack of natural streams crossing the study area, and local irrigation practices throughout the growing season, the relative contribution of precipitation toward soil moisture in the study area during the growing season is low.

4.7. Growing Season

According to Climate Analysis for Wetlands Tables (WETS) (NRCS 2023b), the growing season (28 °F or greater) at the nearest AgACIS station (Ellensburg) demonstrates a 70 percent probability of occurring between April 16 and October 14 (181 days) and 50 percent between April 20 and October 10 (173 days). Fieldwork was completed during the growing season.

4.8. Mapped Potential Wetlands

Both the NWI and county map potential Palustrine Emergent (PEM) wetland polygons throughout both parcels (**Appendix A-1**).

5. Findings

5.1. Groundwater

All 10 groundwater monitoring pits (GMP) showed groundwater to be deeper than 36 in on April 14. The irrigation season began shortly thereafter and residual irrigation leakage onto the parcel was repaired just before vigorous spring rains resulted in extraordinary flooding in early May that overtopped irrigation ditches and washed out culverts throughout the drainage.

Once atypical flood flows ended, all GMPs dried down quickly except GMPs 6 and 7[3]. The adjacent parcel to the east continued to flood irrigate and this water intermittently overflowed into GMPs 10[4] until the third week of June. Another irrigation overflow temporarily filled GMPS 6, 7, and 10 on September 14 but the irrigation was stopped shortly thereafter and the GMPs were all dry on September 28.

Given the preponderance of the data, including plant community distributions, hydric soil indicators, and geomorphic position, the only GMPs that showed the evidence of shallow groundwater/saturated soils within the uppermost 12 in of the soil profile, sans irrigation influence, were GMPs 6 and 7. The groundwater monitoring log for the 2023 growing season is included in **Appendix E**.

5.2. Wetlands

One wetland was delineated within the study area (**Figure 4**). Rated Category IV, the county assigns a regulatory wetland buffer of 40 feet (ft) (assuming land use with moderate impact)[5] plus a 15-ft building setback (total buffer radius = 55 ft).

This wetland occurs within the bottom of a topographically deep swale that, under normal conditions, is utilized to channel flood irrigation water. However, when irrigation was terminated,

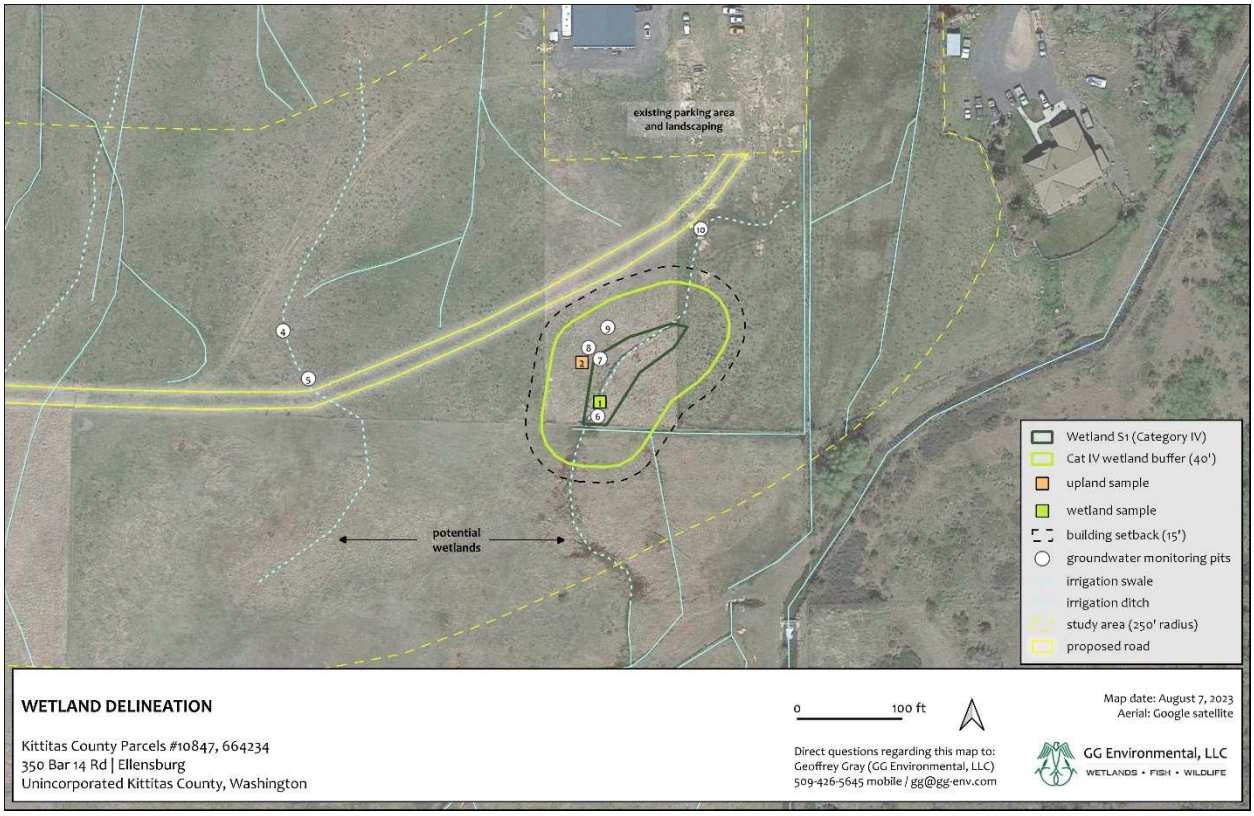
[3] GMPs 6 and 7 lie at the bottom of the irrigation swale that delineated as wetland.
[4] Other than these intermittent events, no evidence of elevated groundwater or wetland indicators was observed in GMP 10.
[5] The Category IV wetland buffer ranges from 25 ft (low impact) to 50 ft (high impact).

groundwater remained high, resulting in a saturated soil condition in the uppermost 12 in of the soil profile for 14 consecutive days. Paired with both hydrophytic vegetation and hydric soil indicators, it is inferred that natural groundwater, at least seasonally, likely explains the observed wetland hydrology indicator, in the absence of irrigation, during the growing season.

5.3. Road Construction – Impact Assessment

The proposed road alignment will be designed and constructed to avoid the wetland, wetland buffer and building setback (**Figure 4**). As such, no wetland critical areas impact is anticipated.

Figure 4. Wetland Delineation Results



6. Limitations

The data presented herein reflect, and are limited to, site conditions encountered approximately every two weeks between April 14 and September 28, 2023. Services provided by GG Environmental, LLC are performed in good faith and to the standards commonly practiced by professional wetland scientists. Although the findings presented in this report are accurate and complete according to the best available science, they should be considered to be preliminary, with no warranty, express or implied, until they have been reviewed and approved in writing by appropriate jurisdictional authorities.

7. Consultant Qualifications

Geoffrey Gray, MA, PWS is a professional biologist and wetland scientist whose 27-year career has provided him with a unique breadth of experience that can readily assist you in moving your project forward.

Investing eight years in higher education, he earned a Bachelor's Degree in Business Management and a Master's degree in Biology from California State University at Fresno.

Geoffrey has earned 12.4 credit hours of certified professional wetland training, including completion of the 38-hour Army Corps of Engineers (Corps) Wetland Delineation and Management Training Program, as well as Corps Advanced Wetland Delineation , Corps Delineation Manual Regional Supplements, Washington State Department of Ecology (Ecology) 2014 Wetland Rating System, Ecology Credit-Debit Method for Estimating Mitigation Needs, Ecology Selecting Wetland Mitigation Sites Using a Watershed Approach, and multiple courses in wetland plant identification.

Continuously employed as a wetland, fish, and wildlife biologist since 1997, while serving tenures in field research, a large environmental consulting firm, state agencies in both California and Washington, and as an independent environmental consultant, Geoff's resume includes 17 years of full-time duty as a wetland biologist, with experience ranging from the unique vernal pool wetland habitats of California's Central Valley to the diverse wetlands of Eastern Washington State, stretching from the Cascade crest to Idaho.

Spanning his career, Geoff has performed over 160 wetland delineations and has managed 35 wetland mitigation/riparian restoration sites. As a fish and wildlife biologist, he has evaluated over 600 projects for compliance under the Endangered Species Act, including 128 federal consultations.

Geoff founded GG Environmental in 2015, and has since served a diverse palette of clients including habitat restoration groups, private landowners, commercial businesses, and city governments who need assistance in overcoming the challenges of Critical Areas/Shorelines permitting and Endangered Species Act consultation.

A professional-level GPS/GIS user for 26 years, Geoff employs cutting-edge GPS technology in the field and is proficient in GIS mapping with ArcGIS and Quantum GIS (QGIS).

Globally recognized as a Professional Wetland Scientist by the Society of Wetland Scientists, Geoff's work is performed to the highest standards and is fully insured.

8. References

[Corps]. 2008. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0), Wakeley JS, Lichvar RW, Noble CV, editors. Vicksburg (MS): US Army Engineer Research and Development Center. ERDC/EL TR-08-28. Available at: https://www.usace.army.mil/Missions/Civil-Works/Regulatory-Program-and-Permits/reg_supp/

[Corps]. 2020. National Wetland Plant List, version 3.5. U.S. Army Corps of Engineers, Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory, Hanover, NH. Available at: http://wetland-plants.usace.army.mil/

[CWU]. Central Washington University [CWU]. 2023. Department of Geology. Central Washington Historical Aerial Photograph Project [Internet]. Available at: https://www.gis.cwu.edu/geog/historical_airphotos/

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Vicksburg (MS): US Army Engineer Waterways Experiment Station. Technical Report Y-87-1. Available at: http://www.swl.usace.army.mil/Portals/50/docs/regulatory/wlman87.pdf

Google. 2023. Google Earth Pro - Historic Aerial Imagery [Software Program]. Download available at: https://www.google.com/earth/versions/

Kittitas County. 2023a. Kittitas County Code, Title 17A Critical Areas. Available at: https://www.co.kittitas.wa.us/boc/countycode/title17a.aspx

Kittitas County. 2023b. COMPAS. Mapped critical areas including wetlands and streams. Available at: https://kitcogis.maps.arcgis.com/apps/webappviewer/index.html?id=8bcc146d9c2847acb2e9aa239187c25e

Kittitas Reclamation District. 2023. History of the Kittitas Reclamation District. Available at: https://www.kittitasreclamationdistrict.org/history

[NRCS] Natural Resource Conservation Service. 2006. Land Resource Regions and Major Land Resources Areas of the United States, the Caribbean, and the Pacific Basin. United States Department of Agriculture, Natural Resources Conservation Service. United States Department of Agriculture Handbook 296. Issued 2006. Mapping available online at: https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/?cid=nrcs142p2_053624

[NRCS] 2015. Hydrology Tools for Wetland Identification and Analysis. Chapter 19 in Part 650 Engineering Field Handbook. Pages 19-85 through 19-89. US. Department of Agriculture, NRCS. Available at: https://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=37808.wba

[NRCS] 2023a. Web Soil Survey [Internet]. Available at: https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm

[NRCS] 2023b. Field Office Technical Guide. Agricultural Applied Climate Information System (AgACIS). Available at: https://agacis.rcc-acis.org/

[USFWS] US Fish and Wildlife Service. 2023a. National Wetland Inventory (NWI) mapper [Internet]. Available at: https://www.fws.gov/wetlands/data/Mapper.html

This page is purposefully blank.

Appendix A. Background Information

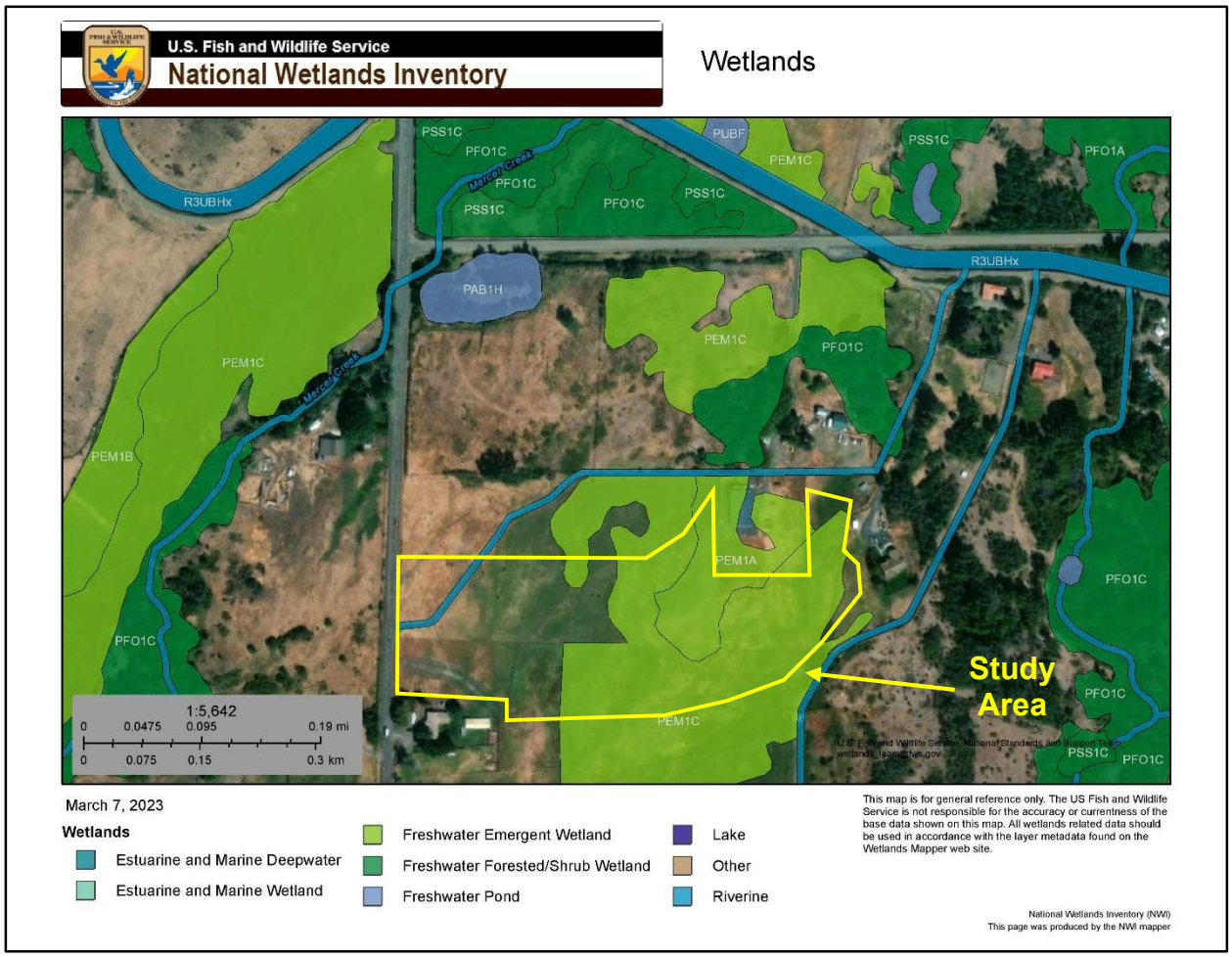
Appendix A includes the following sub-appendices:

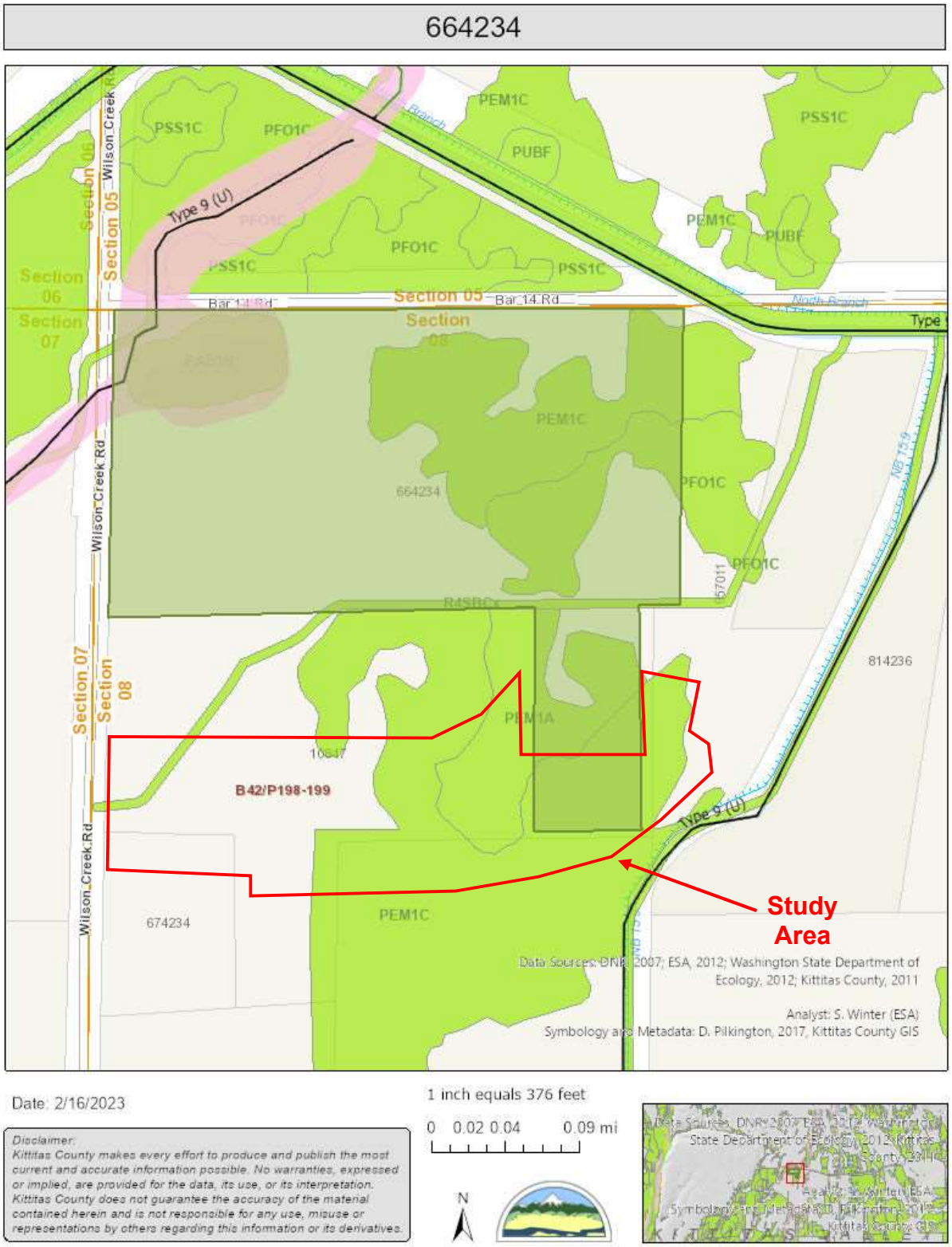
A-1 USFWS NWI and Kittitas County Mapped Potential Wetlands

A-2 NRCS Soil Survey Map

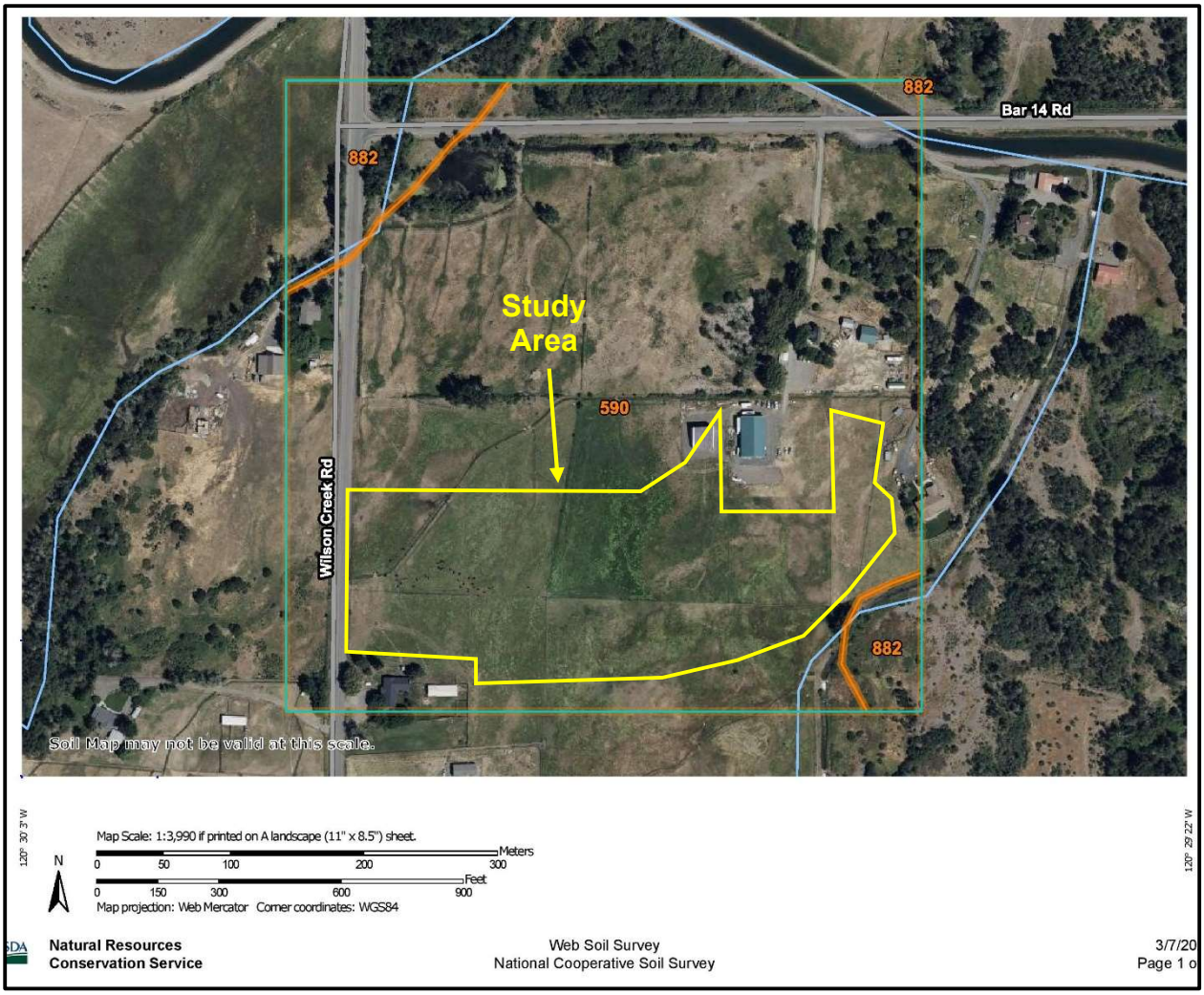
This page is purposefully blank.

Appendix A-1. USFWS NWI and Kittitas County Mapped Potential Wetlands




664234
PEM1C
PSS1C
PFO1C
PUBF
Section 06
Section 05
Wilson Creek Rd
Type 9 (U)
Bar 14 Rd
Section 07
Section 08
664234
PFO1C
814236
PEM1A
10847
B42/P198-199
674234
Study Area
Data Sources: DNR, 2007; ESA, 2012; Washington State Department of Ecology, 2012; Kittitas County, 2011
Analyst: S. Winter (ESA)
Symbology and Metadata: D. Pilkington, 2017, Kittitas County GIS
Date: 2/16/2023
1 inch equals 376 feet
0 0.02 0.04 0.09 mi
N
Disclaimer:
Kittitas County makes every effort to produce and publish the most current and accurate information possible. No warranties, expressed or implied, are provided for the data, its use, or its interpretation. Kittitas County does not guarantee the accuracy of the material contained herein and is not responsible for any use, misuse or representations by others regarding this information or its derivatives.

Appendix A-2. NRCS Soil Survey Map



Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
590	Brickmill-Nanum complex, 0 to 5 percent slopes	50.7	91.1%
882	Weirman-Kayak complex, 0 to 5 percent slopes	5.0	8.9%
Totals for Area of Interest		**55.7**	**100.0%**

Appendix B. Precipitation Analysis

Precipitation analysis per NRCS (2015). All data were obtained from the AgACIS weather station[6] at Ellensburg. Fieldwork was completed on June 22, 2023.

Normal climatic conditions prevailed the previous three months prior to the delineation (March to May). No rain fell within 10 days prior to fieldwork.

		Long-term rainfall records[1] (inches)							
	Month	3 yrs. in 10 less than	Average	3 yrs. in 10 more than	Total Rainfall Obs. [2]	Condition dry, wet, normal[3]	Condition Value	Month weight value[4]	Product of previous two columns
1st prior month	May	0.35	0.57	0.69	0.34	dry	1	3	3
2nd prior month	Apr	0.35	0.59	0.71	0.89	wet	3	2	6
3rd prior month	Mar	0.36	0.76	0.93	0.53	normal	2	1	2
								Sum	**11** [5]

[1] WETS table (NRCS 2023b); [2]Accumulated Daily Precipitation (NRCS 2023b); [3] WETS table "30% more than and 30% less than values ere referenced to compare recorded rainfall to statistically-normal precipitation; [4] Value: Dry = 1; Normal = 2; Wet = 3;
[5] 6-9: drier than normal, 10-14: normal, 15-18: wetter than normal.

Date (2023)	Precipitation Total (inches)
June 12 - 21	0.00

[6] (NRCS 2022b). AgACIS station: Ellensburg. Kittitas County (FIPS 53037).

Appendix C. Wetland Delineation Forms

This page is purposefully blank.

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

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

Project/Site: Kittitas County Parcel #10847 City/County: Unincorporated Kittitas Sampling Date: 6-22-2023

Applicant/Owner: William P. Woods Jr. State: WA Sampling Point: 1

Investigator(s): Geoffrey Gray, MA, PWS (GG Environmental, LLC) Section, Township, Range: T18N-R19E-S8

Landform (hillside, terrace, etc.): alluvial fan Local relief (concave, convex, none): concave Slope (%): 0-2

Subregion (LRR): LRR B Lat: 47° 4'13.03"N Long: 120°29'37.56"W Datum: WGS84

Soil Map Unit Name: Brickmill-Nanum complex, 0 to 5 percent slopes NWI classification: PEM

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

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

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

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

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

Remarks:
Flood irrigation and grazing temporarily halted to conduct groundwater monitoring from 4/14 to 9/30, 2023.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 20 x 20 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ =Total Cover		
Sapling/Shrub Stratum (Plot size: 15 x 15 ft)			
1.			
2.			
3.			
4.			
5.			
	____ =Total Cover		
Herb Stratum (Plot size: 5 x 5 ft)			
1. *Alopecurus pratensis*	95	Yes	FACW
2. *Carex pellita*	5	No	OBL
3.			
4.			
5.			
6.			
7.			
8.			
	100 =Total Cover		
Woody Vine Stratum (Plot size: 5 x 5 ft)			
1.			
2.			
	____ =Total Cover		

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

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	95	x 2 =	190
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		195 (B)

Prevalence Index = B/A = 1.95

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

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

Remarks:

SOIL

Sampling Point: 1

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
0-4	10YR 2/1	100					Loamy/Clayey	
4-16	10YR 2/1	97	7.5YR 2.5/3	3	C		Loamy/Clayey	Distinct redox concentrations

[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)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is 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 on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes X	No ___	Depth (inches): 10		
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0	**Wetland Hydrology Present?**	**Yes** X **No** ___

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

Remarks:

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

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

Project/Site: Kittitas County Parcel #10847 City/County: Unincorporated Kittitas Sampling Date: 6-22-2023

Applicant/Owner: William P. Woods Jr. State: WA Sampling Point: 2

Investigator(s): Geoffrey Gray, MA, PWS (GG Environmental, LLC) Section, Township, Range: T18N-R19E-S8

Landform (hillside, terrace, etc.): alluvial fan Local relief (concave, convex, none): convex Slope (%): 0-2

Subregion (LRR): LRR B Lat: 47° 4'13.40"N Long: 120°29'37.80"W Datum: WGS84

Soil Map Unit Name: Brickmill-Nanum complex, 0 to 5 percent slopes NWI classification: UPL

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

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

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

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

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

Remarks:
Flood irrigation and grazing temporarily halted to conduct groundwater monitoring from 4/14 to 9/30, 2023.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 20 x 20 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ =Total Cover		
Sapling/Shrub Stratum (Plot size: 15 x 15 ft)			
1.			
2.			
3.			
4.			
5.			
	____ =Total Cover		
Herb Stratum (Plot size: 5 x 5 ft)			
1. *Alopecurus pratensis*	90	Yes	FACW
2. *Cirsium arvense*	10	No	FACU
3.			
4.			
5.			
6.			
7.			
8.			
	100 =Total Cover		
Woody Vine Stratum (Plot size: 5 x 5 ft)			
1.			
2.			
	____ =Total Cover		

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

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	90	x 2 =	180
FAC species	0	x 3 =	0
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	100 (A)		220 (B)

Prevalence Index = B/A = 2.20

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

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

Remarks:

SOIL

Sampling Point: 2

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

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

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

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

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

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

(includes capillary fringe)

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

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

Remarks:

Appendix D. Wetland Rating Form

This page is purposefully blank.

RATING SUMMARY – Eastern Washington

Name of wetland (or ID #): Wetland S1 Date of site visit: 6/22/2023

Rated by Geoffrey Gray, MA, PWS Trained by Ecology? ☑ Yes ☐ No Date of training 2014, 2018

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

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

OVERALL WETLAND CATEGORY IV (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
X **Category IV** - Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	List appropriate rating (H, M, L)			
Site Potential	L	L	L	
Landscape Potential	M	M	M	
Value	H	L	L	**Total**
Score Based on Ratings	6	4	4	**14**

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

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

2. Category based on SPECIAL CHARACTERISTICS of wetland

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

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

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	1
Hydroperiods	H 1.2, H 1.3	1
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	1
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above*)	S 4.1	1
Boundary of area within 150 ft of the wetland (*can be added to another figure*)	S 2.1, S 5.1	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	2
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	3
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	S 3.3	3

HGM Classification of Wetland in Eastern Washington

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

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

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

   ☑ NO - go to 2 ☐ **YES** - The wetland class is **Lake Fringe** (Lacustrine Fringe)

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

   ☐ NO - go to 3 ☑ **YES** - The wetland class is **Slope**

   NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 foot deep).

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

   ☑ NO - go to 4 ☐ **YES** - The wetland class is **Riverine**

   NOTE: The Riverine wetland can contain depressions that are filled with water when the river is not flooding.

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

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

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

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

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

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

SLOPE WETLANDS

Water Quality Functions - Indicators that the site functions to improve water quality

	Points (only 1 score per box)
S 1.0. Does the site have the potential to improve water quality?	
S 1.1. Characteristics of the average slope of wetland: (*a 1% slope has a 1 ft vertical drop in elevation for every 100 ft of horizontal distance*) Slope is 1% or less — points = 3 Slope is > 1% - 2% — points = 2 Slope is > 2% - 5% — points = 1 Slope is greater than 5% — points = 0	2
S 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic (*use NRCS definitions*): Yes = 3 No = 0	0
S 1.3. Characteristics of the plants in the wetland that trap sediments and pollutants: Choose the points appropriate for the description that best fits the plants in the wetland. *Dense means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 in.* Dense, uncut, herbaceous plants > 90% of the wetland area — points = 6 Dense, uncut, herbaceous plants > ½ of area — points = 3 Dense, woody, plants > ½ of area — points = 2 Dense, uncut, herbaceous plants > ¼ of area — points = 1 Does not meet any of the criteria above for plants — points = 0	0
Total for S 1 — Add the points in the boxes above	**2**

Rating of Site Potential If score is: ☐ **12 = H** ☐ **3 - 11 = M** ☑ **- 5 = L** *Record the rating on the first page*

S 2.0. Does the landscape have the potential to support the water quality function at the site?	
S 2.1. Is > 10% of the area within 150 ft on the uphill side of the wetland in land uses that generate pollutants? Yes = 1 No = 0	1
S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1? Other Sources cattle feces and urine — Yes = 1 No = 0	1
Total for S 2 — Add the points in the boxes above	**2**

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

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

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

SLOPE WETLANDS **Hydrologic Functions** - Indicators that the site functions to reduce flooding and erosion		Points (only 1 score per box)
S 4.0. Does the site have the potential to reduce flooding and erosion?		
S 4.1. Characteristics of plants that reduce the velocity of surface flows during storms: Choose the points appropriate for the description that best fits conditions in the wetland. *Stems of plants should be thick enough (usually > 1/8 in), or dense enough, to remain erect during surface flows.*		0
Dense, uncut, **rigid** plants cover > 90% of the area of the wetland	points = 1	
All other conditions	points = 0	

Rating of site Potential If score is: ☐ **1 = M** ☑ **0 = L** *Record the rating on the first page*

S 5.0. Does the landscape have the potential to support the hydrologic functions of the site?		
S 5.1. Is more than 25% of the area within 150 ft upslope of wetland in land uses that generate excess surface runoff?	Yes = 1 No = 0	1

Rating of Landscape Potential If score is: ☑ **1 = M** ☐ **0 = L** *Record the rating on the first page*

S 6.0. Are the hydrologic functions provided by the site valuable to society?		
S 6.1. Distance to the nearest areas downstream that have flooding problems:		0
The sub-basin immediately down-gradient of site has flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds)	points = 2	
Surface flooding problems are in a sub-basin farther down-gradient	points = 1	
No flooding problems anywhere downstream	points = 0	
S 6.2. Has the site been identified as important for flood storage and flood conveyance in a regional flood control plan?	Yes = 2 No = 0	0
Total for S 6	Add the points in the boxes above	**0**

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

NOTES and FIELD OBSERVATIONS:

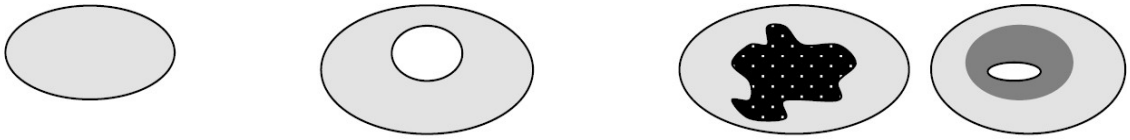
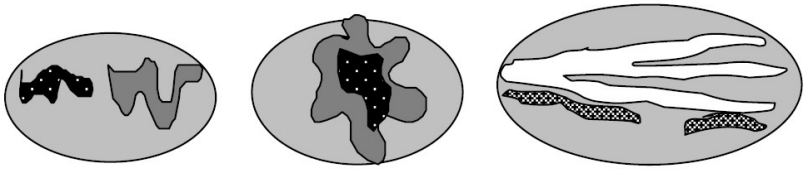
The pasture is historically grazed. Grazing was temporarily halted for a multi-month wetland delineation groundwater study. This is the only reason forage species were ungrazed in the wetland at the time of the wetland delineation. It is not reasonable to add points in S1.3 and S4.1 when the short-term, ungrazed status is an artificial condition and conducted specifically to supplement the wetland delineation. For this reason, points are added/included for S2.2 which represents the bovine pollution baseline.

The large irrigation ditch to the east is considered as a barrier to habitats in the same manner paved/gravel roads are judged to be migration barriers (applies to H2.1).

In tracing surface flow from the wetland through the down-gradient irrigation ditch system, it does not appear that water merges with a flood-prone area (applies to S6.1).

No shrub-steppe is located near the wetland as mapped by WDFW PHS (applies to H3.1).

Septic drainfield lies upgradient within 150' of the wetland (applies to S2.1).

These questions apply to wetlands of all HGM classes. **HABITAT FUNCTIONS** - Indicators that site functions to provide important habitat	(only 1 score per box)
H 1.0. Does the wetland have the potential to provide habitat for many species?	
H 1.1. Structure of plant community: *Check the Cowardin vegetation classes present and categories of emergent plants. Size threshold for each category is > = ¼ ac or > = 10% of the wetland if wetland is < 2.5 ac.* ☐ Aquatic bed ☐ Emergent plants 0 - 12 in (0-30 cm) high are the highest layer and have > 30% cover ☑ Emergent plants > 12 - 40 in (> 30-100 cm) high are the highest layer with >30% cover ☐ Emergent plants > 40 in (> 100 cm) high are the highest layer with >30% cover ☐ Scrub-shrub (areas where shrubs have > 30% cover) ☐ Forested (areas where trees have > 30% cover) 4 or more checks: points = 3 3 checks: points = 2 2 checks: points - 1 1 check: points = 0	0
H 1.2. Is one of the vegetation types Aquatic Bed? Yes = 1 No = 0	0
H 1.3. Surface water H 1.3.1. Does the wetland have areas of open water (without emergent or shrub plants) over at least ¼ ac **OR** 10% of its area during the March to early June **OR** in August to the end of September? *Answer YES for Lake Fringe wetlands.* ☐ Yes = 3 points & go to H 1.4 No = go to H 1.3.2 H 1.3.2. Does the wetland have an intermittent or permanent, and unvegetated stream within its boundaries, or along one side, over at least ¼ ac or 10% of its area? *Answer yes only if H 1.3.1 is No.* ☐ Yes = 3 No = 0	0
H 1.4. Richness of plant species Count the number of plant species in the wetland that cover at least 10 ft^2. *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 1.4. Interspersion of habitats Decide from the diagrams below whether interspersion among types of plant structures (described in H 1.1), and unvegetated areas (open water or mudflats) is high, moderate, low, or none. *Use map of Cowardin and emergent plant classes prepared for questions H 1.1 and map of open water from H 1.3. If you have four or more plant classes or three classes and open water, the rating is always high.*  **None** = 0 points **Low** = 1 point **Moderate** = 2 points All three diagrams in this row are **HIGH** = 3 points  Riparian braided channels with 2 classes	0

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*)	0
Total for H 1 Add the points in the boxes above	**1**

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

H 2.0. Does the landscape have the potential to support habitat functions of the site?	
H 2.1 Accessible habitat (only area of habitat abutting wetland). If total accessible habitat is: *Calculate:* 0 % undisturbed habitat + (6 % moderate & low intensity land uses / 2) = 3% > 1/3 (33.3%) of 1 km Polygon points = 3 20 - 33% of 1 km Polygon points = 2 10 - 19% of 1 km Polygon points = 1 < 10 % of 1 km Polygon points = 0	0
H 2.2. Undisturbed habitat in 1 km Polygon around wetland. *Calculate:* 0 % undisturbed habitat + (100 % moderate & low intensity land uses / 2) = 50% Undisturbed habitat > 50% of Polygon points = 3 Undisturbed habitat 10 - 50% and in 1 - 3 patches points = 2 Undisturbed habitat 10 - 50% and > 3 patches points = 1 Undisturbed habitat < 10% of 1 km Polygon points = 0	2
H 2.3 Land use intensity in 1 km Polygon: > 50% of 1 km Polygon is high intensity land use points = (-2) Does not meet criterion above points = 0	0
H 2.4. The wetland is in an area where annual rainfall is less than 12 in, and its water regime is not influenced by irrigation practices, dams, or water control structures. *Generally, this means outside boundaries of reclamation areas, irrigation districts, or reservoirs* Yes = 3 No = 0	0
Total for H 2 Add the points in the boxes above	**2**

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

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

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

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

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

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

SC 4.0. Bogs and Calcareous Fens

Does the wetland (or any part of the wetland unit) meet both the criteria for soils and vegetation in bogs or calcareous fens? Use the key below to identify if the wetland is a bog or calcareous fen. ***If you answer yes you will still need to rate the wetland based on its functions.***

SC 4.1. Does an area within the wetland have organic soil horizons (i.e., layers of organic soil), either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? *See Appendix C for a field key to identify organic soils.*

☐ Yes - Go to **SC 4.3** ☑ No - Go to **SC 4.2**

SC 4.2. Does an area within the wetland have organic soils, either peats or mucks, that are less than 16 in deep over bedrock or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond?

☐ Yes - Go to **SC 4.3** ☑ No = **Is not a bog for rating**

SC 4.3. Does an area within the wetland have more than 70% cover of mosses at ground level AND at least 30% of the total plant cover consists of species in Table 5?

☐ Yes = **Category I bog** ☐ No - Go to **SC 4.4**

NOTE: If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 5 are present, the wetland is a bog.

SC 4.4. Is an area with peats or mucks forested (> 30% cover) with subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 5 provide more than 30% of the cover under the canopy?

☐ Yes = **Category I bog** ☐ No - Go to **SC 4.5**

SC 4.5. Do the species listed in Table 6 comprise at least 20% of the total plant cover within an area of peats and mucks?

☐ Yes = **Is a Calcareous Fen for purpose of rating** ☐ No - Go to **SC 4.6**

SC 4.6. Do the species listed in Table 6 comprise at least 10% of the total plant cover in an area of peats and mucks, AND one of the two following conditions is met:

☐ Marl deposits [calcium carbonate ($CaCO_3$) precipitate] occur on the soil surface or plant stems

☐ The pH of free water is ≥ 6.8 AND electrical conductivity is ≥ 200 uS/cm at multiple locations within the wetland

☐ Yes = **Is a Category I calcareous fen** ☐ No = **Is not a calcareous fen**

SC 5.0. Forested Wetlands

Does the wetland have an area of forest rooted within its boundary that meets **at least one** of the following three criteria? (*Continue only if you have identified that a forested class is present in question H*

☐ The wetland is within the 100 year floodplain of a river or stream

☐ Aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species

☐ There is at least ¼ ac of trees (even in wetlands smaller than 2.5 ac) that are “mature” or “old-growth” according to the definitions for these priority habitats developed by WDFW (*see definitions in question H3.1*)

☐ Yes - Go to **SC 5.1** ☑ No = **Not a forested wetland with special characteristics**

SC 5.1. Does the wetland have a forest canopy where more than 50% of the tree species (by cover) are slow growing native trees (*see Table 7*)?

☐ Yes = **Category I** ☐ No - Go to **SC 5.2**

SC 5.2. Does the wetland have areas where aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species?

☐ Yes = **Category I** ☐ No - Go to **SC 5.3**

SC 5.3. Does the wetland have at least ¼ acre with a forest canopy where more than 50% of the tree species (by cover) are fast growing species (*see Table 7*)?

☐ Yes = **Category II** ☐ No - Go to **SC 5.4**

SC 5.4. Is the forested component of the wetland within the 100 year floodplain of a river or stream?

☐ Yes = **Category II** ☐ No = **Not a forested wetland with special characteristics**

Category of wetland based on Special Characteristics

Choose the highest rating if wetland falls into several categories

If you answered No for all types, enter “Not Applicable” on Summary Form

Appendix B: WDFW Priority Habitats in Eastern Washington

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

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

- ☐ **Aspen Stands**: Pure or mixed stands of aspen greater than 1 ac (0.4 ha).
- ☐ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report*).
- ☐ **Old-growth/Mature forests**: Old-growth east of Cascade crest – Stands are highly variable in tree species composition and structural characteristics due to the influence of fire, climate, and soils. In general, stands will be >150 years of age, with 10 trees/ac (25 trees/ha) that are > 21 in (53 cm) dbh, and 1-3 snags/ac (2.5-7.5 snags/ha) that are > 12-14 in (30-35 cm) diameter. Downed logs may vary from abundant to absent. Canopies may be single or multi-layered. Evidence of human-caused alterations to the stand will be absent or so slight as to not affect the ecosystem's essential structures and functions. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west and 80-160 years old east of the Cascade crest.
- ☐ **Oregon White Oak**: Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158 – see web link above*).
- ☐ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
- ☐ **Caves**: A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.
- ☐ **Cliffs**: Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.
- ☐ **Talus**: Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- ☐ **Snags and Logs**: Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.
- ☐ **Shrub-steppe**: A nonforested vegetation type consisting of one or more layers of perennial bunchgrasses and a conspicuous but discontinuous layer of shrubs (see Eastside Steppe for sites with little or no shrub cover).
- ☐ **Eastside Steppe**: Nonforested vegetation type dominated by broadleaf herbaceous flora (i.e., forbs), perennial bunchgrasses, or a combination of both. Bluebunch wheatgrass (*Pseudoroegneria spicata*) is often the prevailing cover component along with Idaho fescue (*Festuca idahoensis*), Sandberg bluegrass (*Poa secunda*), rough fescue (*F. campestris*), or needlegrasses (*Achnatherum* spp.).
- ☐ **Juniper Savannah**: All juniper woodlands.

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

Direct questions regarding this map to:
Geoffrey Gray, MA, PWS
509-426-5645 mobile | gg@gg-env.com

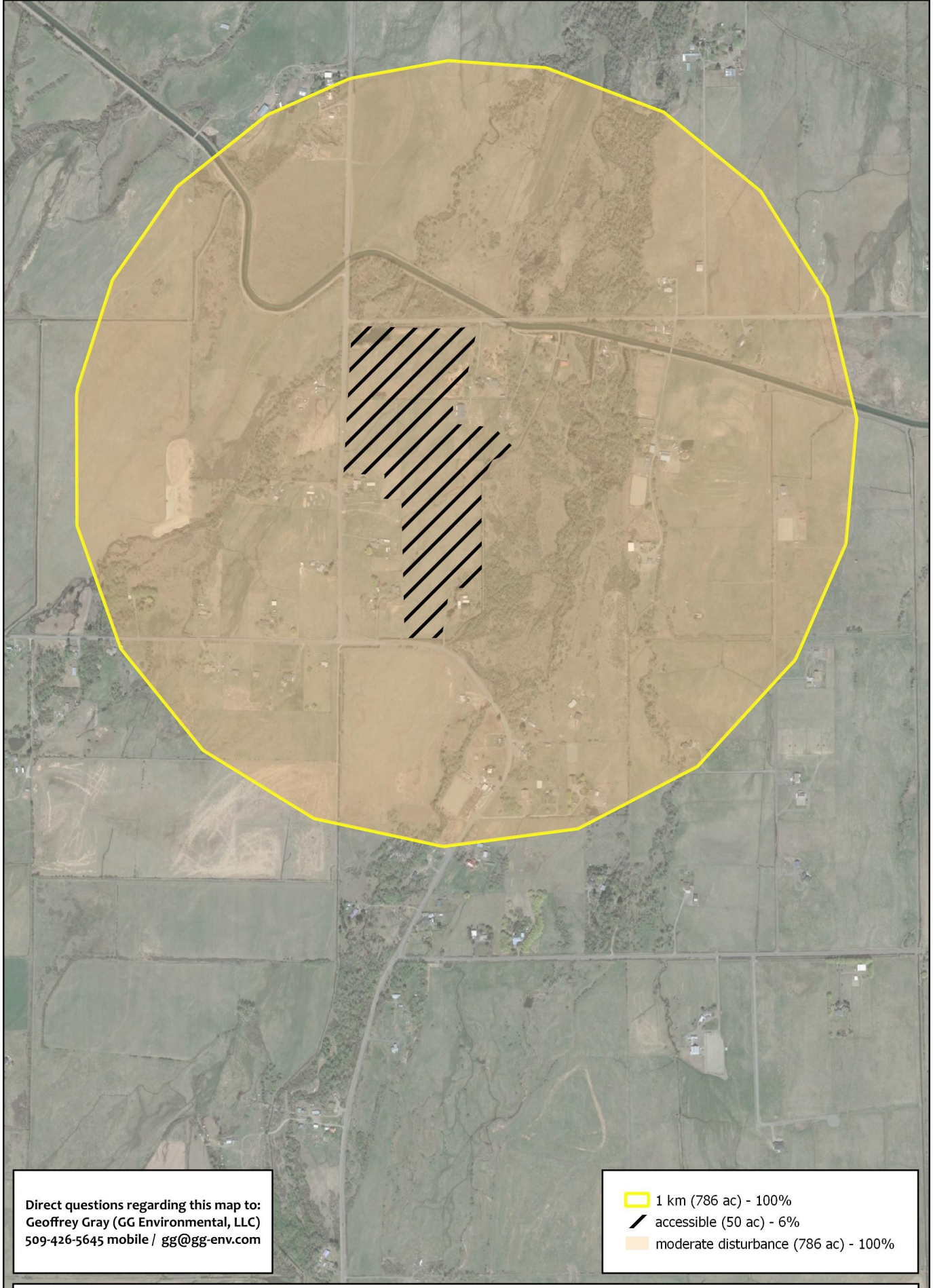
ECOLOGY RATING - FIGURE 1

Kittitas County Parcels #10847, 664234
350 Bar 14 Rd | Ellensburg
Unincorporated Kittitas County, Washington

Map date: August 7, 2023
Aerial: Google satellite 4/17/2021

0 50 ft

GG Environmental, LLC
WETLANDS • FISH • WILDLIFE



Direct questions regarding this map to:
Geoffrey Gray (GG Environmental, LLC)
509-426-5645 mobile / gg@gg-env.com

ECOLOGY RATING - FIGURE 2

Kittitas County Parcels #10847, 664234
350 Bar 14 Rd | Ellensburg
Unincorporated Kittitas County, Washington

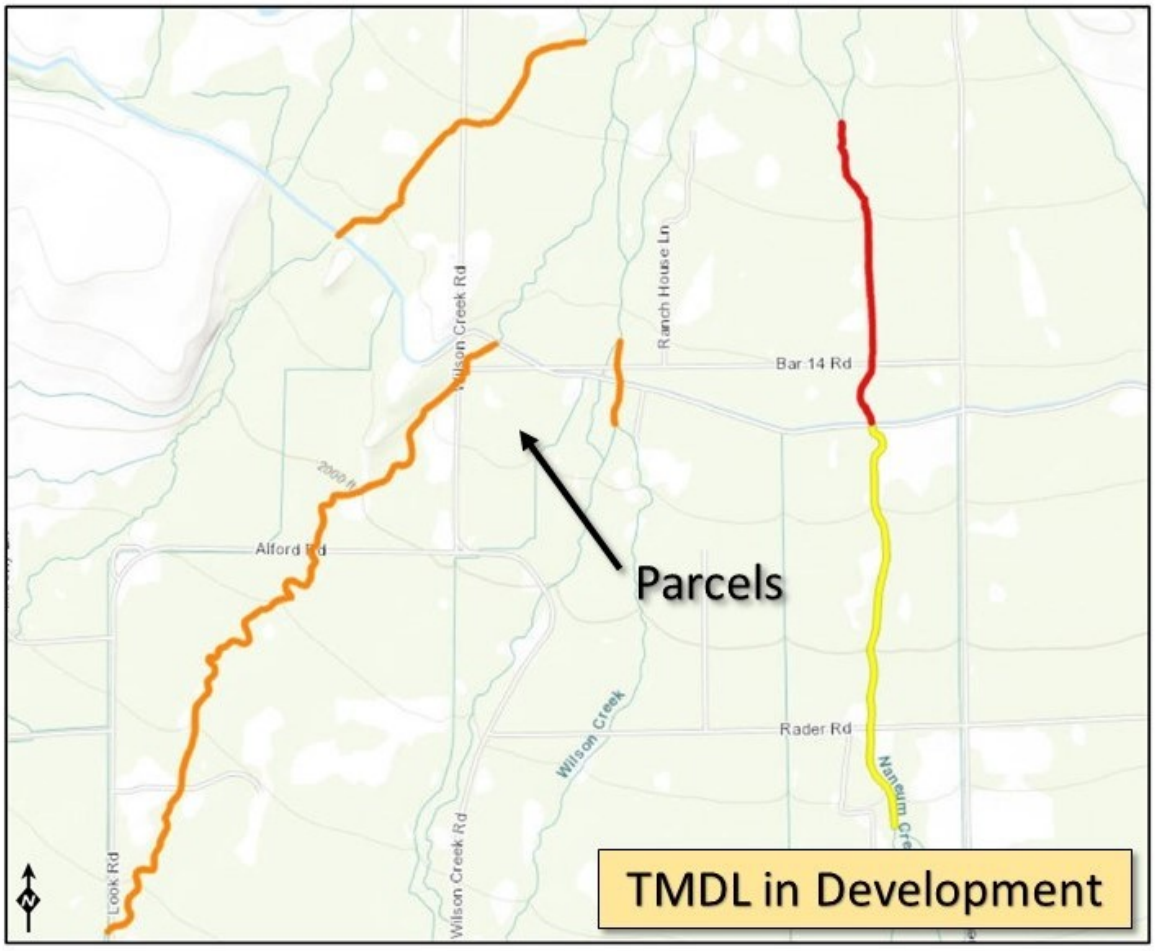
Map date: August 7, 2023
Aerial: Google satellite

0 1,000 ft

GG Environmental, LLC
WETLANDS • FISH • WILDLIFE

August 7, 2023

Ecology Rating – Figure 3



Assessed Water/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

City of Yakima, County of Kittitas, WA State Parks GIS, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau, USDA

Appendix E. Groundwater Monitoring Log

This page is purposefully blank.

Groundwater Monitoring Log - 2023

Client: James Ritter, POC for William P. Woods, Jr. **Address:** 350 Bar 14 Rd. Ellensburg, WA 98926

Phone: (206) 949-9143 / (206) 949-9143 (Ritter) **Email:** jamesSritter@gmail.com

Parcel: 10847 **County:** Kittitas

GROUNDWATER MONITORING LOG (refer to notes at bottom for each sampling date)

Pit ID:	1	2	3	4	5	6	7	8	9	10
Latitude:	47.07034988	47.07053429	47.07032863	47.07047724	47.07035226	47.0702541	47.07040379	47.07043294	47.07048588	47.07074302
Longitude:	-120.4975981	-120.4975205	-120.4960993	-120.4949908	-120.4948937	-120.4937876	-120.4937791	-120.4938228	-120.4937497	-120.4933937
Pit Depth (in):	36	36		37	36	34	36	35	36	29
Soil observed:	cobble	cobble	Cobble/Loam	Loam	Loam	Loam	Cobble/Loam	Loam	Loam	Cobble/Loam

Date	OBSERVATIONS									
2023.04.14	X	X	*overflow (must fix)*	37	X	X	X	X	X	X
2023.04.28	0	0	30	0	22	0	3	*No data*	9	2
					24		9	*No data*	15	10
2023.05.12	flood	flood	flood	flood	flood	flood	flood	flood	flood	flood
2023.05.29	>24	>24	>24	10	13	0	4	15	16	8
	No GW	*No GW*	*No GW*	27	28	14	18	32	20	*No GW*
2023.06.08	X	X	X	22	X	13	8	23	20	20
				No GW		25	27	*No GW*	*No GW*	*No GW*
2023.06.22	X	X	X	21	X	2	3	24	18	3
				No GW		19	24	*No GW*	24	*No GW*
2023.07.06	X	X	X	34	X	18	22	X	28	X
				No GW		*No GW*	*No GW*		*No GW*	
2023.07.20	X	X	X	X	X	24	24	X	24	X
						No GW	28		*No GW*	
2023.08.03	X	X	X	X	X	21	28	X	X	X
						No GW	*No GW*			
2023.08.17	X	X	X	X *moist 26*	X	21	29	X	X	X
						No GW	*No GW*			
2023.08.31	X	X	X	30	X	X	X	X	X	X
				No GW						
2023.09.14	X	X	X	X *moist 35*	X	irrigation overflow (full)	6	21	11	irrigation overflow (full)
							11	24	14	
2023.09.28	X	X	X	X	X	X	X	X	X	X
Pit ID:	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**

NOTES:

2023.04.14	GW only observed in Pit #4.
2023.04.28	Inadvertant irrigation leakage flowing, filling the pits. Impossible to determine GW elev.
2023.05.12	Extraordinary flood flow filled pits. Monitoring cancelled.
2023.05.29	Pits #1-3 dried down very quickly. GW dropped in #4-5 but sat still shallow (irrigation ditch still leaking and will be plugged ASAP). Pits #6-10 still very wet with high GW and saturation in upper 12 in (adjacent parcel irrigating with some overflow onto subject parcel).
2023.06.08	No notes.
2023.06.22	Data for pits #6-10 corrupted by irrigation overflow from up-gradient neighbor to the east.
2023.07.06	Been dry since last monitoring. All pits signficantly drier.
2023.07.20	Irrigation has been off for an extended period despite the hot weather.
2023.08.03	Irrigation still off. All pits drying down.
2023.08.17	Neighbor to east is irrigating but no overflow/seepage changing the GW pit hydrology since last monitoring session (repaired ditch leakage).
2023.08.31	Pits continue to dry down with a slight wetting of Pit #4 - but still to low to meet the hydrology indicator.
2023.09.14	Neighbor had been flood irrigating for previous four days. Vigorous overflow into swale, filling GW pits 6, 10 and raising GW in 7-9.
2023.09.28	Final monitoring. Irrigation overflow gone. All pits dry except for surface moisture from recent rains.

Key:					
	X	Dry to bottom of pit		#	Saturated in upper 12 in with depth indicated (in)
	#	Saturated below 12 in with depth indicated (in)		#	Groundwater depth (in)