CLEANUP ACTION PLAN

THOMPSON FIELD
PORTION OF KING COUNTY PARCEL NO. 0825069104
REDMOND, WASHINGTON

Submitted by:
Farallon Consulting, L.L.C.
975 5th Avenue Northwest
Issaquah, Washington 98027

Farallon PN: 650-031

For:
Estate of Barbara J. Nelson and WCN GST Non-Exempt Marital Trust No. 2
c/o Nelson Legacy Group, LLC
16508 Northeast 79th Street
Redmond, Washington 98052

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Prepared by:

Stuart Brown
Associate Environmental Scientist

Reviewed by:

Clifford T. Schmitt. L.G., L.H.G.
Principal Hydrogeologist

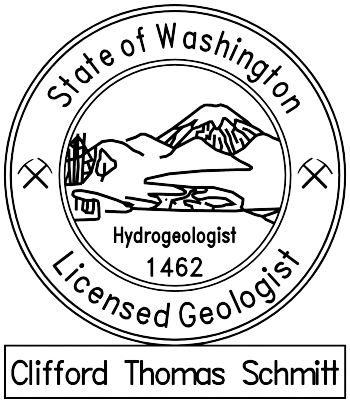

TABLE OF CONTENTS

ACRONYMS AND ABBREVIATIONS iii

1.0 INTRODUCTION 1-1
1.1 BACKGROUND 1-1
1.2 CLEANUP ACTION PURPOSE 1-2
1.3 ORGANIZATION 1-2

2.0 SITE DESCRIPTION AND BACKGROUND 2-1
2.1 SITE DESCRIPTION AND CURRENT AND HISTORICAL LAND USES 2-1
2.2 CURRENT AND HISTORICAL USES OF SURROUNDING AREA . 2-2
2.3 SITE GEOLOGY AND HYDROGEOLOGY 2-2
2.4 PREVIOUS ENVIRONMENTAL INVESTIGATIONS 2-3

3.0 TECHNICAL ELEMENTS 3-1
3.1 APPLICABLE RELEVANT AND APPROPRIATE REQUIREMENTS 3-1
3.2 CONSTITUENTS OF CONCERN 3-2
3.3 MEDIUM OF CONCERN 3-2
3.4 EXPOSURE PATHWAY 3-2
3.5 CLEANUP LEVELS 3-2
3.6 POINT OF COMPLIANCE 3-2

4.0 SELECTED CLEANUP ACTION 4-1
4.1 CLEANUP ACTION OBJECTIVE 4-1
4.2 CLEANUP ACTION DESCRIPTION 4-1
4.2.1 Worker Health and Safety 4-2
4.2.2 Soil Excavation and Disposal 4-2
4.2.3 Compliance Monitoring 4-2
4.2.4 Site Restoration 4-3
4.3 RESTORATION TIME FRAME 4-3
4.4 SCHEDULE FOR IMPLEMENTATION 4-3

5.0 BIBLIOGRAPHY 5-1

6.0 LIMITATIONS 6-1
6.1 GENERAL LIMITATIONS 6-1
6.2 LIMITATION ON RELIANCE BY THIRD PARTIES 6-1

FIGURES

Figure 1 *Site Vicinity Map*
Figure 2 *Property Plan*
Figure 3 *Site Figure*
Figure 4 *Cross Section A-A'*
Figure 5 *Cross Section B-B'*
Figure 6 *Soil Analytical Results for cPAH TEC and Total Naphthalenes*

TABLES

Table 1 *Groundwater Elevations*
Table 2 *Soil Analytical Results for PAHs*

APPENDICES

Appendix A Talasaea Critical Areas Report
Appendix B Preliminary Grading Plan
Appendix C Sampling and Analysis Plan

ACRONYMS AND ABBREVIATIONS

AESI	Associated Earth Sciences Incorporated
ARARs	applicable or relevant and appropriate requirements
bgs	below ground surface
CAP	*Cleanup Action Plan, Thompson Field, Portion Of King County Parcel No. 0825069104, Redmond, Washington* dated October 2022 prepared by Farallon Consulting, L.L.C. for the Estate of Barbara J. Nelson and WCN GST Non-Exempt Marital Trust No. 2 (this document)
COCs	constituents of concern
cPAHs	carcinogenic polycyclic aromatic hydrocarbons
Critical Areas Report	*Critical Areas Report, Thompson Field Contamination Remediation and Wetland Enhancement Plan, Gunshy Manor, King County, Washington* dated July 1, 2022 prepared by Talasaea Consultants, Inc.
E&E	Ecology and Environment, Inc.
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
Estate	the Estate of Barbara J. Nelson and WCN GST Non-Exempt Marital Trust No. 2
Expedited VCP	Expedited Voluntary Cleanup Program
Farallon	Farallon Consulting, L.L.C.
HASP	Health and Safety Plan
mg/kg	milligrams per kilogram
MTCA	Washington State Model Toxics Control Act Cleanup Regulation
PAHs	polynuclear aromatic hydrocarbons

Property	King County Parcel Nos. 0825069012, 0825069067, 0825069013, 0825069102, 0825069103, 0825069104, and 0825069105
RCW	Revised Code of Washington
RI	Remedial Investigation
RI Report	*Remedial Investigation Report, Thompson Field Site, Portion of King County Parcel No. 0825069104, Redmond, Washington* dated April 6, 2021 prepared by Farallon Consulting, L.L.C. for the Estate of Barbara J. Nelson and WCN GST Non-Exempt Marital Trust No. 2 c/o Nelson Legacy Group, LLC
TEC	toxic equivalent concentration
Thompson Field	the portion of the property on King County Parcel No. 0825069104 in unincorporated King County near Redmond, Washington owned by Estate of Barbara J. Nelson and WCN GST Non-Exempt Marital Trust No. 2
Thompson Field Site	the area of the western portion of Thompson Field where total naphthalene concentrations and the total carcinogenic polycyclic aromatic hydrocarbons toxic equivalent concentration in soil exceed Washington State Model Toxics Control Act Cleanup Regulation cleanup levels
USACE	U.S. Army Corps of Engineers
WAC	Washington Administrative Code

1.0 INTRODUCTION

This Cleanup Action Plan (CAP) has been prepared by Farallon Consulting, L.L.C. (Farallon) for the Estate of Barbara J. Nelson and WCN GST Non-Exempt Marital Trust No. 2 (Estate) to present the approach for cleanup and restoration of a localized area of fill material with total carcinogenic polycyclic aromatic hydrocarbons (cPAHs), calculated as a toxic equivalent concentration (TEC), and total naphthalenes at concentrations exceeding applicable regulatory levels at a portion of the property on King County Parcel No. 0825069104 in unincorporated King County near Redmond, Washington. This portion of the property owned by the Estate is known as Thompson Field. The area of the western portion of Thompson Field where total naphthalene concentrations and total cPAHs TEC in soil exceed Washington State Model Toxics Control Act Cleanup Regulation (MTCA) cleanup levels, as established in Chapter 173-340 of the Washington Administrative Code (WAC 173-340), is herein referred to as the Thompson Field Site (Figures 1 through 3). The planned cleanup action at the Thompson Field Site will be conducted as an independent remedial action under the supervision of the Washington State Department of Ecology (Ecology) Expedited Voluntary Cleanup Program (Expedited VCP).

1.1 BACKGROUND

King County Parcel No. 0825069104 is part of the greater property comprising King County Parcel Nos. 0825069067, 0825069012, 0825069013, 0825069102, 0825069103, 0825069104, and 0825069105 (Property). Thompson Field is part of a preliminary plat related to proposed development at the Property. Following plat approval, Thompson Field will remain as undeveloped open space. The Estate has been working with King County and Ecology since 2019 to integrate plans for redevelopment of the Property with the appropriate level of cleanup to restore beneficial use of the Thompson Field Site. Wetland creation and restoration activities will be conducted in coordination among the Estate and the U.S. Army Corps of Engineers (USACE), Ecology, and King County, as appropriate. The Thompson Field Site was entered into the Expedited VCP as required by King County to obtain concurrence that the collective environmental investigation work conducted by Farallon, and by Ecology and Environment, Inc. (E&E) on behalf of the U. S. Environmental Protection Agency (EPA), and proposed cleanup action work will meet the requirements for completing a cleanup action under MTCA. The Expedited VCP Site Identification No. is 8042; the Cleanup Site Identification No. is 15285, and the Ecology Site name is Thompson Field Gunshy Manor (Ecology 2022b).

The *Remedial Investigation Report, Thompson Field Site, Portion of King County Parcel No. 0825069104, Redmond, Washington* dated April 6, 2021 prepared by Farallon (2021)(RI Report) documenting subsurface characterization activities (RI) conducted at the Thompson Field Site in 2020 and 2021 was submitted to Ecology in April 2021. The Estate did not request an opinion letter from Ecology regarding the RI Report, but Ecology (2022b) noted that the RI Report appeared to be sufficient for selection of cleanup standards and evaluation of appropriate cleanup actions for the Thompson Field Site. Additional characterization work to supplement the RI was conducted at the Thompson Field Site between July 2021 and January 2022, documented in the

Letter regarding Addendum to Remedial Investigation Report, Thompson Field Site dated February 24, 2022 (Farallon 2022). Additional details regarding the RI and supplemental RI activities are provided in Section 2.4, Previous Environmental Investigations.

Based on the results from the RI, Ecology (2022b) stated that the Thompson Field Site could move forward with preparation of a CAP. This CAP provides the details of the cleanup action that will be conducted at the Thompson Field Site.

1.2 CLEANUP ACTION PURPOSE

The purpose of the cleanup action is to conduct a MTCA-compliant cleanup that will be protective of human health and the environment. Following the cleanup action, Thompson Field will remain an undeveloped permanent open space, with enhancement of portions of existing wetland areas. Completion of the cleanup activities presented herein will meet the requirements for a cleanup action under WAC 173-340-400 through 173-340-440.

1.3 ORGANIZATION

This CAP has been organized into the following sections:

- **Section 2, Site Description and Background,** provides a description of the Thompson Field Site and surrounding area and their current and historical uses, the geologic and hydrogeologic setting, and a summary of previous environmental investigations conducted at the Thompson Field Site.
- **Section 3, Technical Elements,** provides a discussion of the applicable or relevant and appropriate requirements (ARARs), the COCs, the medium of concern, exposure pathways, cleanup levels, and the point of compliance.
- **Section 4, Selected Cleanup Action,** presents the cleanup action objective, describes the cleanup action, including the rationale for selecting this alternative, presents the restoration time frame, and provides the anticipated schedule for implementation of the cleanup action.
- **Section 5, Bibliography,** lists the documents used in the preparation of this CAP.
- **Section 6, Limitations,** presents Farallon's standard limitations applicable to this CAP.

2.0 SITE DESCRIPTION AND BACKGROUND

This section provides a description of the Thompson Field Site and surrounding area and their current and historical uses, the geologic and hydrogeologic setting, and a summary of previous environmental investigations conducted at the Thompson Field Site.

2.1 SITE DESCRIPTION AND CURRENT AND HISTORICAL LAND USES

Thompson Field comprises the eastern portion of King County Parcel No. 0825069104, located in the Evans Creek Valley near Redmond, unincorporated King County, Washington (Figures 2 and 3). The coordinates for Thompson Field are 47º 40’ 11.78” north and -122º 4’ 30.13” west. According to the King County (2021) Department of Assessments, King County Parcel No. 0825069104 totals 38.14 acres and has a Public Land Survey System location described as the southwestern quarter of the northwestern quarter of Section 08, Township 25 North, Range 6 East; Thompson Field consists of approximately 12 acres within that parcel (Figure 2).

According to the King County (2021) Department of Assessments, Thompson Field and the surrounding area are zoned as RA-5 Rural. Residential properties and housing developments are present north, east, and west of Thompson Field; the Evans Creek Natural Area is to the south. Evans Creek is approximately 600 feet west of Thompson Field. According to the Ecology (2021) Well Construction and Licensing Search Tools, one irrigation well is present east and hydraulically cross- or up-gradient of Thompson Field at a higher elevation. Eight monitoring wells are present on Thompson Field (Figure 3).

The Thompson Field Site lies on the western portion of the larger open space referred to as Thompson Field; Thompson Field in turn, is located on the western portion of the Property (Figures 2 and 3). Future land use at the Property consists of development of up to 23 building sites for single-family homes on the portion of the Property east of Thompson Field; Thompson Field will remain a permanent undeveloped open space.

The U.S. Geological Survey (2017) topographic map for Redmond, Washington depicted Thompson Field at an elevation of approximately 80 feet above mean sea level. Topography at Thompson Field is relatively flat, with top-of-monument elevations for monitoring wells at Thompson Field ranging from 66.37 above mean sea level at monitoring well FMW-07 to 69.10 above mean sea level at monitoring well FMW-05 (Figure 3; Table 1). Regional topography around Thompson Field is relatively flat to the north, west, and south, with a steeply rising hillside to the east. Surface water is present in agricultural ditches that surround Thompson Field to the north, east, south, and west. Due to the flat-lying nature of the surface topography at Thompson Field and the Thompson Field Site, no sheet flow runoff to the agricultural ditches is suspected, with the exception of very minor locations from the sidewalls of the ditches.

The land comprising Thompson Field was obtained by the Estate in 1975, and is a portion of the Property, which was purchased by Bill and Barbara Nelson in 1957. Operations at Thompson Field included the raising of cattle and horses. Thompson Field previously was used as a hayfield for

horses boarded at the Property. Thompson Field currently consists of a grass-covered field, with no structures.

Historically, Thompson Field was a forested area, which was cleared of trees sometime after 1975 (E&E 2020). In late 1982 or early 1983, fill soil from the Interstate 90 tunnel project in the Mount Baker Ridge area of Seattle was placed on Thompson Field to raise it to its current elevation and create pastureland (E&E 2020).

2.2 CURRENT AND HISTORICAL USES OF SURROUNDING AREA

Current uses of properties surrounding Thompson Field are as follows (Figure 2):

- The north-adjacent property is developed with a 3,300-square-foot private residence.
- The east-adjacent property is owned by the Estate and formerly operated as agricultural fields. A residential development is present farther east up a steep hillside.
- The south-adjacent property is undeveloped wetland operated as the Evans Creek Natural Area.
- The west-adjacent property is owned by the Estate and developed with a 1,440-square-foot private residence. Vacant industrial land is farther west across 196th Avenue Northeast.

Farallon reviewed historical aerial photographs of Thompson Field and the surrounding area as part of the RI, detailed in the RI Report. Historically, properties surrounding Thompson Field appeared to be primarily undeveloped and wooded from at least 1943 through 1969, with the exception of agricultural operations conducted to the east and west. In a 1977 aerial photograph, residential homes were visible north and east of Thompson Field, with the density of development increasing through 2017. Adjacent properties appeared similar to the present by 2006.

2.3 SITE GEOLOGY AND HYDROGEOLOGY

Detailed descriptions of the Thompson Field Site physical and environmental setting, including regional geography, geology, hydrogeology, surface water, critical areas, sensitive receptors, and climate, were provided in Sections 2.1, 3.3, 3.4, and 4.4. of the RI Report. Farallon observed subsurface conditions during the additional characterization field work and recorded observations on boring logs included in the RI Report as Appendix B. General stratigraphy at the Thompson Field Site is described below.

A fill layer of variable thickness is present across much of Thompson Field to depths ranging from approximately 2 to 6 feet below ground surface (bgs), with the fill thickness increasing from east to west. The fill layer was not observed during advancement of borings proximate to the eastern boundary of Thompson Field. The fill material observed was composed of silty sand, sandy silt, and silt containing varying amounts of gravel, wood, and brick. Native soil underlaying the fill is an approximately 3- to 8-foot-thick layer of alluvium consisting of silt and organic material, which is further underlain by glacial outwash deposits consisting of gravel, sand, and silt extending to

the maximum depth explored of 20 feet bgs. Cross sections of the Thompson Field Site are provided on Figures 4 and 5.

Descriptions of regional hydrogeology were provided in Section 3.4.1 of the RI Report. The interval of first-encountered groundwater in the fill and underlying recent alluvium at Thompson Field varies from depths of approximately 1 to 6.5 feet bgs, depending on location and seasonal fluctuations (Table 1).

Previous investigations documented in the RI Report indicated that the groundwater flow direction at the Thompson Field Site is radial from the center of Thompson Field, with an overall trend to the northwest and northeast. Surface water in the agricultural ditches surrounding Thompson Field was measured at 60.19 to 61.90 feet North American Vertical Datum of 1988, with a general flow to the south on the eastern half of Thompson Field, and to the west on the northern and western portions. Groundwater and surface water elevation measurements are provided in Table 1.

The RI Report concluded that groundwater at Thompson Field and surface water in the surrounding agricultural ditches were interpreted as being in communication, based on the groundwater and surface water elevations measured in December 2020 and January 2021.

On September 16, 2022, Farallon measured depth-to-groundwater to the nearest 0.01 foot in each monitoring well using an electronic water-level measuring device to evaluate the direction of groundwater flow and hydraulic gradient across Thompson Field. Depth to groundwater ranged from 3.38 feet below top of casing at monitoring well FMW-08 to 6.26 feet below top of casing at monitoring well FMW-05 (Table 1). Based on the depth to water measurements collected from monitoring wells FMW-01 through FMW-08, the flow direction of groundwater at Thompson Field on September 16, 2022 is interpreted to be north-northeast, with a gradient of approximately 0.013 foot per foot.

2.4 PREVIOUS ENVIRONMENTAL INVESTIGATIONS

On March 20, 1984, USACE performed an inspection at Thompson Field to investigate the potential for fill soil having been placed in wetlands adjacent to Evans Creek (E&E 2020). A letter from USACE (1984) dated April 27, 1984 notified William Nelson that the inspection discovered fill material placed on wetlands adjacent to waters of the United States without a USACE permit. Following notification by USACE on March 26, 1986, a portion of the fill material was removed by the property owners (E&E 2020). The fill removal was determined to be satisfactory to address the issue; no further action by King County or USACE was anticipated (E&E 2020).

On February 18, 2015, representatives of Ecology, EPA (2016), USACE, and the National Oceanic and Atmospheric Administration conducted a site visit at Thompson Field to collect soil samples following a report that fill material was placed into wetlands adjacent to the southern portion of Thompson Field. As a result of the investigation, EPA (2016) determined that the fill was placed without a permit on or before January 2010, and was in violation of the Clean Water Act, which

resulted in the property owner entering into an Administrative Order on Consent detailing restoration and mitigation requirements at Thompson Field.

From September 2009 to March 2018, Associated Earth Sciences Incorporated (AESI) (2018) completed 48 test pits (SL-1 through SL-17, SLA-1 through SLA-17, EP-1 through EP-10, and IT-1 through IT-4) at the Property east of Thompson Field for geotechnical purposes. Fill soil was encountered at three of the 48 test pits (test pits EP-1, EP-3, and EP-5) to a maximum depth of 3 feet bgs. According to an AESI (2018) site figure, the test pits where fill soil was encountered were in wooded portions of the Property in the vicinity of historical residential operations. A review of the test pit logs indicated that the fill material at test pit EP-3 was backfill in a utility trench.

In 2018, members of the community notified EPA of their concern that imported fill material residing on Thompson Field may contain hazardous substances. E&E on behalf of EPA conducted a Preliminary Assessment at Thompson Field in October and November 2019. E&E advanced four borings (BH01 through BH03 and BK01) to a maximum depth of 16 feet bgs using a direct-push drill rig, and borings BH04 through BH06 to a maximum depth of 3 feet bgs using a hand-auger (Figure 2). Reconnaissance groundwater samples were collected from borings BH01, BH02, and BK01. E&E also collected groundwater samples from off-Property monitoring wells located approximately 0.4 mile northwest of Thompson Field. After receipt and evaluation of the soil and groundwater analytical data and discussions with the Estate parties, EPA concluded that further investigations were not warranted under its programs, with the understanding that the Estate parties would continue regulatory interaction with Ecology, as needed.

Farallon conducted characterization activities at the Property from July 2020 to February 2021 to address data gaps identified during the Preliminary Assessment. The characterization activities conducted by Farallon consisted of the following:

- Advancing 37 borings (FB-01 through FB-29 and FMW-01 through FMW-08) to a maximum depth of 20 feet bgs at the Property to observe soil conditions, and to collect soil samples to be analyzed for constituents of potential concern identified in the report documenting the Preliminary Assessment;
- Installing and sampling groundwater monitoring wells FMW-01 through FMW-08 at Thompson Field;
- Reviewing logs for 48 geotechnical test pits completed at the Property; and
- Completing a Site-Specific Terrestrial Ecological Evaluation for Thompson Field.

Results from the investigation activities conducted at the Thompson Field Site between July 2020 and February 2021 were discussed in the RI Report. Water levels measured in monitoring wells at the Thompson Field Site are shown in Table 1. Analytical results for polycyclic aromatic hydrocarbons (PAHs) are summarized in Table 2.

Co-located total naphthalene concentrations and total cPAH TECs exceeding MTCA Method A cleanup levels were detected in soil during the subsurface investigations conducted by Farallon in 2020 and 2021 for the RI. Therefore, naphthalene and cPAHs were identified as the COCs for soil for the Thompson Field Site. The extent of total naphthalene concentrations and total cPAH TECs exceeding MTCA Method A cleanup levels is limited to fill soil in a discrete area on the western portion of Thompson Field. The results from the RI Report confirmed that groundwater is not a medium of concern. Therefore, groundwater is not identified in the RI Report as an affected medium, and was not sampled during the additional characterization field program. The results from the Site-Specific Terrestrial Ecological Evaluation conducted for the Thompson Field Site determined that analytes detected in soil and groundwater at Thompson Field were not of ecological concern.

Farallon conducted supplemental subsurface investigation activities between July 2021 and January 2022 at the Thompson Field Site that consisted of:

- Advancing borings FB-30 through FB-53 to a maximum depth of 15 feet bgs using a limited-access direct-push drill rig;
- Collecting and analyzing soil samples for semivolatile organic compounds, including PAHs; and
- Monitoring groundwater levels at the Thompson Field monitoring well network monthly from July 23, 2021 to January 10, 2022, and on September 16, 2022 to evaluate groundwater elevations and flow directions.

Water levels measured in monitoring wells at the Thompson Field Site are shown in Table 1. The analytical results for PAHs are summarized in Table 2.

During the additional characterization field program, total cPAHs were detected at TECs exceeding the MTCA Method A cleanup level of 0.1 milligram per kilogram (mg/kg) in fill samples collected from borings on the western portion of Thompson Field at depths of 1 to 3 feet bgs (Figure 3; Table 2). Following completion of the supplemental soil sampling activities, the extent of total cPAHs at TECs exceeding the MTCA Method A cleanup level in soil was sufficiently delineated to adequately characterize the Thompson Field Site and evaluate cleanup action alternatives (Figure 6).

The additional characterization activities conducted by Farallon confirmed the conclusions stated in the RI Report, and provide the basis to select a cleanup remedy under MTCA regulations. The extent of total naphthalene concentrations and total cPAHs at TECs exceeding MTCA Method A cleanup levels is limited to fill soil in a discrete area on the western portion of Thompson Field, estimated to be less than 2 acres and limited to depths of 1 to 6 feet bgs. The results from the supplemental subsurface activities are provided in the letter regarding Addendum to RI Report (Farallon 2022).

Standing water on the surface of Thompson Field was not observed by Farallon during monthly groundwater measurement events conducted during the additional characterization field work.

This condition indicates that Ecology sediment cleanup standards would not be an applicable ARAR for the Thompson Field Site because surface soil is not inundated for 6 or more weeks per year, and therefore are not classified as sediments, as defined in WAC 173-204-505(22).

PAHs have not been detected at a concentration at or exceeding the laboratory practical quantitation limit in groundwater samples collected from down-gradient monitoring wells surrounding the Thompson Field Site, indicating that groundwater transport of PAHs is not occurring at the Thompson Field Site and PAHs are not reaching surface waters surrounding Thompson Field. Therefore, groundwater at the Site does not have a completed pathway to surface water or adjacent sediment.

3.0 TECHNICAL ELEMENTS

This section provides a discussion of the ARARs, the COCs, the medium of concern, exposure pathways, cleanup levels, and the point of compliance for the cleanup action.

3.1 APPLICABLE RELEVANT AND APPROPRIATE REQUIREMENTS

Applicable state, local, and federal laws and regulations provide the framework for the cleanup action. WAC 173-340-360(2) and 173-340-710(1)(a) require that cleanup actions conducted under MTCA comply with applicable federal and state laws. ARARs are defined as those requirements that are legally applicable and determined by Ecology to be both relevant and appropriate to the cleanup action. The ARARs that apply to the cleanup action likely will include the following:

- The Model Toxics Control Act, Chapter 70A.305 of the Revised Code of Washington (RCW 70A.305);
- MTCA implementing regulations (WAC 173-340);
- The State Environmental Policy Act (RCW 43.21);
- The requirements of King County, Washington pertinent to excavation, which may include filling and grading, erosion control, dust suppression, removal of trees and vegetation, noise control, a floodplain development permit, or other applicable requirements necessary to complete the cleanup action;
- The Washington State Hazardous Waste Management Act (RCW 70.105);
- The Clean Water Act (Chapter 26 of Title 33 of the U.S. Code) Section 401 (water quality certification for wetlands projects);
- Clean Water Act Section 404 (permitting of discharges of dredge or fill material);
- Washington State Water Pollution Control Act (RCW 90.48); and
- Washington State Shoreline Management Act (RCW 90.58).

These primary laws and regulations are anticipated to be most applicable to the cleanup action because they provide the framework for the action, including applicable and relevant regulatory guidelines, cleanup standards, waste disposal criteria, references to additional laws and regulations, and standards for documentation of the cleanup action.

Other potentially applicable laws and regulations pertinent to the cleanup and restoration of the Site include the following:

- Puget Sound Clean Air Agency General Regulations for Air Pollution Sources to mitigate creation of fugitive dust during grading and excavation work;
- The Occupational Safety and Health Act (Part 1910 of Title 29 of the Code of Federal Regulations;

- Safety Standards for Construction Work (WAC 296-155);
- Washington State Solid Waste Management Laws and Regulations (RCW 70.95; WAC 173-35 and 173-304); and
- Accreditation of Environmental Laboratories (WAC 174-50).

3.2 CONSTITUENTS OF CONCERN

The COCs for the Thompson Field Site are hazardous substances detected at concentrations exceeding MTCA cleanup levels in soil that are not the result of naturally occurring background concentrations. The COCs for soil at the Thompson Field Site are total naphthalenes and cPAHs.

3.3 MEDIUM OF CONCERN

The medium of concern for the Thompson Field Site is soil.

3.4 EXPOSURE PATHWAY

The potential exposure pathway for the Thompson Field Site is direct contact with soil. The direct contact exposure pathway consists of direct contact via dermal contact with and/or ingestion of soil.

3.5 CLEANUP LEVELS

MTCA Method A soil cleanup levels for unrestricted land use are appropriate for the contamination affecting the Thompson Field Site. The Thompson Field Site currently is a fallow hay field. Following completion of remedial activities, the Thompson Field Site will be allowed to revert to a natural state, and will remain open space as mandated by the anticipated development process.

The MTCA Method A cleanup level for cPAHs in soil at the Thompson Field Site is 0.1 mg/kg for total cPAH TEC.

The MTCA Method A cleanup level for total naphthalenes in soil at the Thompson Field Site is 5.0 mg/kg.

3.6 POINT OF COMPLIANCE

Points of compliance are the locations at which the cleanup level in soil must be attained to meet the requirements of MTCA. The point of compliance for soil is defined as all soil throughout the Thompson Field Site (the standard point of compliance under MTCA)

4.0 SELECTED CLEANUP ACTION

This section describes the cleanup action objective, the cleanup action, the restoration time frame, and the schedule for implementation.

4.1 CLEANUP ACTION OBJECTIVE

The cleanup action objective for the Site is to conduct a MTCA-compliant cleanup that will be protective of human health and the environment in an efficient, timely, and cost-effective manner to the maximum extent practicable, while minimizing impacts to the wetland areas of the Thompson Field Site.

4.2 CLEANUP ACTION DESCRIPTION

The selected cleanup action for the Thompson Field Site consists of excavation and off-site disposal of soil containing total naphthalenes at concentrations exceeding MTCA Method A cleanup levels and total cPAHs at a TEC exceeding MTCA Method A cleanup levels. The selected cleanup action is a Model Remedy as defined under WAC 173-340-390. Because the selected cleanup action meets the criteria for a Model Remedy, it is not necessary to conduct a feasibility study or a disproportionate cost analysis for the proposed cleanup for the Thompson Field Site, per WAC 173-340-390.

Model Remedy 1 under the Ecology (2015) guidance for *Model Remedies for Sites with Petroleum Contaminated Soils* is appropriate for sites where complete removal of contaminated soil will take place and MTCA Method A cleanup levels for unrestricted land uses are selected. Following excavation, confirmation testing must be performed to documents that applicable MTCA Method A cleanup levels have been met at the point of compliance such that no environmental covenants are necessary. The proposed cleanup action selected for the Thompson Field Site will meet these criteria.

An area of approximately 85,000 square feet of Thompson Field will be excavated for the cleanup action. The excavation area will include most of Wetland I and a small portion of Wetland H composing an area of approximately 24,985 square feet of Category III wetlands that will be disturbed during the cleanup activities. The restoration activities for the Project include beneficial creation and restoration of approximately 62,638 square feet of Category IV wetlands. Additional details of the wetland creation and restoration activities are provided in Section 4.2.4, Site Restoration, and in the *Critical Areas Report, Thompson Field Contamination Remediation and Wetland Enhancement Plan, Gunshy Manor, King County, Washington* dated July 1, 2022 prepared by Talasaea Consultants, Inc. (2022) (Critical Areas Report), provided in Appendix A. Additional details on the construction sequencing for the cleanup action and wetland restoration are provided in Chapter 6 of the Critical Areas Report.

4.2.1 Worker Health and Safety

A Health and Safety Plan (HASP) that meets the minimum requirements identified in federal (Parts 1910.120 and 1926 of Title 29 of the Code of Federal Regulations) and state (WAC 173-340-810) regulations will be prepared for the cleanup action. The purpose of the HASP is to outline site-specific health and safety requirements for the cleanup action. The HASP includes guidelines for Farallon personnel to reduce the potential for injury during implementation of the cleanup action. The HASP also includes site-specific incident preparedness and response procedures, emergency response and evacuation procedures, local and project emergency contact information, appropriate precautions for potential airborne contaminants and site hazards, and a description of expected characteristics of the waste generated by the cleanup action.

Construction workers encountering petroleum-contaminated soil will have completed 40-Hour Hazardous Waste Operations and Emergency Response training in accordance with Part 1910.120 of Title 29 of the Code of Federal Regulations, and will have completed Annual 8-Hour Hazardous Waste Operations and Emergency Response refresher training, as needed.

The general contractor and Estate personnel will monitor worker health and safety practices, including but not limited to:

- Controlling fugitive dust emissions during earthwork activities.
- Incorporating measures to prevent contaminated soil from being transported off the Thompson Field Site on vehicles and/or equipment used at the Site during earthwork activities and work in undeveloped/wetland areas.
- Conducting daily safety meetings and orientation of visitors to the Thompson Field Site to educate workers and visitors regarding daily work activities and the safety measures required to mitigate potential exposure to affected soil, and to mitigate potential transfer of soil contamination off the Thompson Field Site.

4.2.2 Soil Excavation and Disposal

An approximately 85,000-square-foot area will be excavated at the Thompson Field Site to a maximum depth of 7 feet bgs. An estimated 10,842 cubic yards (18,431 tons) of petroleum-contaminated soil will be removed from the excavation area, direct-loaded into trucks, and transported to a licensed Subtitle D landfill facility for disposal. A preliminary grading plan provided in Appendix B.

4.2.3 Compliance Monitoring

During soil excavation activities, field-screening and performance soil sampling will be conducted to guide the excavation. Performance soil samples will be analyzed for PAHs employing the methods presented in the Sampling and Analysis Plan (Appendix C). Once field-screening and performance soil sampling indicate that soil containing naphthalenes and cPAHs at concentrations exceeding MTCA Method A cleanup levels has been removed to the maximum extent practicable, confirmation soil samples will be collected from the base and sidewalls of the excavation to

confirm that excavation efforts have adequately removed soil containing COCs at concentrations exceeding MTCA Method A cleanup levels. Performance soil samples may be used as confirmation soil samples if concentrations of COCs in the samples do not exceed MTCA Method A cleanup levels. The confirmation soil sampling results will be used to assess when cleanup levels have been met at the limits of the excavation and whether additional soil removal will be required.

The complete soil sampling and analysis procedures to be implemented as part of the cleanup action are described in the Sampling and Analysis Plan (Appendix C).

Details on vegetation performance monitoring of the wetland restoration areas are provided in the Critical Areas Report (Appendix A). Performance monitoring of the restoration areas will be conducted over 5-year period, consistent with Section 24 of Title 21A of King County Code.

4.2.4 Site Restoration

Upon completion of the soil excavation activities, wetland creation and restoration activities will commence. Restoration activities will include grading along some of the adjacent edges of the excavation following contaminated soil removal; hydroseeding the area with wetland and upland grasses, sedges, and rushes; and planting of a variety of native shrubs and trees. Additional details of the wetland creation and restoration activities are provided in the Critical Areas Report (Appendix A).

4.3 RESTORATION TIME FRAME

It is anticipated that the cleanup action will achieve MTCA cleanup standards once the excavation activities have been completed, currently anticipated for 2023. Following removal of petroleum-contaminated soil, wetland creation and restoration activities will be completed to improve approximately 25,900 square feet of Category III wetlands (Wetlands H and I combined) to approximately 62,700 square feet of Category IV wetlands. The wetlands creation and restoration activities are anticipated to be completed in 2023 or 2024, with performance monitoring of the wetlands restoration areas to be conducted over a 5-year period.

4.4 SCHEDULE FOR IMPLEMENTATION

A specific project schedule has not yet been developed pending approval of this CAP by Ecology and submittal of an Ecology approval Opinion Letter. The Estate is anticipating that the project work will be initiated during the summer of 2023. A project schedule will be provided once the CAP has been approved and applicable permits obtained.

Elements of the cleanup action for the Thompson Field Site and development activities for the project have been initiated. A State Environmental Policy Act Environmental checklist addressing potential impacts of the project, including the cleanup action, has been submitted to King County for review. The Critical Areas Report (Appendix A) has been submitted to King County for review, and will be submitted to USACE as part of the Joint Aquatic Resources Permit Application for the project.

5.0 BIBLIOGRAPHY

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6.0 LIMITATIONS

6.1 GENERAL LIMITATIONS

The conclusions contained in this report/assessment are based on professional opinions with regard to the subject matter. These opinions have been arrived at in accordance with currently accepted hydrogeologic and engineering standards and practices applicable to this location. The conclusions contained herein are subject to the following inherent limitations:

- **Accuracy of Information**. Farallon obtained, reviewed, and evaluated certain information used in this report/assessment from sources that were believed to be reliable. Farallon's conclusions, opinions, and recommendations are based in part on such information. Farallon's services did not include verification of its accuracy or authenticity. Should the information upon which Farallon relied prove to be inaccurate or unreliable, Farallon reserves the right to amend or revise its conclusions, opinions, and/or recommendations.
- **Reconnaissance and/or Characterization**. Farallon performed a reconnaissance and/or characterization of the Thompson Field Site that is the subject of this report/assessment to document current conditions. Farallon focused on areas deemed more likely to exhibit hazardous materials conditions. Contamination may exist in other areas of the Thompson Field Site that were not investigated or were inaccessible. Site activities beyond Farallon's control could change at any time after the completion of this report/assessment.

For the foregoing reasons, Farallon cannot and does not warrant or guarantee that the Thompson Field Site is free of hazardous or potentially hazardous substances or conditions, or that latent or undiscovered conditions will not become evident in the future. Farallon's observations, findings, and opinions can be considered valid only as of the date of the report.

This report/assessment has been prepared in accordance with the contract for services between Farallon and the Estate of Barbara J. Nelson and WCN GST Non-Exempt Marital Trust No. 2, and currently accepted industry standards. No other warranties, representations, or certifications are made.

6.2 LIMITATION ON RELIANCE BY THIRD PARTIES

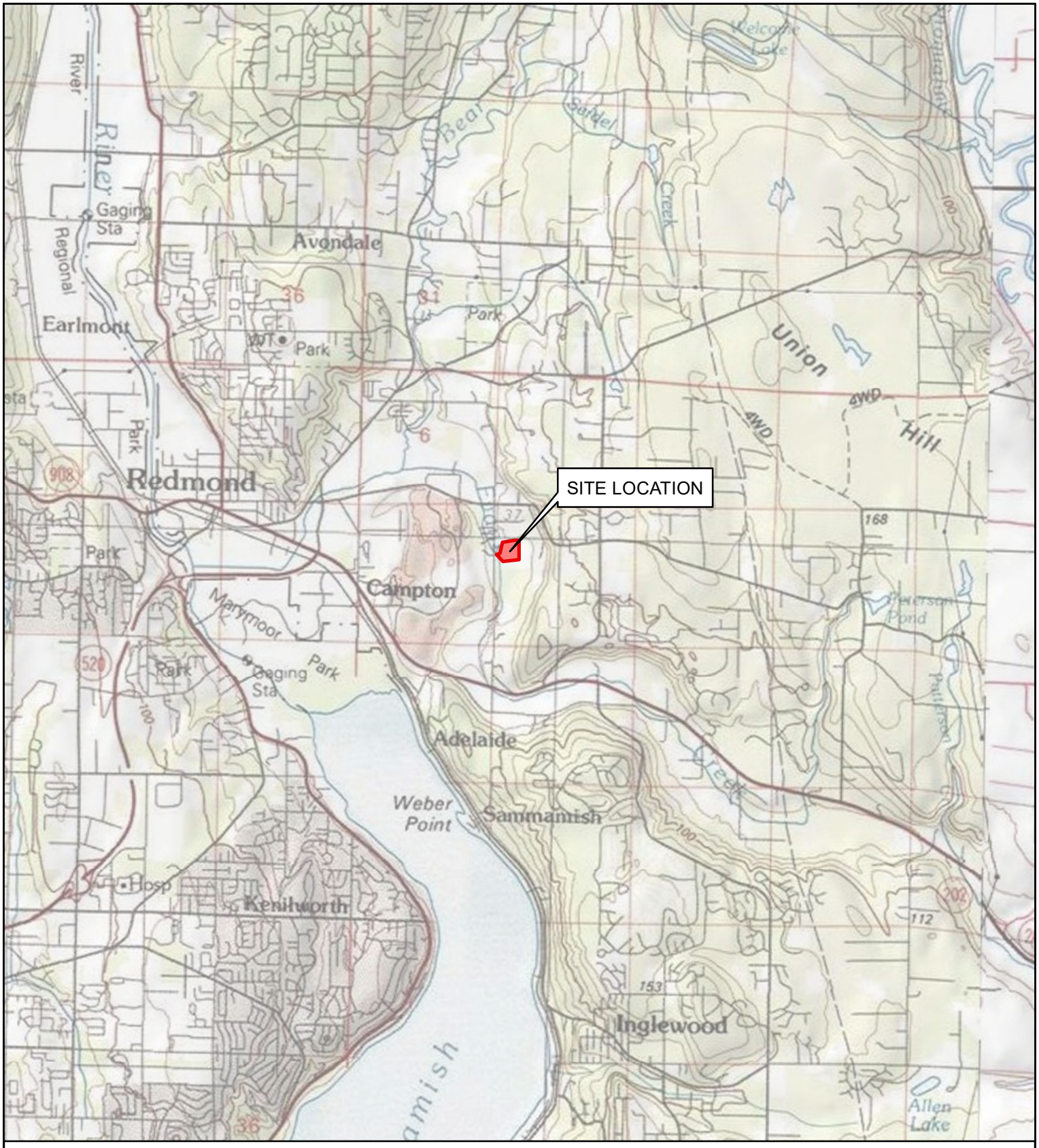
Reliance by third parties is prohibited. This report/assessment has been prepared for the exclusive use of the Estate of Barbara J. Nelson and WCN GST Non-Exempt Marital Trust No. 2 to address the unique needs of the Estate of Barbara J. Nelson and WCN GST Non-Exempt Marital Trust No. 2 at the Thompson Field Site at a specific point in time.

This is not a general grant of reliance. No one other than the Estate of Barbara J. Nelson and WCN GST Non-Exempt Marital Trust No. 2 may rely on this report unless Farallon agrees in advance to such reliance in writing. Any unauthorized use, interpretation, or reliance on this report/assessment is at the sole risk of that party, and Farallon will have no liability for such unauthorized use, interpretation, or reliance.

FIGURES

CLEANUP ACTION PLAN
Thompson Field
Portion of King County Parcel No. 0825069104
Redmond, Washington

Farallon PN: 650-031



REFERENCE: 7.5 MINUTE USGS QUADRANGLE REDMOND, WASHINGTON, DATED 2013

0 5,000
SCALE IN FEET

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FIGURE 1

SITE VICINITY MAP
THOMPSON FIELD
PORTION OF KING COUNTY
PARCEL NUMBER 0825069104
REDMOND, WASHINGTON

FARALLON PN: 650-031

Drawn By: lmurock Checked By: SB Date: 10/4/2022 Disc Reference:

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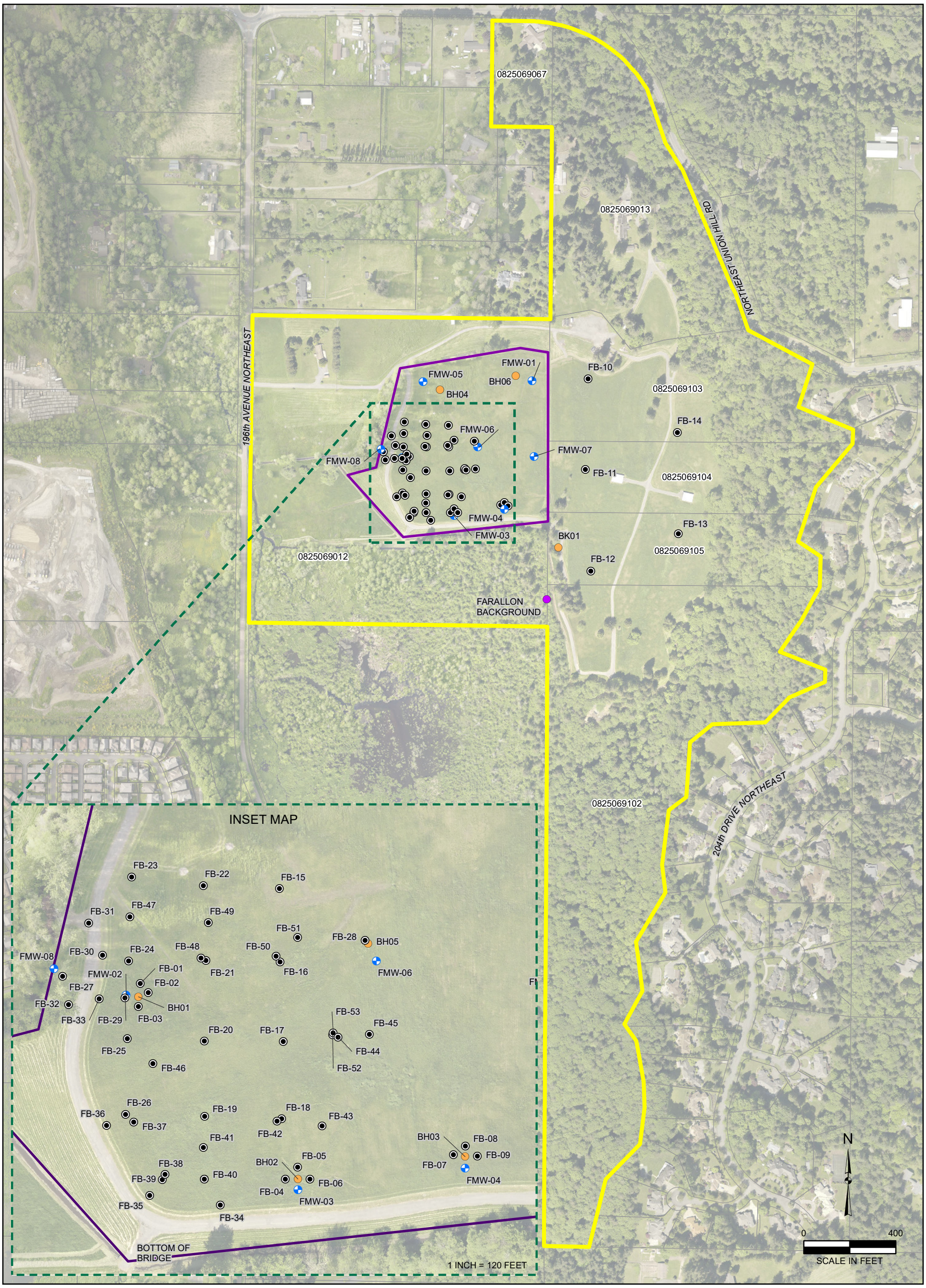

LEGEND

- MONITORING WELL (FARALLON, 2020)
- BORING (FARALLON, 2020)
- BORING (ECOLOGY & ENVIRONMENT, INC, 2019)
- BACKGROUND GRAB SAMPLE (FARALLON, 2019)
- THOMPSON FIELD BOUNDARY
- PROPERTY BOUNDARY
- KING COUNTY PARCEL BOUNDARY

0825069012 = KING COUNTY PARCEL NUMBER

NOTES:
1. ALL LOCATIONS ARE APPROXIMATE.
2. FIGURES WERE PRODUCED IN COLOR. GRAYSCALE COPIES MAY NOT REPRODUCE ALL ORIGINAL INFORMATION.

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FIGURE 2

PROPERTY PLAN
THOMPSON FIELD
PORTION OF KING COUNTY
PARCEL NUMBER 0825069104
REDMOND, WASHINGTON

FARALLON PN: 650-031

Drawn By: lmurock | Checked By: SB | Date: 10/4/2022 | Disc Reference:

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LEGEND

- MONITORING WELL (FARALLON, 2020)
- BORING (FARALLON)
- BORING (ECOLOGY & ENVIRONMENT, INC, 2019)
- EXCAVATION CONTOUR (DEPTH IN FEET BGS)
- ESTIMATED SITE BOUNDARY
- SOIL WITH cPAH TECs ABOVE MTCA METHOD A CLEANUP LEVEL
- WETLAND
- THOMPSON FIELD BOUNDARY
- PROPERTY BOUNDARY
- A A' CROSS-SECTION

NOTES:
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FIGURE 3

SITE FIGURE
THOMPSON FIELD
PORTION OF KING COUNTY
PARCEL NUMBER 0825069104
REDMOND, WASHINGTON

FARALLON PN: 650-031

Drawn By: lmurock | Checked By: SB | Date: 10/4/2022 | Disc Reference:

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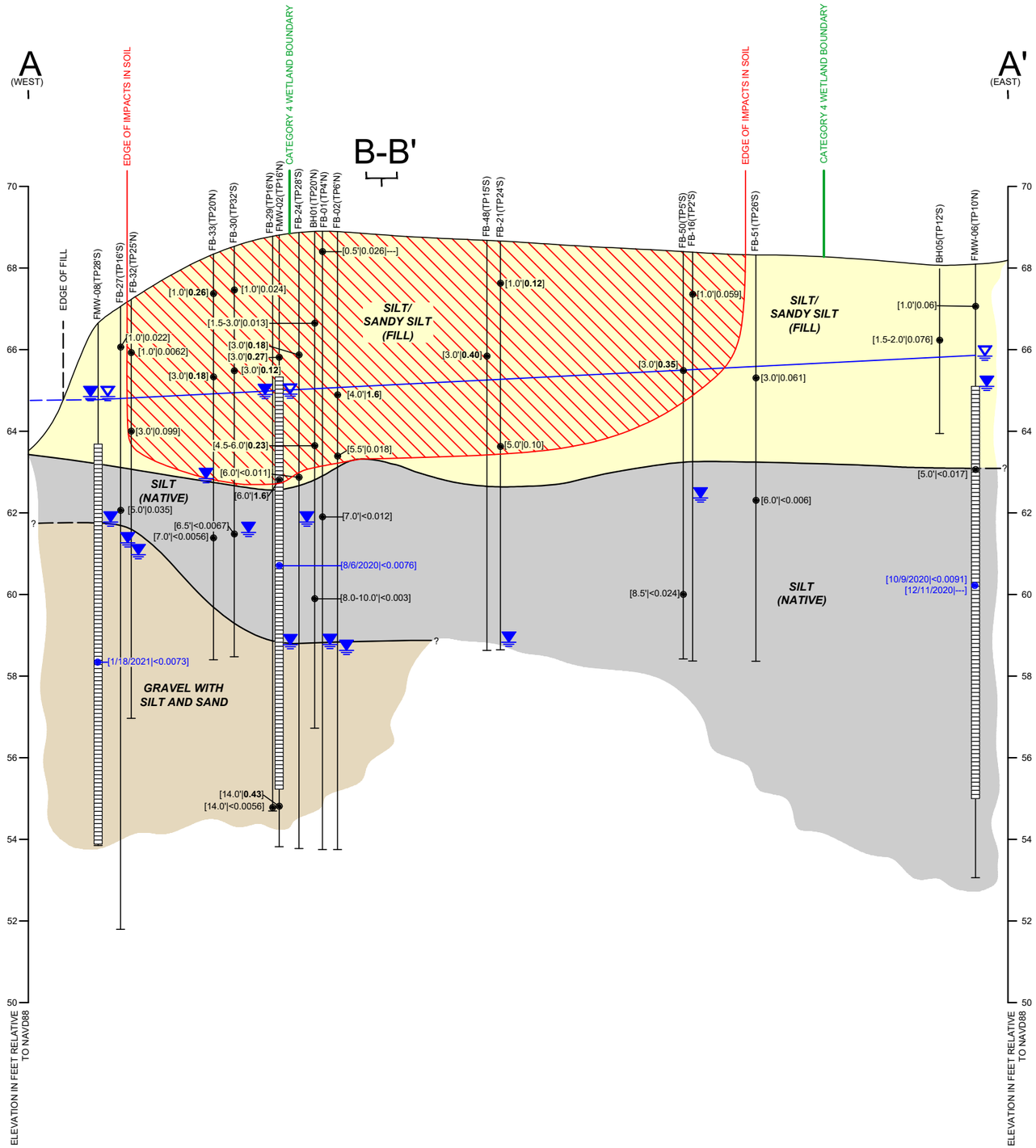

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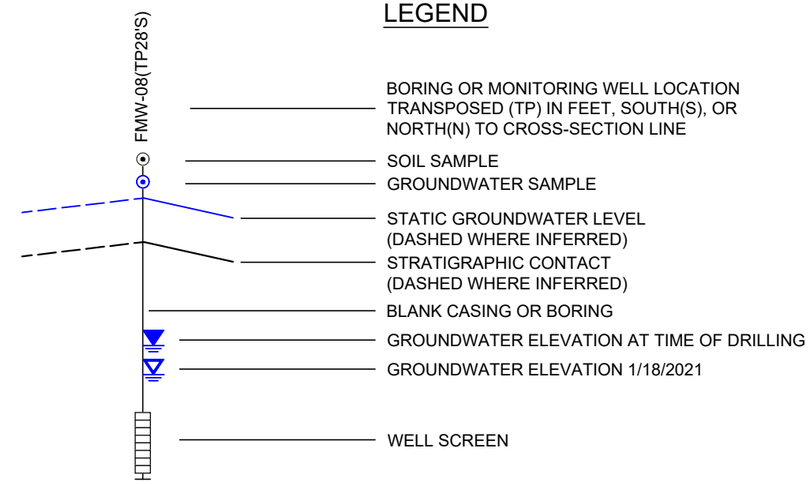

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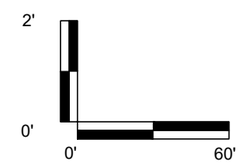
[1/18/2021|<0.0073]	=	GROUNDWATER ANALYTICAL RESULT [DATE|TOTAL CPAHs TEC] IN MICROGRAMS PER LITER
<	=	INDICATES CONCENTRATIONS NOT DETECTED AT OR EXCEEDING THE STATED LABORATORY PRACTICAL QUANTITATION LIMIT
---	=	SAMPLE NOT ANALYZED
BOLD	=	INDICATES CONCENTRATIONS EXCEEDING MTCA METHOD A CLEANUP LEVEL
MTCA	=	WASHINGTON STATE MODEL TOXICS CONTROL ACT CLEANUP REGULATION
NAVD88	=	NORTH AMERICAN VERTICAL DATUM OF 1988
BGS	=	BELOW GROUND SURFACE
CPAHs	=	CARCINOGENIC POLYCYCLIC AROMATIC HYDROCARBONS
TEC	=	TOXIC EQUIVALENT CONCENTRATION
	=	APPROXIMATE AREA OF SOIL WHERE CPAH TECS EXCEED MTCA METHOD A CLEANUP LEVELS



NOTES:
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FIGURE 4

CROSS SECTION A-A'
THOMPSON FIELD
PORTION OF KING COUNTY PARCEL NUMBER 0825069104
REDMOND, WASHINGTON

FARALLON PN: 650-031

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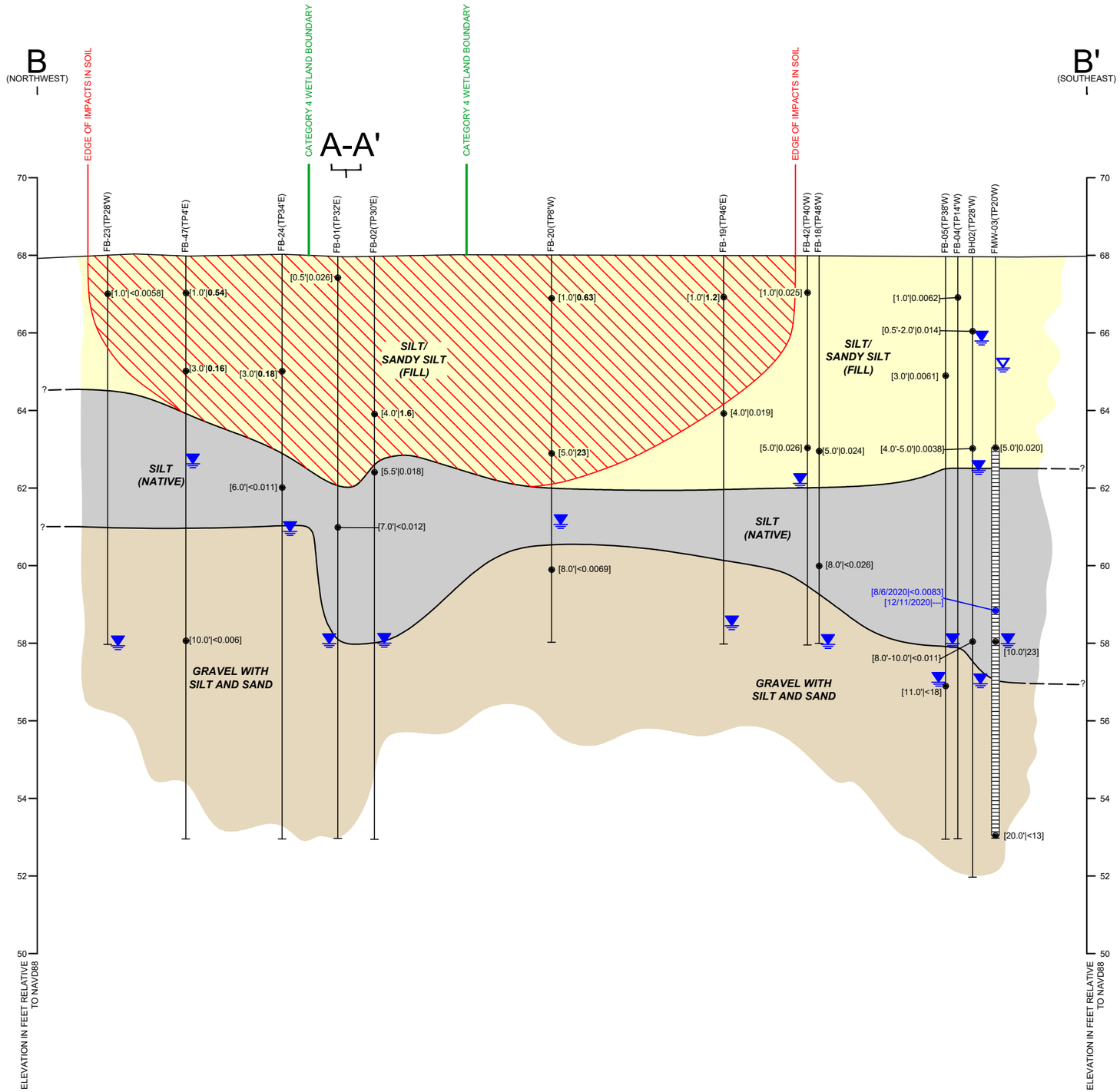

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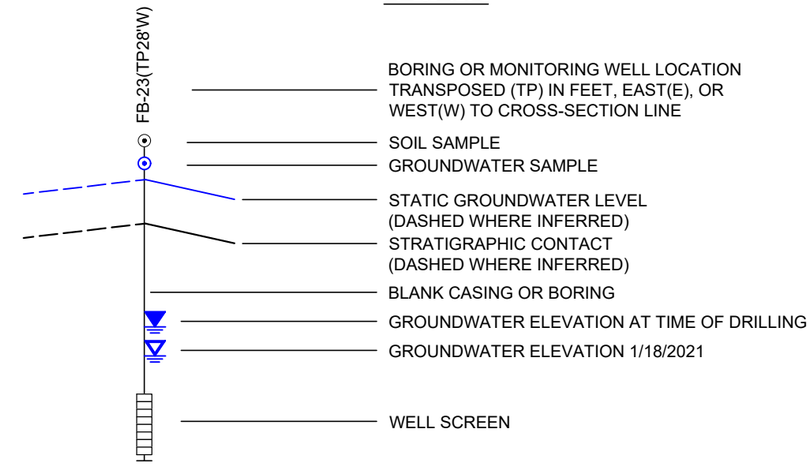

[8.0'|<0.026]	=	SOIL ANALYTICAL RESULT [DEPTH IN FEET BGS|TOTAL CPAHs TECIN MILLIGRAMS PER KILOGRAM
[12/11/2020|---]	=	GROUNDWATER ANALYTICAL RESULT [DATE|TOTAL CPAHs TEC] IN MICROGRAMS PER LITER
<	=	INDICATES CONCENTRATIONS NOT DETECTED AT OR EXCEEDING THE STATED LABORATORY PRACTICAL QUANTITATION LIMIT
---	=	SAMPLE NOT ANALYZED
BOLD	=	INDICATES CONCENTRATIONS EXCEEDING MTCA METHOD A CLEANUP LEVEL
MTCA	=	WASHINGTON STATE MODEL TOXICS CONTROL ACT CLEANUP REGULATION
NAVD88	=	NORTH AMERICAN VERTICAL DATUM OF 1988
BGS	=	BELOW GROUND SURFACE
CPAHs	=	CARCINOGENIC POLYCYCLIC AROMATIC HYDROCARBONS
TEC	=	TOXIC EQUIVALENT CONCENTRATION
	=	APPROXIMATE AREA OF SOIL WHERE CPAH TECS EXCEED MTCA METHOD A CLEANUP LEVELS

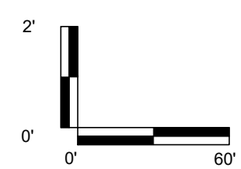

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FIGURE 5

CROSS SECTION B-B'
THOMPSON FIELD
PORTION OF KING COUNTY PARCEL NUMBER 0825069104
REDMOND, WASHINGTON

FARALLON PN: 650-031

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NOTES:
SOIL RESULTS SHOWN AS
DEPTH IN FEET BGS | cPAH TEC | TOTAL NAPHTHALENES
SOIL ANALYTICAL RESULTS IN MILLIGRAMS PER KILOGRAM

BOLD = DENOTES CONCENTRATIONS THAT EXCEED THE WASHINGTON STATE MODEL TOXICS CONTROL ACT CLEANUP REGULATION (MTCA) CLEANUP LEVEL
< = ANALYTE NOT DETECTED AT OR EXCEEDING THE REPORTING LIMIT LISTED
BGS = BELOW GROUND SURFACE
cPAH TEC = CARCINOGENIC POLYCYCLIC AROMATIC HYDROCARBON TOXIC EQUIVALENT CONCENTRATION
TOTAL NAPHTHALENES = SUM OF NAPHTHALENE, 1-METHYLNAPHTHALENE, AND 2-METHYLNAPHTHALENE

LEGEND

- MONITORING WELL (FARALLON, 2020)
- BORING (FARALLON)
- BORING (ECOLOGY & ENVIRONMENT, INC, 2019)
- EXCAVATION CONTOUR (DEPTH IN FEET BGS)
- ESTIMATED SITE BOUNDARY
- SOIL WITH cPAH TECs ABOVE MTCA METHOD A CLEANUP LEVEL
- WETLAND
- THOMPSON FIELD BOUNDARY
- PROPERTY BOUNDARY

NOTES:
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FIGURE 6

SOIL ANALYTICAL RESULTS FOR cPAH TEC AND TOTAL NAPHTHALENES
THOMPSON FIELD
PORTION OF KING COUNTY
PARCEL NUMBER 0825069104
REDMOND, WASHINGTON

Drawn By: jjones | Checked By: SB | Date: 2/23/2022 | FARALLON PN: 650-031 | Disc Reference:

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TABLES

CLEANUP ACTION PLAN
Thompson Field
Portion of King County Parcel No. 0825069104
Redmond, Washington

Farallon PN: 650-031

Table 1
Groundwater Elevations
Thompson Field
Portion of King County Parcel No. 0825069104
Redmond, Washington
Farallon PN: 650-031

Location	Top of Casing Elevation (feet NAVD88)[1]	Monitoring Date	Depth to Water (feet)[2]	Water Level Elevation (feet NAVD88)[1]
FMW-01	66.45	8/6/2020	6.60	59.85
		10/9/2020	6.33	60.12
		11/9/2020	5.61	60.84
		11/30/2020	5.20	61.25
		12/11/2020	5.31	61.14
		1/8/2021	3.50	62.95
		1/18/2021	3.96	62.49
		7/23/2021	6.67	59.78
		10/14/2021	6.42	60.03
		11/15/2021	4.12	62.33
		12/13/2021	4.57	61.88
		1/10/2022	2.80	63.65
		9/16/2022	6.21	60.24
FMW-02	68.80	8/6/2020	5.18	63.62
		10/9/2020	4.94	63.86
		11/9/2020	4.64	64.16
		11/30/2020	4.48	64.32
		12/11/2020	4.46	64.34
		1/8/2021	3.73	65.07
		1/18/2021	3.98	64.82
		7/23/2021	5.30	63.50
		10/14/2021	5.02	63.78
		11/15/2021	3.88	64.92
		12/13/2021	4.17	64.63
		1/10/2022	3.38	65.42
		9/16/2022	5.26	63.54
FMW-03	67.90	8/6/2020	3.95	63.95
		10/9/2020	3.64	64.26
		11/9/2020	3.36	64.54
		11/30/2020	3.20	64.70
		12/11/2020	3.17	64.73
		1/8/2021	2.51	65.39
		1/18/2021	2.74	65.16
		7/23/2021	3.97	63.93
		10/14/2021	3.71	64.19
		11/15/2021	2.64	65.26
		12/13/2021	2.92	64.98
		1/10/2022	2.19	65.71
		9/16/2022	3.97	63.93

Table 1
Groundwater Elevations
Thompson Field
Portion of King County Parcel No. 0825069104
Redmond, Washington
Farallon PN: 650-031

Location	Top of Casing Elevation (feet NAVD88)[1]	Monitoring Date	Depth to Water (feet)[2]	Water Level Elevation (feet NAVD88)[1]
FMW-04	68.09	8/6/2020	4.28	63.81
		10/9/2020	4.06	64.03
		11/9/2020	3.76	64.33
		11/30/2020	3.59	64.50
		12/11/2020	3.55	64.54
		1/8/2021	2.55	65.54
		1/18/2021	3.06	65.03
		7/23/2021	4.41	63.68
		10/14/2021	4.14	63.95
		11/15/2021	3.01	65.08
		12/13/2021	3.30	64.79
		1/10/2022	2.49	65.60
		9/16/2022	4.36	63.73
FMW-05	68.83	10/9/2020	6.01	62.82
		11/9/2020	5.61	63.22
		11/30/2020	5.36	63.47
		12/11/2020	5.41	63.42
		1/8/2021	4.39	64.44
		1/18/2021	4.67	64.16
		7/23/2021	6.37	62.46
		10/14/2021	6.00	62.83
		11/15/2021	4.55	64.28
		12/13/2021	4.99	63.84
		1/10/2022	3.88	64.95
		9/16/2022	6.26	62.57
FMW-06	68.21	10/9/2020	3.00	65.21
		11/9/2020	2.66	65.55
		11/30/2020	2.28	65.93
		12/11/2020	2.26	65.95
		1/8/2021	1.15	67.06
		1/18/2021	2.23	65.98
		7/23/2021	3.84	64.37
		10/14/2021	4.46	63.75
		11/15/2021	2.73	65.48
		12/13/2021	3.13	65.08
		1/10/2022	2.40	65.81
		9/16/2022	3.59	64.62

Table 1
Groundwater Elevations
Thompson Field
Portion of King County Parcel No. 0825069104
Redmond, Washington
Farallon PN: 650-031

Location	Top of Casing Elevation (feet NAVD88)[1]	Monitoring Date	Depth to Water (feet)[2]	Water Level Elevation (feet NAVD88)[1]
FMW-07	66.04	10/9/2020	3.01	63.03
		11/9/2020	2.22	63.82
		11/30/2020	1.92	64.12
		12/11/2020	2.03	64.01
		1/8/2021	1.96	64.08
		1/18/2021	2.11	63.93
		7/23/2021	3.91	62.13
		10/14/2021	3.11	62.93
		11/15/2021	1.48	64.56
		12/13/2021	1.80	64.24
		1/10/2022	1.71	64.33
		9/16/2022	4.26	61.78
FMW-08	66.68	1/18/2021	1.91	64.77
		7/23/2021	3.21	63.47
		10/14/2021	2.93	63.75
		11/15/2021	1.77	64.91
		12/13/2021	2.06	64.62
		1/10/2022	1.60	65.08
		9/16/2022	3.38	63.30
Surface Water				
Bottom of Bridge	67.00	12/11/2020	5.15	61.85
		1/8/2021	4.74	62.26
		1/18/2021	5.10	61.90
		7/23/2021	5.67	61.33
		10/14/2021	5.38	61.62
		11/15/2021	4.72	62.28
		12/13/2021	4.88	62.12
		1/10/2022	4.30	62.70
		9/16/2022	5.40	61.60
West Culvert	62.44	12/11/2020	--	--
		1/8/2021	0.85	61.59
		1/18/2021	1.15	61.29
		7/23/2021	1.49	60.95
		10/14/2021	0.34	62.10
		11/15/2021	0.90	61.54
		12/13/2021	0.23	62.21
		1/10/2022	1.79	60.65
		9/16/2022	1.48	60.96

Table 1
Groundwater Elevations
Thompson Field
Portion of King County Parcel No. 0825069104
Redmond, Washington
Farallon PN: 650-031

Location	Top of Casing Elevation (feet NAVD88)[1]	Monitoring Date	Depth to Water (feet)[2]	Water Level Elevation (feet NAVD88)[1]
North Culvert	62.54	12/11/2020	2.31	60.23
		1/8/2021	2.15	60.39
		1/18/2021	2.35	60.19
		7/23/2021	2.75	59.79
		10/14/2021	2.80	59.74
		11/15/2021	2.71	59.83
		12/13/2021	2.45	60.09
		1/10/2022	0.40	62.14
		9/16/2022	2.80	59.74

Notes:
[1] In feet referenced to North American Vertical Datum of 1988 (NAVD88).
[2] In feet below top of well casing.

Table 2
Soil Analytical Results for PAHs
Thompson Field
Portion of King County Parcel No. 0825069104
Redmond, Washington
Farallon PN: 650-031

Sample Location	Sample Identification	Sample Depth (feet)[1]	Sample Date	Analytical Results (milligrams per kilogram)[2]																			
				Non-Carcinogenic PAHs												Carcinogenic PAHs							
				Naphthalene	1-Methylnaphthalene	2-Methylnaphthalene	Total Naphthalenes[3]	Acenaphthene	Acenaphthylene	Anthracene	Benzo(g,h,i)Perylene	Fluoranthene	Fluorene	Phenanthrene	Pyrene	Benzo(a)Pyrene	Benzo(a)Anthracene	Benzo(b)Fluoranthene	Benzo(j,k)Fluoranthene	Chrysene	Dibenzo(a,h)Anthracene	Indeno(1,2,3-cd)Pyrene	Total cPAHs TEC[4,5]
BK01	BK01SB01	2.5-3.0	10/23/2019	< 0.0041	---	< 0.0041	< 0.0082	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0031
	BK01SB02	4.5-6.0	10/23/2019	< 0.0041	---	< 0.0041	< 0.0082	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0031
	BK01SB03	8.0-10	10/23/2019	< 0.0042	---	< 0.0042	< 0.0084	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0032
BH01	BH01SB01	1.5-3.0	10/23/2019	0.0026 J	---	0.0011 J	0.0037	0.0042	< 0.0039	0.0062	0.0064	0.025	0.005	0.026	0.022	0.010	0.0099	0.013	0.0041	0.0093	0.0014 J	0.0055	0.013
	BH01SB02	4.5-6.0	10/23/2019	0.14	---	0.033	0.173	0.077	0.0035 J	0.12	0.089	0.58 J	0.12	0.61	0.55	0.16	0.23	0.23	0.061	0.24	0.031	0.082	**0.23**
	BH01SB03	8.0-10.0	10/23/2019	< 0.004	---	< 0.004	< 0.008	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.003
BH02	BH02SB01	0.5-2.0	10/23/2019	0.0055	---	0.006	0.0115	0.0046	0.0038 J	0.009	0.0067	0.043	0.0081	0.053	0.0310	0.0096	0.019	0.016	0.0041	0.024	0.0019 J	0.0048	0.014
	BH02SB02	4.0-5.0	10/23/2019	0.0011 J	---	< 0.0051	0.0011	0.0013 J	< 0.0051	< 0.0051	< 0.0051	0.0016 J	0.0012 J	0.0026 J	0.0015 J	< 0.0051	< 0.0051	0.0017 J	< 0.0051	0.0013 J	< 0.0051	< 0.0051	0.0038
	BH02SB03	8.0-10.0	10/23/2019	< 0.014	---	< 0.014	< 0.028	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.011
BH03	BH03SB01	1.5-3.0	10/23/2019	0.0054	---	0.0064	0.0118	0.0095	< 0.0037	0.013	0.0018 J	0.026	0.011	0.032	0.021	0.0036 J	0.007	0.0054	0.0019 J	0.0048	< 0.0037	0.0018 J	0.0054
	BH03SB02	4.5-6.0	10/23/2019	0.0023 J	---	0.0020 J	0.0043	< 0.0065	< 0.0065	< 0.0065	< 0.0065	< 0.0065	< 0.0065	< 0.0065	< 0.0065	< 0.0065	< 0.0065	< 0.0065	< 0.0065	< 0.0065	< 0.0065	< 0.0065	< 0.0049
BH04	BH04SB01	0.5-1.0	11/6/2019	< 0.0039	---	< 0.0039	< 0.0078	< 0.0039	< 0.0039	< 0.0039	0.0010 J	0.0025 J	< 0.0039	0.0021 J	0.0032 J	0.0012 J	0.0016 J	0.0017 J	0.0011 J	0.0017 J	< 0.0039	0.0008 J	0.0019
	BH04SB02	2.0-2.5	11/6/2019	0.0010 J	---	0.0010 J	0.0020	< 0.0038	< 0.0038	0.0012 J	0.0025 J	0.0028 J	0.0009 J	0.0027 J	0.0038	0.0021 J	0.0022 J	0.0030 J	0.0021 J	0.0031 J	0.0014 J	0.0020 J	0.0032
BH05	BH05SB01	1.5-2.0	11/6/2019	0.0085	---	0.0049	0.0134	0.0042	0.0056	0.012	0.039	0.11	0.0032 J	0.051	0.14	0.054	0.068	0.078	0.025	0.072	0.009	0.031	0.076
	BH05SB02	1.5-2.0	11/6/2019	0.002 J	---	0.0018 J	0.0038	0.0032 J	0.0017 J	0.0066	0.014	0.038	0.0022 J	0.032	0.054	0.019	0.02	0.021	0.0081	0.023	0.0031	0.011	0.026
BH06	BH06SB01	1.0-1.8	11/6/2019	< 0.0040	---	< 0.0040	< 0.0080	< 0.0040	< 0.0040	< 0.0040	0.0035 J	0.0062	< 0.0040	0.0036 J	0.0094	0.0047	0.0044	0.0057	0.0022 J	0.0049	0.0009 J	0.0027 J	0.0063
	BH06SB02	2.5-3.0	11/6/2019	< 0.0037	---	< 0.0037	< 0.0074	< 0.0037	< 0.0037	< 0.0037	0.0012 J	0.0024 J	< 0.0037	0.0014 J	0.0042	0.0018 J	0.0019 J	0.0024 J	0.0011 J	0.0021 J	< 0.0037	0.0010 J	0.0026
FB-01	FB-01-0.5	0.5	7/30/2020	0.0079	< 0.0074	< 0.0074	0.0079	< 0.0074	< 0.0074	< 0.0074	0.013	0.034	< 0.0074	0.028	0.033	0.020	0.017	0.022	< 0.0074	0.019	< 0.0074	0.013	0.026
	FB-01-7.0	7.0	7/30/2020	< 0.016	< 0.016	< 0.016	< 0.048	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016	< 0.012
FB-02	FB-02-4.0	4.0	7/30/2020	4.6	1.4	2.0	**8.0**	3.0	0.045	1.4	0.59	5.7	3.2	9.5	4.3	1.2	1.6	1.2	0.49	1.5	0.13	0.60	**1.6**
	FB-02-5.5	5.5	7/30/2020	0.17	< 0.018	< 0.018	0.17	< 0.018	< 0.018	< 0.018	0.019	0.04	0.025	0.044	0.033	< 0.018	< 0.018	0.037	< 0.018	0.028	< 0.018	0.019	0.018
FB-03	FB-03-1.0	1.0	7/30/2020	0.025	0.0084	0.018	0.0514	0.034	0.010	0.069	0.12	0.40	0.029	0.29	0.40	0.21	0.20	0.21	0.077	0.20	0.025	0.13	**0.28**
	FB-03-6.0	6.0	7/30/2020	2.1	0.18	0.25	2.5	0.12	< 0.019	0.028	0.023	0.12	0.074	0.17	0.082	0.022	0.037	0.044	< 0.019	0.042	< 0.019	0.023	0.035
FB-04	FB-04-1.0	1.0	7/30/2020	< 0.0077	< 0.0077	< 0.0077	< 0.0231	< 0.0077	< 0.0077	< 0.0077	< 0.0077	0.0098	< 0.0077	< 0.0077	0.0097	< 0.0077	< 0.0077	0.0079	< 0.0077	< 0.0077	< 0.0077	< 0.0077	0.0062
FB-05	FB-05-3.0	3.0	7/30/2020	< 0.0075	< 0.0075	< 0.0075	< 0.0225	< 0.0075	< 0.0075	< 0.0075	< 0.0075	0.012	< 0.0075	0.0085	0.012	< 0.0075	< 0.0075	0.0077	< 0.0075	< 0.0075	< 0.0075	< 0.0075	0.0061
FB-06	FB-06-6.0	6.0	7/30/2020	< 0.031	0.036	< 0.031	0.036	0.10	< 0.031	0.037	< 0.031	0.10	0.15	0.28	0.055	< 0.031	< 0.031	< 0.031	< 0.031	< 0.031	< 0.031	< 0.031	< 0.023
FB-07	FB-07-5.0	5.0	7/31/2020	0.041	0.028	0.031	0.10	< 0.0086	< 0.0086	< 0.0086	< 0.0086	< 0.0086	< 0.0086	0.016	< 0.0086	< 0.0086	< 0.0086	< 0.0086	< 0.0086	< 0.0086	< 0.0086	< 0.0086	< 0.0065
FB-08	FB-08-5.5	5.5	7/31/2020	< 0.026	< 0.026	< 0.026	< 0.078	< 0.026	< 0.026	< 0.026	< 0.026	< 0.026	< 0.040 U1	< 0.026	< 0.026	< 0.026	< 0.026	< 0.026	< 0.026	< 0.026	< 0.026	< 0.026	< 0.020
FB-09	FB-09-5.0	5.0	7/31/2020	0.031	0.031	0.049	0.11	0.068	< 0.0079	0.017	< 0.0079	0.039	0.081	0.19	0.030	< 0.0079	< 0.0079	< 0.0079	< 0.0079	0.0079	< 0.0079	< 0.0079	0.0060
FB-16	FB-16-1.0	1.0	9/30/2020	< 0.0079	< 0.0079	< 0.0079	< 0.0237	< 0.0079	< 0.0079	0.0088	0.038	0.083	< 0.0079	0.041	0.078	0.052	0.040	0.073	0.017	0.051	< 0.0079	0.042	0.059
FB-17	FB-17-1.0	1.0	9/30/2020	0.094	< 0.0081	< 0.0081	0.094	< 0.0081	0.0087	0.023	0.052	0.13	< 0.0081	0.024	0.12	0.091	0.093	0.13	0.030	0.079	0.010	0.058	**0.13**
	FB-17-5.0	5.0	9/30/2020	0.21	0.12	0.14	0.47	0.26	0.0083	0.22	0.13	0.81	0.32	0.96	0.76	0.26	0.28	0.28	0.073	0.29	0.029	0.14	**0.36**
	FB-17-9.0	9.0	9/30/2020	< 0.030	< 0.030	< 0.030	< 0.090	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.023
FB-18	FB-18-5.0	5.0	9/30/2020	0.013	0.0096	0.011	0.0336	0.0077	< 0.0076	< 0.0076	0.0082	0.031	< 0.0076	0.023	0.035	0.018	0.020	0.020	< 0.0076	0.021	< 0.0076	0.0095	0.024
	FB-18-8.0	8.0	9/30/2020	< 0.035	< 0.035	< 0.035	< 0.105	< 0.035	< 0.035	< 0.035	< 0.035	< 0.035	< 0.035	< 0.035	< 0.035	< 0.035	< 0.035	< 0.035	< 0.035	< 0.035	< 0.035	< 0.035	< 0.026
FB-19	FB-19-1.0	1.0	9/30/2020	0.024	< 0.0083	< 0.0083	0.024	< 0.0083	0.084	0.24	0.29	0.92	0.020	0.086	0.99	0.68	0.93	0.92	0.28	1.0	0.076	0.39	**1.2**
	FB-19-4.0	4.0	9/30/2020	0.028	0.022	0.025	0.028	0.013	< 0.0075	0.0080	0.0089	0.029	0.018	0.046	0.035	0.014	0.014	0.015	< 0.0075	0.015	< 0.0075	0.0083	0.019
FB-20	FB-20-1.0	1.0	9/30/2020	0.11	< 0.036	< 0.036	0.11	0.052	0.042	0.19	0.23	1.3	0.058	0.58	1.1	0.46	0.61	0.52	0.18	0.56	0.050	0.24	**0.63**
	FB-20-5.0	5.0	9/30/2020	91	23	39	**153**	110	3.2	64	7.4	110	86	250	84	17	27	19	6.1	21	< 2.0	7.3	**23**
	FB-20-8.0	8.0	9/30/2020	< 0.0091	< 0.0091	< 0.0091	< 0.0273	< 0.0091	< 0.0091	< 0.0091	< 0.0091	< 0.0091	< 0.0091	< 0.0091	< 0.0091	< 0.0091	< 0.0091	< 0.0091	< 0.0091	< 0.0091	< 0.0091	< 0.0091	< 0.0069
MTCA Method A Cleanup Level for Soil[6]							**5**	**4,800[7]**	**NE**	**24,000[7]**	**NE**	**3,200[7]**	**3,200[7]**	**NE**	**2,400[7]**								**0.1**

Table 2
Soil Analytical Results for PAHs
Thompson Field
Portion of King County Parcel No. 0825069104
Redmond, Washington
Farallon PN: 650-031

Sample Location	Sample Identification	Sample Depth (feet)[1]	Sample Date	Analytical Results (milligrams per kilogram)[2]																			
				Non-Carcinogenic PAHs												Carcinogenic PAHs							
				Naphthalene	1-Methylnaphthalene	2-Methylnaphthalene	Total Naphthalenes[3]	Acenaphthene	Acenaphthylene	Anthracene	Benzo(g,h,i)Perylene	Fluoranthene	Fluorene	Phenanthrene	Pyrene	Benzo(a)Pyrene	Benzo(a)Anthracene	Benzo(b)Fluoranthene	Benzo(j,k)Fluoranthene	Chrysene	Dibenzo(a,h)Anthracene	Indeno(1,2,3-cd)Pyrene	Total cPAHs TEC[4,5]
FB-21	FB-21-1.0	1.0	9/30/2020	0.084	< 0.038	< 0.038	0.084	< 0.038	< 0.038	0.046	0.063	0.18	< 0.038	0.13	0.16	0.094	0.076	0.12	< 0.038	0.11	< 0.038	0.052	**0.12**
	FB-21-5.0	5.0	9/30/2020	0.027	0.0087	0.011	0.0467	0.016	< 0.0076	0.031	0.053	0.17	0.016	0.13	0.18	0.079	0.073	0.078	0.029	0.075	0.0096	0.047	0.10
FB-22	FB-22-1.0	1.0	9/30/2020	0.023	< 0.0074	< 0.0074	< 0.0074	< 0.0074	< 0.0074	< 0.0074	< 0.0074	0.0076	< 0.0074	< 0.0074	0.0077	< 0.0074	< 0.0074	< 0.0074	< 0.0074	< 0.0074	< 0.0074	< 0.0074	< 0.0056
FB-23	FB-23-1.0	1.0	10/1/2020	< 0.0077	< 0.0077	< 0.0077	< 0.0231	< 0.0077	< 0.0077	< 0.0077	< 0.0077	< 0.0077	< 0.0077	< 0.0077	< 0.0077	< 0.0077	< 0.0077	< 0.0077	< 0.0077	< 0.0077	< 0.0077	< 0.0077	< 0.0058
FB-24	FB-24-3.0	3.0	10/1/2020	0.16	0.078	0.12	0.358	0.13	< 0.038	0.12	0.088	0.40	0.26	0.78	0.37	0.14	0.14	0.15	0.048	0.14	< 0.038	0.075	**0.18**
	FB-24-6.0	6.0	10/1/2020	0.017	< 0.015	< 0.015	0.017	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.011
FB-25	FB-25-1.0	1.0	10/1/2020	< 0.0073	< 0.0073	< 0.0073	< 0.0219	< 0.0073	< 0.0073	< 0.0073	< 0.0073	0.0086	< 0.0073	< 0.0073	0.0084	< 0.0073	< 0.0073	< 0.0073	< 0.0073	< 0.0073	< 0.0073	< 0.0073	< 0.0055
	FB-25-3.0	3.0	10/1/2020	0.24	0.041	0.052	0.333	0.050	< 0.0075	0.037	0.031	0.20	0.047	0.21	0.17	0.053	0.069	0.059	0.023	0.069	< 0.0075	0.028	0.072
	FB-25-7.5	7.5	10/1/2020	< 0.0090	< 0.0090	< 0.0090	< 0.027	< 0.0090	< 0.0090	< 0.0090	< 0.0090	< 0.0090	< 0.0090	< 0.0090	< 0.0090	< 0.0090	< 0.0090	< 0.0090	< 0.0090	< 0.0090	< 0.0090	< 0.0090	< 0.0068
FB-27	FB-27-1.0	1.0	10/1/2020	< 0.0071	< 0.0071	< 0.0071	< 0.0213	< 0.0071	< 0.0071	0.0086	0.011	0.043	< 0.0071	0.042	0.038	0.016	0.017	0.019	0.0080	0.017	< 0.0071	0.010	0.022
	FB-27-5.0	5.0	10/1/2020	< 0.0074	< 0.0074	< 0.0074	< 0.0222	0.010	< 0.0074	0.021	0.012	0.079	< 0.0074	0.064	0.083	0.026	0.033	0.028	0.012	0.036	< 0.0074	0.013	0.035
FB-29	FB-29-14.0	14.0	1/8/2021	< 0.0074	< 0.0074	< 0.0074	< 0.0222	< 0.0074	< 0.0074	< 0.0074	< 0.0074	< 0.0074	< 0.0074	< 0.0074	< 0.0074	< 0.0074	< 0.0074	< 0.0074	< 0.0074	< 0.0074	< 0.0074	< 0.0074	< 0.0056
FB-30	FB-30-1.0	1.0	8/24/2021	< 0.0075	< 0.0075	< 0.0075	< 0.0225	< 0.0075	< 0.0075	< 0.0075	0.013	0.035	< 0.0075	0.028	0.036	0.018	0.016	0.021	< 0.0075	0.017	< 0.0075	0.013	0.024
	FB-30-3.0	3.0	8/24/2021	0.34	0.073	0.099	0.512	0.17	< 0.0090	0.064	0.057	0.21	0.21	0.37	0.21	0.094	0.089	0.11	0.033	0.094	0.011	0.057	**0.12**
	FB-30-6.5	6.5	8/24/2021	0.015	< 0.0089	< 0.0089	0.015	0.012	< 0.0089	< 0.0089	< 0.0089	0.029	0.019	0.066	0.022	< 0.0089	< 0.0089	< 0.0089	< 0.0089	< 0.0089	< 0.0089	< 0.0089	< 0.0067
FB-31	FB-31-1.0	1.0	8/24/2021	< 0.0077	< 0.0077	< 0.0077	< 0.0231	0.028	< 0.0077	0.12	0.072	0.34	0.040	0.36	0.33	0.14	0.14	0.15	0.053	0.14	0.017	0.076	**0.19**
	FB-31-3.0	3.0	8/24/2021	< 0.011	< 0.011	< 0.011	< 0.033	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.0083
	FB-31-6.0	6.0	8/24/2021	< 0.0078	< 0.0078	< 0.0078	< 0.0234	< 0.0078	< 0.0078	< 0.0078	< 0.0078	< 0.0078	< 0.0078	< 0.0078	< 0.0078	< 0.0078	< 0.0078	< 0.0078	< 0.0078	< 0.0078	< 0.0078	< 0.0078	< 0.0059
FB-32	FB-32-1.0	1.0	8/24/2021	< 0.0075	< 0.0075	< 0.0075	< 0.0225	< 0.0075	< 0.0075	< 0.0075	< 0.0075	0.013	< 0.0075	0.0076	0.012	< 0.0075	< 0.0075	0.0088	< 0.0075	< 0.0075	< 0.0075	< 0.0075	0.0062
	FB-32-3.0	3.0	8/24/2021	0.27	0.062	0.080	0.412	0.092	< 0.0085	0.063	0.046	0.26	0.098	0.38	0.21	0.074	0.075	0.081	0.031	0.084	0.0089	0.043	0.099
FB-33	FB-33-1.0	1.0	8/24/2021	0.0075	0.0099	0.0081	0.0255	0.036	< 0.0070	0.11	0.12	0.67	0.036	0.54	0.54	0.20	0.20	0.22	0.056	0.20	0.023	0.12	**0.26**
	FB-33-3.0	3.0	8/24/2021	0.10	0.051	0.087	0.238	0.12	< 0.0077	0.065	0.082	0.29	0.14	0.38	0.29	0.14	0.12	0.15	0.052	0.12	0.017	0.089	**0.18**
	FB-33-7.0	7.0	8/24/2021	< 0.0074	< 0.0074	< 0.0074	< 0.0222	< 0.0074	< 0.0074	< 0.0074	< 0.0074	< 0.0074	< 0.0074	< 0.0074	< 0.0074	< 0.0074	< 0.0074	< 0.0074	< 0.0074	< 0.0074	< 0.0074	< 0.0074	< 0.0056
FB-35	FB-35-1.0	1.0	8/24/2021	< 0.0069	< 0.0069	< 0.0069	< 0.0207	< 0.0069	< 0.0069	< 0.0069	< 0.035	0.018	< 0.0069	0.0082	0.019	< 0.035	0.011	< 0.035	< 0.035	0.015	< 0.035	< 0.035	0.026
FB-36	FB-36-2.0	2.0	8/24/2021	< 0.0073	< 0.0073	< 0.0073	< 0.0219	< 0.0073	< 0.0073	0.0079	0.015	0.054	< 0.0073	0.039	0.046	0.022	0.020	0.025	0.0091	0.023	< 0.0073	0.014	0.029
FB-37	FB-37-1.0	1.0	8/24/2021	< 0.0069	< 0.0069	< 0.0069	< 0.0207	< 0.0069	< 0.0069	< 0.0069	< 0.0069	0.0080	< 0.0069	< 0.0069	0.0091	0.0072	< 0.0069	0.0099	< 0.0069	0.0070	< 0.0069	< 0.0069	0.0096
	FB-37-5.0	5.0	8/24/2021	0.098	0.033	0.047	0.178	0.036	< 0.012	< 0.012	< 0.012	0.027	0.041	0.057	0.023	0.016	< 0.012	0.024	< 0.012	0.018	< 0.012	< 0.012	0.021
FB-39	FB-39-1.0	1.0	8/24/2021	< 0.0069	< 0.0069	< 0.0069	< 0.0207	0.0087	< 0.0069	0.045	0.052	0.14	0.0092	0.089	0.14	0.082	0.065	0.10	0.030	0.078	0.011	0.059	**0.11**
	FB-39-3.0	3.0	8/24/2021	< 0.0081	< 0.0081	< 0.0081	< 0.0243	< 0.0081	< 0.0081	< 0.0081	< 0.0081	< 0.0081	< 0.0081	0.0081	< 0.0081	< 0.0081	< 0.0081	< 0.0081	< 0.0081	< 0.0081	< 0.0081	< 0.0081	< 0.0061
	FB-39-6.0	6.0	8/24/2021	< 0.023	< 0.023	< 0.023	< 0.069	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.023	< 0.017
FB-40	FB-40-1.0	1.0	8/24/2021	< 0.0071	< 0.0071	< 0.0071	< 0.0213	< 0.0071	0.019	0.028	0.041	0.041	< 0.0071	0.015	0.049	0.060	0.049	0.13	0.027	0.083	0.011	0.049	0.087
	FB-40-3.0	3.0	8/24/2021	0.012	0.029	0.044	0.085	< 0.0077	0.014	0.030	0.033	0.083	0.022	0.095	0.097	0.033	0.035	0.050	0.0089	0.079	0.0080	0.020	0.046
	FB-40-8.0	8.0	8/24/2021	< 0.017	< 0.017	< 0.017	< 0.051	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017	< 0.013
FB-41	FB-41-1.0	1.0	8/24/2021	< 0.0070	< 0.0070	< 0.0070	< 0.021	< 0.0070	0.031	0.053	0.069	0.039	< 0.0070	0.011	0.045	0.062	0.032	0.12	0.021	0.055	0.014	0.080	0.089
	FB-41-3.0	3.0	8/24/2021	0.011	0.0081	0.010	0.0291	0.12	0.037	0.64	0.35	2.3	0.36	2.7	1.6	0.67	0.77	0.72	0.31	0.82	0.076	0.38	**0.9**
	FB-41-5.0	5.0	8/24/2021	< 0.0075	< 0.0075	< 0.0075	< 0.0225	< 0.0075	< 0.0075	< 0.0075	0.014	0.015	< 0.0075	0.017	0.022	0.013	0.012	0.017	< 0.0075	0.029	< 0.0075	0.0089	0.018
FB-42	FB-42-1.0	1.0	8/24/2021	< 0.0071	< 0.0071	< 0.0071	< 0.0213	< 0.0071	< 0.0071	< 0.0071	0.012	0.039	< 0.0071	0.031	0.038	0.019	0.018	0.023	< 0.0071	0.019	< 0.0071	0.012	0.025
	FB-42-3.0	3.0	8/24/2021	0.42	0.44	0.56	1.42	0.14	0.016	0.066	0.014	0.083	0.27	0.61	0.070	0.020	0.018	0.023	< 0.0078	0.022	< 0.0078	0.013	0.026
FB-44	FB-44-1.0	1.0	8/24/2021	< 0.0069	< 0.0069	< 0.0069	< 0.0207	< 0.0069	< 0.0069	< 0.0069	0.010	0.024	< 0.0069	0.019	0.024	0.015	0.012	0.019	< 0.0069	0.018	< 0.0069	0.010	0.02
	FB-44-3.0	3.0	8/24/2021	0.017	0.017	0.024	0.058	< 0.0082	< 0.0082	< 0.0082	< 0.0082	0.029	0.017	0.061	0.029	0.0083	0.0092	0.0097	< 0.0082	0.011	< 0.0082	< 0.0082	0.012
MTCA Method A Cleanup Level for Soil[6]							**5**	**4,800[7]**	**NE**	**24,000[7]**	**NE**	**3,200[7]**	**3,200[7]**	**NE**	**2,400[7]**								**0.1**

Table 2
Soil Analytical Results for PAHs
Thompson Field
Portion of King County Parcel No. 0825069104
Redmond, Washington
Farallon PN: 650-031

Sample Location	Sample Identification	Sample Depth (feet)[1]	Sample Date	Analytical Results (milligrams per kilogram)[2]																			
				Non-Carcinogenic PAHs												Carcinogenic PAHs							
				Naphthalene	1-Methylnaphthalene	2-Methylnaphthalene	Total Naphthalenes[3]	Acenaphthene	Acenaphthylene	Anthracene	Benzo(g,h,i)Perylene	Fluoranthene	Fluorene	Phenanthrene	Pyrene	Benzo(a)Pyrene	Benzo(a)Anthracene	Benzo(b)Fluoranthene	Benzo(j,k)Fluoranthene	Chrysene	Dibenzo(a,h)Anthracene	Indeno(1,2,3-cd)Pyrene	Total cPAHs TEC[4,5]
FB-46	FB-46-1.0	1.0	8/24/2021	< 0.0069	< 0.0069	< 0.0069	< 0.0207	< 0.0069	< 0.0069	< 0.0069	< 0.0069	< 0.0069	< 0.0069	< 0.0069	< 0.0069	< 0.0069	< 0.0069	< 0.0069	< 0.0069	< 0.0069	< 0.0069	< 0.0069	< 0.0052
	FB-46-3.0	3.0	8/24/2021	0.13	0.039	0.050	0.219	0.072	< 0.0076	0.085	0.066	0.29	0.083	0.35	0.29	0.12	0.12	0.12	0.037	0.14	0.014	0.062	**0.16**
	FB-46-7.5	7.5	8/24/2021	< 0.015	< 0.015	< 0.015	< 0.045	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.011
FB-47	FB-47-1.0	1.0	8/24/2021	0.0073	0.0072	0.0084	0.0229	0.027	0.012	0.10	0.19	1.0	0.029	0.43	1.1	0.40	0.37	0.59	0.13	0.52	0.051	0.22	**0.54**
	FB-47-3.0	3.0	8/24/2021	0.36	0.29	0.46	1.11	0.49	0.015	0.083	0.054	0.88	0.36	0.44	0.88	0.11	0.19	0.16	0.058	0.24	0.010	0.057	**0.16**
	FB-47-10.0	10.0	8/24/2021	< 0.0079	< 0.0079	0.0082	0.0082	0.0095	< 0.0079	< 0.0079	< 0.0079	0.0093	0.0079	0.0087	0.0082	< 0.0079	< 0.0079	< 0.0079	< 0.0079	< 0.0079	< 0.0079	< 0.0079	< 0.006
FB-48	FB-48-3.0	3.0	8/26/2021	0.025	0.012	0.015	0.052	0.034	0.095	0.17	0.16	0.54	0.041	0.69	0.78	0.31	0.33	0.30	0.074	0.33	0.034	0.15	**0.4**
FB-49	FB-49-1.0	1.0	8/26/2021	0.0089	0.0079	0.0083	0.0251	0.11	0.0098	0.56	0.48	2.2	0.15	1.8	2.0	0.92	0.93	0.93	0.37	1.0	0.12	0.52	**1.2**
	FB-49-3.0	3.0	8/26/2021	< 0.079	< 0.079	0.12	0.12	< 0.079	< 0.079	< 0.079	0.10	0.16	< 0.079	0.15	0.22	0.10	0.094	0.14	< 0.079	0.33	< 0.079	< 0.079	**0.14**
	FB-49-6.0	6.0	8/26/2021	0.028	< 0.016	< 0.016	0.028	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016	0.029	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016	< 0.012
FB-50	FB-50-3.0	3.0	8/26/2021	0.78	0.23	0.36	1.37	0.29	0.048	0.23	0.15	0.72	0.44	1.4	0.71	0.27	0.24	0.27	0.095	0.26	0.030	0.15	**0.35**
	FB-50-8.5	8.5	8/26/2021	< 0.032	< 0.032	< 0.032	< 0.096	< 0.032	< 0.032	< 0.032	< 0.032	< 0.032	< 0.032	< 0.032	< 0.032	< 0.032	< 0.032	< 0.032	< 0.032	< 0.032	< 0.032	< 0.032	< 0.024
FB-51	FB-51-3.0	3.0	8/26/2021	0.16	0.040	0.061	0.261	0.12	< 0.0083	0.10	0.029	0.33	0.29	0.82	0.24	0.043	0.064	0.061	0.019	0.072	< 0.0083	0.023	0.061
	FB-51-6.0	6.0	8/26/2021	< 0.0079	< 0.0079	< 0.0079	< 0.0237	< 0.0079	< 0.0079	< 0.0079	< 0.0079	< 0.0079	< 0.0079	< 0.0079	< 0.0079	< 0.0079	< 0.0079	< 0.0079	< 0.0079	< 0.0079	< 0.0079	< 0.0079	< 0.006
FB-53	FB-53-5.0	5.0	8/26/2021	0.013	< 0.0088	< 0.0088	0.013	0.019	< 0.0088	0.012	0.018	0.049	0.018	0.043	0.053	0.024	0.023	0.028	< 0.0088	0.034	< 0.0088	0.015	0.032
FMW-02	FMW-02-3.0	3.0	7/30/2020	1.1	0.36	0.54	2.0	0.70	0.012	0.28	0.11	0.94	1.1	2.1	0.78	0.20	0.26	0.23	0.081	0.25	0.025	0.11	**0.27**
	FMW-02-6.0	6.0	7/30/2020	2.5	1.2	1.7	**5.4**	3.3	0.055	1.7	0.64	5.5	4.9	13	4.2	1.2	1.5	1.3	0.48	1.5	0.15	0.63	**1.6**
	FMW-02-14.0	14.0	7/30/2020	0.86 H	0.44 H	0.56 H	1.86 H	1.2 H	0.031 H	0.53 H	0.16 H	2.6 H	1.5 H	4.6 H	2.1 H	0.30 H	0.57 H	0.38 H	0.11 H	0.48 H	0.036 H	0.19 H	**0.43**
FMW-03	FMW-03-5.0	5.0	7/31/2020	< 0.027	< 0.027	< 0.027	< 0.081	< 0.027	< 0.027	< 0.027	< 0.027	< 0.027	< 0.027	< 0.027	< 0.027	< 0.027	< 0.027	< 0.027	< 0.027	< 0.027	< 0.027	< 0.027	< 0.020
FMW-04	FMW-04-6.0	6.0	7/31/2020	0.051	0.059	0.092	0.20	< 0.0089	< 0.0089	< 0.0089	< 0.0089	< 0.0089	0.013	0.023	< 0.0089	< 0.0089	< 0.0089	< 0.0089	< 0.0089	< 0.0089	< 0.0089	< 0.0089	< 0.0067
FMW-05	FMW-05-1.0	1.0	10/1/2020	< 0.0081	< 0.0081	< 0.0081	< 0.0243	< 0.0081	< 0.0081	< 0.0081	< 0.0081	< 0.0081	< 0.0081	< 0.0081	< 0.0081	< 0.0081	< 0.0081	< 0.0081	< 0.0081	< 0.0081	< 0.0081	< 0.0081	< 0.0061
	FMW-05-6.0	6.0	10/1/2020	0.029	< 0.011	< 0.011	0.029	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	0.018	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011	< 0.0083
FMW-06	FMW-06-1.0	1.0	10/1/2020	< 0.015	< 0.015	< 0.015	< 0.045	< 0.015	0.017	0.026	0.039	0.030	< 0.015	< 0.015	0.029	0.043	0.034	0.064	0.017	0.075	< 0.015	0.044	0.06
	FMW-06-5.0	5.0	10/1/2020	< 0.022	< 0.022	< 0.022	< 0.066	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022	< 0.022	< 0.017
FMW-07	FMW-07-1.0	1.0	10/1/2020	< 0.0075	< 0.0075	< 0.0075	< 0.0225	< 0.0075	< 0.0075	< 0.0075	< 0.0075	0.021	< 0.0075	0.019	0.021	0.011	0.012	0.015	< 0.0075	0.012	< 0.0075	< 0.0075	0.015
	FMW-07-5.0	5.0	10/1/2020	< 0.031	< 0.031	< 0.031	< 0.093	< 0.031	< 0.031	< 0.031	< 0.031	< 0.031	< 0.031	< 0.031	< 0.031	< 0.031	< 0.031	< 0.031	< 0.031	< 0.031	< 0.031	< 0.031	< 0.023
MTCA Method A Cleanup Level for Soil[6]							**5**	**4,800[7]**	**NE**	**24,000[7]**	**NE**	**3,200[7]**	**3,200[7]**	**NE**	**2,400[7]**								**0.1**

Table 2
Soil Analytical Results for PAHs
Thompson Field
Portion of King County Parcel No. 0825069104
Redmond, Washington
Farallon PN: 650-031

				Analytical Results (milligrams per kilogram)[2]																			
				Non-Carcinogenic PAHs												Carcinogenic PAHs							
Sample Location	**Sample Identification**	**Sample Depth (feet)[1]**	**Sample Date**	**Naphthalene**	**1-Methylnaphthalene**	**2-Methylnaphthalene**	**Total Naphthalenes[3]**	**Acenaphthene**	**Acenaphthylene**	**Anthracene**	**Benzo(g,h,i)Perylene**	**Fluoranthene**	**Fluorene**	**Phenanthrene**	**Pyrene**	**Benzo(a)Pyrene**	**Benzo(a)Anthracene**	**Benzo(b)Fluoranthene**	**Benzo(j,k)Fluoranthene**	**Chrysene**	**Dibenzo(a,h)Anthracene**	**Indeno(1,2,3-cd)Pyrene**	**Total cPAHs TEC[4,5]**
Upland Sample Locations																							
FB-10	FB-10-3.0	3.0	9/30/2020	0.048	0.011	0.020	0.079	0.033	< 0.0083	0.016	< 0.0083	0.012	0.024	0.045	0.0083	< 0.0083	< 0.0083	< 0.0083	< 0.0083	< 0.0083	< 0.0083	< 0.0083	< 0.0063
FB-11	FB-11-5.0	5.0	9/30/2020	< 0.0080	< 0.0080	< 0.0080	< 0.024	< 0.0080	< 0.0080	< 0.0080	< 0.0080	< 0.0080	< 0.0080	< 0.0080	< 0.0080	< 0.0080	< 0.0080	< 0.0080	< 0.0080	< 0.0080	< 0.0080	< 0.0080	< 0.0060
FB-12	FB-12-5.0	5.0	9/30/2020	< 0.0080	< 0.0080	< 0.0080	< 0.024	< 0.0080	< 0.0080	< 0.0080	< 0.0080	< 0.0080	< 0.0080	< 0.0080	< 0.0080	< 0.0080	< 0.0080	< 0.0080	< 0.0080	< 0.0080	< 0.0080	< 0.0080	< 0.0060
FB-13	FB-13.1.0	1.0	9/30/2020	< 0.0082	< 0.0082	< 0.0082	< 0.0246	< 0.0082	< 0.0082	< 0.0082	< 0.0082	0.031	< 0.0082	< 0.0082	0.010	< 0.0082	< 0.0082	< 0.0082	< 0.0082	< 0.0082	< 0.0082	< 0.0082	< 0.0062
FB-14	FB-14-1.0	1.0	9/30/2020	< 0.0078	< 0.0078	< 0.0078	< 0.0234	< 0.0078	< 0.0078	< 0.0078	< 0.0078	< 0.0078	< 0.0078	< 0.0078	< 0.0078	< 0.0078	< 0.0078	< 0.0078	< 0.0078	< 0.0078	< 0.0078	< 0.0078	< 0.0059
MTCA Method A Cleanup Level for Soil[6]							**5**	**4,800[7]**	**NE**	**24,000[7]**	**NE**	**3,200[7]**	**3,200[7]**	**NE**	**2,400[7]**								**0.1**

NOTES:

Results in **bold** and highlighted **yellow** denote concentrations exceeding MTCA cleanup levels.
< denotes analyte not detected at or exceeding the reporting limit listed.
— denotes sample not analyzed.
[1]Depth in feet below ground surface.
[2]Analyzed by U.S. Environmental Protection Agency Method 8270E/SIM.
[3]Sum of naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene.
[4]Total cPAHs derived using the total toxicity equivalency method in Section 708(8) of Chapter 173-340 of the Washington Administrative Code.
[5]For concentrations reported at less than the laboratory reporting limit, half the reporting limit was used to calculate the TEC.
[6]Washington State Model Toxics Control Act Cleanup Regulation (MTCA) Method A Soil Cleanup Levels for Unrestricted Land Uses, Table 740-1 of Section 900 of Chapter 173-340 of the Washington Administrative Code, as revised 2013, unless otherwise noted.
[7]Washington State Department of Ecology Cleanup Levels and Risk Calculations, under MTCA Standard Method B Formula Values for Soil (Unrestricted Land Use) - Direct Contact (Ingestion Only) and Leaching Pathway, https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Contamination-clean-up-tools/CLARC

cPAHs = carcinogenic polycyclic aromatic hydrocarbons
H = sample analyzed outside of holding time
NE = not established
PAHs = polycyclic aromatic hydrocarbons
TEC = toxic equivalent concentration

APPENDIX A
TALASAEA CRITICAL AREAS REPORT

CLEANUP ACTION PLAN
Thompson Field
Portion of King County Parcel No. 0825069104
Redmond, Washington

Farallon PN: 650-031

CRITICAL AREAS REPORT
THOMPSON FIELD CONTAMINATION REMEDIATION AND WETLAND ENHANCEMENT PLAN

GUNSHY MANOR
KING COUNTY, WASHINGTON

Prepared For:

THE ESTATE OF BARBARA J. NELSON.
Redmond, Washington

Prepared By:

TALASAEA CONSULTANTS, INC.
Woodinville, Washington

1 July 2022

Critical Areas Report
Thompson Field Contamination Remediation
And Wetland Enhancement Plan

Gunshy Manor
King County, Washington

Prepared for:

The Estate of Barbara J. Nelson
16508 NE 79th Street
Redmond, Washington 98072

Prepared by:

Talasaea Consultants, Inc.
15020 Bear Creek Road NE
Woodinville, Washington 98077
425-861-7550

1 July 2022

Executive Summary

REPORT TYPE: Critical Areas Report

REPORT NAME: Gunshy Manor Thompson Field Contamination Remediation

REPORT PURPOSE: A remedial investigation conducted at Thompson Field indicated that contamination was present in fill soil at concentrations requiring cleanup per Washington Department of Ecology guidance. The fill soil contamination is localized to the southwest corner of Thompson Field and includes parts of Wetlands H and I. This report will describe the existing environmental conditions on Thompson Field, the proposed removal of contaminated fill soils, and provide a conceptual mitigation plan to enhance the impacted wetland area.

REPORT STAFF: Bill Shiels, Principal; David R. Teesdale, PWS, Senior Ecologist; Eva Parker, Landscape Architect.

CLIENT: The Estate of Barbara J. Nelson.

FIELD SURVEY: Initial field survey was performed on 18 May 2012. Additional fieldwork was performed on 14, 19, 21, 26, and 27 August and 15 October 2014; 15 February, 7, 8, 21, 22 April, and 16 May 2015; 2 and 12 February, 8 March, 8, 14 November, and 9 December 2016.

PROPERTY LOCATION: Thompson Field is an approximately 14-acre area located approximately in the middle of the larger Gunshy Manor property. It is located within Parcel 0825069012 (one of six parcels that comprise the Gunshy Manor property). It is bordered on all sides by gravel farm roads and fish-bearing farm ditches. The Public Land Survey System location is the NW ¼ of Section 8, T25N, R6E, Willamette Meridian.

DETERMINATION: Contaminated fill soils underly portions of two wetlands, Wetlands H and I, that were previously delineated for the Gunshy Manor Critical Areas Report (6 June 2017). It will be necessary to remove approximately 5,630 cubic yards of contaminated fill soil for disposal offsite at an approved dump site. The excavation is expected to be approximately seven feet deep at its deepest point.

Approximately 24,985 sf of wetland (Wetlands H and I combined) will be disturbed by both direct and indirect impacts during the excavation of the contaminated fill soils. Both wetlands are Category IV wetlands with a Habitat Score of 4, based on the 2014 revision of the Washington State Wetland Rating Manual for Western Washington. Enhancement ratios to mitigate impacts to Category IV wetlands in King County is 1.5:1 (§21A.24.340.B.2).

Enhancement will involve some minor grading along some adjacent edges in the excavated area, following contaminated fill soil removal, to modify the side slopes to create a more natural and diverse habitat for enhancement planting. In preparation for planting, a layer of soil with composted mulch will be spread across the entire disturbed/graded area. The area will then be hydroseeded with a variety of wetland and upland forbs and graminoids (grasses, sedges, rushes), and then the general area will be planted with a variety of native shrubs and trees. After the implementation of the mitigation plan, Wetlands H and I will be one wetland.

The total area of wetland enhancement is approximately 62,638 sf. The creation/restoration ratio will be approximately 2.3:1, which is greater than the suggested 1.5:1 ratio for Category IV wetlands as required in the King County Critical Areas code (§21A.24.340.B.2).

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Table of Contents

Executive Summary i
Table of Contents iii
List of Tables, Figures, Appendices iv

Chapter 1. Introduction 5
1.1 Report Purpose 5
1.2 Statement of Accuracy 5

Chapter 2. Property Overview 5
2.1 Property Location 5
2.2 Report's Intended Use 5
2.3 Existing Property Conditions 6

Chapter 3. Methodology 6
3.1 In-office Document Review 6
3.2 Field Investigations 6
3.2.1 Wetland Delineation Methodology 7
3.2.2 Hydric Soils 7
3.2.3 Plant Identification 8
3.2.4 Wetland Hydrology 8

Chapter 4. Results 8
4.1 Analysis of Existing Information 8
4.2 Analysis of Field Conditions 8
4.3 Wetlands 9
4.3.1 Wetland H 9
4.3.2 Wetland I 9
4.3.3 Buffer Impacts 10

Chapter 5. Thompson Field Remediation and Restoration Plan 10
5.1 Thompson Field Cleanup Action Plan 10
5.2 Draft Mitigation Goals, Objectives, and Performance Standards 11

Chapter 6. Construction Sequencing 12
6.1 Mitigation Construction Sequence 12
6.2 Post-Construction Approval 12
6.3 Post-Construction Assessment 12

Chapter 7. Monitoring Plan 12
7.1 Reports 12
7.2 Monitoring Methods 13
7.3 Photo Documentation 14
7.4 Wildlife 14

Chapter 8. Maintenance and Contingency 14

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Chapter 9. Summary 15

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List of Figures

Figure 1 – Vicinity Map
Figure 2 – Thompson Field Existing Conditions Map
Figure 3 – Location of Contaminated Soil in Thompson Field
Figure 4 – Conceptual Grading Plan
Figure 5 – Conceptual Planting Plan
Figure 6 – Conceptual Section and Candidate Plant List

List of Appendices

Appendix A: Gunshy Manor Critical Areas Report and Mitigation Plan (6 January 2017)
Appendix B: Wetland Datasheets
Appendix C: Wetland Rating Sheets

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Chapter 1. INTRODUCTION

1.1 Report Purpose

This report is the result of a critical areas study of Thompson Field, which is a part of the Gunshy Manor property (Thompson Field will be referred to as "Site" hereinafter). The Gunshy Manor Property is located southeast of the intersection of NE Union Hill Road and 196th Avenue NE in King County, Washington (**Figure 1**). The Site is located in the eastern portion of Parcel 0825069012. The purpose of this report is to describe critical areas located on and adjacent to the Thompson Field area, discuss the area of contaminated fill soils and the wetlands impacted, and provide a conceptual enhancement plan.

The report has been prepared to comply with the requirements of King County Code Chapter 21A.24 (Critical Areas). Specifically, this report provides the following information:

- General property description;
- Results of critical areas background reviews, field investigations, and reports prepared by others;
- Revised wetland ratings; and
- Regulatory review.

1.2 Statement of Accuracy

The critical area studies and regulatory reviews were conducted by trained professionals of Talasaea Consultants, Inc., in adherence to the protocols, guidelines, and generally accepted industry standards available at the time work was performed. The conclusions in this report are based on the results of analyses performed by Talasaea Consultants and represent our best professional judgment. To that extent, and within the limitations of project scope and budget, we believe the information provided herein is accurate and true to the best of our knowledge. Talasaea Consultants does not warrant any assumptions or conclusions not expressly made in this report, or based on information or analyses other than what is included herein.

Chapter 2. PROPERTY OVERVIEW

2.1 Property Location

The Site is an approximately 14-acre area located approximately in the middle of the larger Gunshy Manor property. The Site is located within Parcel 0825069012 (one of six parcels that comprise the Gunshy Manor property), which is the westernmost parcel of Gunshy Manor. It is bordered on all sides by gravel farm roads and fish-bearing farm ditches. The Public Land Survey System location is the NW ¼ of Section 8, T25N, R6E, Willamette Meridian.

2.2 Report's Intended Use

This report is intended to accompany the Thompson Field Remediation and Restoration Plan to be used for a CAP submittal to Ecology and a wetland enhancement plan submittal to King County. This report will also be submitted with a JARPA to the Corps

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of Engineers and Department of Ecology for Section 404 and 401 permits. This report also serves as required information for an application for a King County Grading Restoration Permit for contaminated soil removal and wetland enhancement per King County Code Enforcement File # ENFR14-0512 and an application for a Critical Areas Designation for review by the King County Department of Permitting and Environmental Review (DLS).

2.3 Existing Property Conditions

Parcel 0825069012, which includes Thompson Field, is currently undeveloped and used for hay production.

Chapter 3. METHODOLOGY

3.1 In-office Document Review

The critical areas analysis of the Property involved a two-part effort. The first part consisted of a preliminary assessment of the Property and the immediate surrounding area using published environmental information. This information included:

1. Wetland and soils information from resource agencies;
2. Previous critical areas reports prepared by Talasaea Consultants; and
3. Relevant studies completed or ongoing in the vicinity of the Property supplied to us by the Client (including historical uses of the Property).

The second part consisted of property investigations where direct observations of existing environmental conditions were made. Plant communities, soils, hydrology, and stream and wetland conditions were observed. This information was used to help characterize onsite wetlands and define the limits of the Ordinary High Water Mark (OHWM) of streams and fish-bearing farm ditches for regulatory purposes (see **Section 3.2 – Field Investigation**, below).

3.2 Field Investigations

The critical areas on Thompson Field were investigated by Talasaea Consultants several times between 18 May 2012 and 10 May 2017. Existing conditions of Thompson Field were recorded, including relevant information concerning onsite and offsite wetlands and streams.

Our previous investigations included an evaluation of patterns of vegetation, soil, and hydrology along the interface of wetland and upland areas within Thompson Field. **Appendix B** contains USACE Wetland Determination data forms completed by Talasaea for representative locations in both upland and wetland locations for the impacted wetlands (Wetlands H and I) on Thompson Field (**Figure 2**). These data forms document the vegetation, soils, and hydrology information that aided in the wetland boundary determination. While datasheets are typically paired with a wetland and upland point to reflect the conditions of the wetland boundary at that point, not all of the added datasheets are paired.

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3.2.1 Wetland Delineation Methodology

Wetlands within Thompson Field were delineated using the methodologies described in the U.S. Army Corps of Engineers *Regional Supplement to the Corps of Engineers Wetland Delineation and Identification Manual: Western Mountains, Valleys, and Coast Region* (U.S. Army Corps of Engineers, 2010). The methodology provided in Chapter 5 of the Corps' Regional Supplement is appropriate for use on Thompson Field for situations where one or more wetland indicators have been modified, or is missing, due to natural or human-induced impacts. This methodology was selected because (1) much of the Property has been actively farmed for the past 58 years and, (2) the fields have been and are continuing to be used for grazing of cattle and horses and hay production. As a result of such farming activities, it is very likely that (a) wetland indicators have been altered to some degree, and (b) onsite vegetation has been significantly altered (especially due to active vegetation management in support of grazing and production of high-quality grasses for hay). The disturbances resulting from the farming activities present on-site are a relatively permanent condition that reflects the normal conditions for the Site. This is especially true given the long timeframe that the Site has been undergoing these disturbances.

However, despite the presence of normal conditions on the Site, vegetation has been significantly disturbed as the farm fields in question have been regularly maintained, including overseeding with specific grass species and mowing. To determine the presence of wetland vegetation on Gunshy Manor, Talasaea referenced the methodology for Managed Plant Communities where analysis of hydrophytic vegetation was not reliable or possible (ref. Appendix C – Problematic Hydrophytic Vegetation in the Corps Regional Supplement). In areas where the original unmanaged vegetation pattern could not be determined through comparison with unmanaged reference sites, Talasaea utilized indicators of hydric soils and wetland hydrology to infer the likelihood that, but for the current land management activities, hydrophytic vegetation would be present.

3.2.2 Hydric Soils

Fill material was added to the Thompson Hay Field more than 30 years ago, which is still evident in the soil test pits today. Thompson Field, where wetlands have been delineated, is currently used for hay production. Soils within Thompson Field have not been subjected to plowing or tilling with any regularity, and thus hydric soil indicators are expected to persist in the soils. Soils were not considered significantly disturbed except where the sample point locations overlapped the areas with previously added fill material, as noted above. Soil management practices appear not to have significantly disturbed the presence of positive hydric soil characteristics, despite the soils themselves having been disturbed over time.

Soils on the Site were considered hydric if one or more of the hydric soil indicators listed in the Corps Regional Supplement are present. Indicators include the presence of organic soils, reduced, depleted, or gleyed soils, or redoximorphic features in association with reduced soils. Soils were also considered hydric if a combination of hydric soil indicators could be observed. If the only parameter not meeting the indicator was the thickness of the layer containing the redox features, these instances were also

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considered a hydric soil. Soils that lacked redoximorphic features, soils that had redoximorphic features present below the depth threshold for any particular hydric soil indicator, or soils that are clearly relict features (features lacking a diffuse redoximorphic boundary), were not considered to meet the criteria as a hydric soil.

3.2.3 Plant Identification

Plant species were identified according to the taxonomy of Hitchcock and Cronquist (Hitchcock and Cronquist 2018). Taxonomic names were updated and plant wetland status was assigned according to North American Digital Flora: National Wetland Plant List, Version 2.4.0 (Lichvar 2020). Wetland classes were determined with the U.S. Fish and Wildlife Service's system of wetland classification (Cowardin *et al*. 1979). Vegetation was considered hydrophytic if greater than 50% of the dominant plant species had a wetland indicator status of facultative or wetter (i.e., facultative, facultative wetland, or obligate wetland).

3.2.4 Wetland Hydrology

Wetland hydrology was determined based on the presence of hydrologic indicators listed in the above-mentioned Corps' Regional Supplement. These indicators are separated into Primary Indicators and Secondary Indicators. To confirm the presence of wetland hydrology, one Primary Indicator or two Secondary Indicators must be demonstrated to exist. Indicators of wetland hydrology may include, but are not necessarily limited to: drainage patterns, drift lines, sediment deposition, watermarks, stream gauge data and flood predictions, historic records, visual observation of saturated soils, and visual observation of inundation.

Chapter 4. RESULTS

4.1 Analysis of Existing Information

Please see Talasaea's Critical Areas Report with Mitigation Plan (6 January 2017) in **Appendix A**, which was prepared for the entire Gunshy Manor property, including Thompson Field.

4.2 Analysis of Field Conditions

Our 2017 report identified four features (three wetlands and one aquatic area) on the Site as shown in **Figure 2**. Our analysis of field conditions is limited to two of the Thompson Field wetlands (Wetlands H and I) since these two wetlands will be directly impacted by the soil remediation and wetland enhancement work.

Wetlands were delineated using the methodology outlined in Chapter 5 (Difficult Wetland Situations in the Western Mountains, Valleys, and Coast Region) of the Corps Regional Supplement (2010). This methodology involves a more in-depth analysis of existing conditions, patterns of vegetation, soil conditions, and hydrology, along with comparisons of conditions on nearby undisturbed sites. For the most part, wetlands were determined through demonstration of the presence of wetland hydrology (direct observation of hydrology during the early part of the growing season and shallow groundwater monitoring) and the predominance of hydrophytic vegetation. An extensive hydric soil evaluation was conducted in November 2016 to supplement the

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previously identified wetland boundaries with a substantial number of wetland datasheets completed to fully document the wetland boundaries.

The soil in Thompson Field has been disturbed to some extent due to the importation of fill material and land management activities typically used on farmed land. The analysis of field hydric soil indicators involved a close examination of any redoximorphic features to determine whether these features had diffuse or sharp boundaries. Redoximorphic features with sharp boundaries indicate that the test plot is located in an area without an active water table within the upper part of the soil's root zone. The datasheets prepared in November 2016 contain detailed notes on the soils and why each point was determined the way it was. It is important to note that several datasheets within existing wetlands (particularly within Thompson Field) lacked a hydric soil indicator. However, the intent of the November 2016 evaluation was to document the wetland boundaries as they existed then, and expand the boundaries as needed, not to adjust boundaries smaller.

4.3 Wetlands

4.3.1 Wetland H

Wetland H is a palustrine emergent wetland located on the north side of the Thompson Hay Field (**Figure 3**). The size of this wetland is approximately 73,436 sf (1.66 ac). Wetland H is currently managed for hay production and is regularly mowed as a part of ongoing farming activities. Vegetation includes various pasture grasses, meadow foxtail (*Alopecurus pratensis*), and soft rush. Upland vegetation generally lacked soft rush and meadow foxtail. One very minor adjustment was made during the November 2016 property evaluation to this wetland boundary in the northeast corner where several flags were deleted to create a slightly larger wetland near where Wetland K is located. Additional data were collected in and around Wetland H.

Within the Thompson Hay Field (in which Wetland H exists), soil color and texture were consistent between Wetlands H, I, and K, as well as the upland areas of Thompson Hay Field. Soil color within the wetland was generally gray with brownish-yellow redoximorphic features.

Hydrology for Wetland H is supported by a shallow seasonal groundwater table. Water in Wetland H generally flows unimpeded to Farm Ditch D2 via an existing network of drain tiles and field drains.

We rated Wetland H using the Washington State Wetland Rating System for Western Washington (2014) (**Appendix C**). Wetland H scored 5 points for Water Quality Functions, 5 points for Hydrologic Functions, and 4 Points for Habitat Functions. The Total Score for Functions is 14, which satisfies the criteria for characterization as a King County Category IV wetland. Category IV wetlands have a 40-foot standard buffer when located outside of a UGA.

4.3.2 Wetland I

Wetland I is a small depressional wetland within Thompson Hay Field (**Figure 2**). It is located southwest of Wetland H. The size of Wetland I is approximately 18,712 sf

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(0.4 ac). Vegetation and soil conditions within Wetland I are similar to Wetland H. However, Wetland I occurs in a slight topographic low area. Therefore, it was rated as a depressional wetland with no visible aboveground outlet. No changes were made to this wetland boundary during the November 2016 Property evaluation, though additional data were collected in and around Wetland I.

Hydrology for Wetland I is supported by a shallow seasonal groundwater table. Water in Wetland I generally flows unimpeded to Farm Ditch D2 via an existing network of drain tiles and field drains.

We rated Wetland I using the Washington State Wetland Rating System for Western Washington (2014) (**Appendix C**). Wetland I scored 5 points for Water Quality Functions, 6 points for Hydrologic Functions, and 4 points for Habitat Functions. The Total Score for Functions is 15, which satisfies the criteria for characterization as a King County Category IV wetland. Category IV wetlands have a 40-foot standard buffer when located outside of a UGA.

4.3.3 Buffer Impacts

The area of remedial soil excavation (approximately 86,288 sf) is mostly within the buffers for Wetlands B, E, and H, and Farm Ditch 1[2]. The total area of excavation is approximately 86,288 sf. Approximately 24,985 sf will impact the combined buffer areas for Farm Ditch 1 and Wetlands B, E, and H. Buffers impacted within King County are mitigated at a ratio of 1:1. Therefore, the area of buffer mitigation required by King County is approximately 24,985 sf. Impacted buffers will be restored by planting a variety of native shrubs and trees.

Chapter 5. THOMPSON FIELD REMEDIATION AND RESTORATION PLAN

5.1 Thompson Field Cleanup Action Plan

The Thompson Field Cleanup Action Plan will be prepared and submitted by Farallon Consulting. The following is a summary of the cleanup and wetland enhancement plan.

The contaminated fill soil underlies most of Wetland I and a small portion of Wetland H (**Figure 3**). Remediation will involve removing approximately 5,630 cu yd of soil. The soil removed will be transported offsite to a receiving facility approved for handling contaminated soils.

After the removal of the contaminated fill soil, and if required to create a more natural slope, the resulting pit may have some minor grading along some of the adjacent edges of the excavated area to modify the side slopes to create a more natural and diverse habitat for enhancement planting (**Figure 5**). The recontoured pit will now be a depressional wetland that will be approximately seven feet deep at its deepest point. The total area of the new wetland (Wetland H) will be approximately 62,637 sf in size. After recontouring Wetland H, a layer of soil with composted mulch will be spread on the sides of the pit and the wetland will be hydroseeded with a variety of wetland and

[2] Wetland B has a 225-ft standard buffer. Farm Ditch 1 has a 165-ft standard buffer. Wetland E has a 60-ft standard buffer. Wetlands H and I have 40-ft standard buffers.

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upland forbs and graminoids (grasses, sedges, and rushes). The general area will then be selectively planted with a variety of hydrophytic and upland forbs and graminoids (grasses, sedges, and rushes), and then planting a variety of native shrubs and tees at select locations in and adjacent to the disturbed areas as enhancement. Large woody debris (stumps, snags, and down logs), will be added in selected locations; bat roosting and bird nesting boxes will be installed on the snags. Following the implementation of the mitigation plan, Wetland H and Wetland I will be one wetland.

5.2 Mitigation Goals, Objectives, and Performance Standards

The following performance standards for species shall apply:

- **Species diversity.** At least five (5) trees (three conifer and two small deciduous species) and nine (9) shrubs will be present during the monitoring period.
- **Plant survival.** At least 70% of this vegetation shall survive at the conclusion of the second vegetation monitoring event.
- **Plant survival**. Survival will be measured to assess the health of the mitigation area and will also be used to monitor species diversity. Plant survival will be no less than 70 percent on any subsequent year of monitoring.
- **Aerial plant coverage**. Plant cover is one way to measure the success of a newly planted area through natural regeneration and repopulation of a planted area. Aerial cover will be calculated at each permanent sampling transect via the point-intercept method and averaged across all transects to understand general site conditions. Total aerial coverage by woody plants will be 10% by the end of Year 1, 20% by the end of Year 2, 30% by the end of Year 3, and 50% by the end of Year 5.

Chapter 6. CONSTRUCTION SEQUENCING

6.1 Mitigation Construction Sequence

The following provides the general sequence of activities anticipated to be necessary to complete this mitigation project. Some of these activities may be conducted concurrently as the project progresses.

1. Conduct a site meeting between the Contractor, Talasaea Consultants, and the Owner's Representative to review the project plans, work areas, staging/stockpile areas, and material disposal areas.
2. Survey clearing/grading limits.
3. Install silt fencing and any other erosion and sedimentation control BMPs necessary for work in the project areas per civil plans.
4. Complete remedial excavation of contaminated soils.
5. Remove all trash and debris and grub out invasive species in buffer areas
6. Decompact soils and place topsoil or soil amendments as required.
7. Install habitat features (snags, down logs, and stumps).
8. Mulch all cleared/grubbed buffer areas.
9. Complete site cleanup and install plant material as indicated on the planting plan.

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6.2 Post-Construction Approval

Following mitigation construction completion Talasaea Consultants shall notify King County in writing to request a final site inspection for final construction approval. Once the County has approved the mitigation construction, the monitoring period shall commence.

6.3 Post-Construction Assessment

Once construction is approved by King County, a qualified wetland ecologist or biologist from Talasaea Consultants shall conduct a post-construction assessment. The purpose of this assessment will be to establish baseline conditions at Year 0 of the required monitoring period. A Baseline Assessment report including "as-built" drawings will be submitted to the County. The as-built plans will identify and describe any changes in planting or other features with the original approved plan.

Chapter 7. MONITORING PLAN

Performance monitoring of the mitigation areas will be conducted for a period of five years consistent with King County code §21A.24. Monitoring events will be conducted according to the schedule presented in **Table 1**. All monitoring will be performed by a qualified biologist or ecologist.

7.1 Reports

The reports will include: 1) Project Overview, 2) Mitigation Requirements, 3) Summary Data, 4) Maps and Plans, and 5) Conclusions. If the performance criteria are met, monitoring for the County will cease at the end of year five, unless objectives are met at an earlier date and the County accepts the mitigation project as successfully completed.

Table 1. Projected Schedule for Performance Monitoring and Maintenance Events.

Year	Date	Maintenance Review	Performance Monitoring	Report Due to Agencies
Completion Report (includes As-built drawings and baseline assessment data)	Within 14 days of completing activity			X
Year 1 (includes As-built drawings and baseline assessment data)	Fall	X	X	X
Year 2	Spring	X	X	
	Fall	X	X	X
Year 3	Spring	X	X	
	Fall	X	X	
Year 4	Spring	X		
	Fall	X	X	X
Year 5	Spring	X		
	Fall	X	X	X*

*Obtain final approval to facilitate bond release from King County (presumes performance criteria are met).

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7.2 Monitoring Methods

Vegetation monitoring methods may include counts; photo-points; random sampling; sampling plots, quadrats, or transects; stem density; visual inspection; and/or other methods deemed appropriate by the permitting agencies and the biologist/ecologist. Vegetation monitoring components shall include general appearance, health, mortality, colonization rates, percent cover, percent survival, volunteer plant species, and invasive weed cover.

Permanent vegetation sampling plots, quadrats, and/or transects will be established at selected locations to adequately sample and represent all the plant communities within the mitigation project areas. The number, exact size, and location of transects, sampling plots, and quadrats will be determined at the time of the baseline assessment.

Percent areal cover of woody vegetation (forested and/or scrub-shrub plant communities) will be evaluated using a point-intercept sampling methodology. Using this methodology, a tape will be extended between two permanent markers at each end of an established transect. Trees and shrubs intercepted by the tape will be identified, and the intercept distance recorded. Percent cover by species will then be calculated by adding the intercept distances and expressing them as a total proportion of the tape length.

The established vegetation sampling locations will be monitored and compared to the baseline data during each performance monitoring event to aid in determining the success of plant establishment. The percent survival of shrubs and trees will be evaluated in a 10-foot-wide strip along each established transect. The species and location of all shrubs and trees within this area will be recorded at the time of the baseline assessment and will be evaluated during each monitoring event to determine percent survival.

7.3 Photo Documentation

Locations will be established within the mitigation areas from which panoramic photographs will be taken throughout the monitoring period. These photographs will document the general appearance and relative changes within the plant communities. A review of the photos over time will provide a semi-quantitative representation of the success of the planting plan. Vegetation sampling plots and photo-point locations will be shown on a map and submitted with the baseline assessment report and yearly performance monitoring reports.

7.4 Wildlife

Birds, mammals, reptiles, amphibians, and invertebrates observed in the mitigation areas (either by direct or indirect means) will be identified and recorded during scheduled monitoring events, and at any other times observations are made. Direct observations include actual sightings, while indirect observations include tracks, scat, nests, songs, or other indicative signs. The kinds and locations of the habitat with the greatest use by each species will be noted, as will any breeding or nesting activities.

Chapter 8. MAINTENANCE AND CONTINGENCY

Regular maintenance reviews will be performed according to the schedule presented in **Table 4** to address any conditions that could jeopardize the success of the mitigation

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project. Following maintenance reviews by the biologist or ecologist, required maintenance on the Site will be implemented within ten (10) business days of submission of a maintenance memo to the maintenance contractor and permittee.

Established performance standards for the project will be compared to the yearly monitoring results to judge the success of the mitigation. If during the monitoring period, there appears to be a significant problem with achieving the performance standards, the permittee shall work with the permitting agencies to develop a Contingency Plan to get the project back into compliance with the performance standards. Contingency plans can include, but are not limited to, the following actions: additional plant installation, erosion control, modifications to hydrology, and plant substitutions of type, size, quantity, and/or location. If required, a Contingency Plan shall be submitted by December 31st of any year when deficiencies are discovered.

The following list includes examples of maintenance (M) and contingency (C) actions that may be implemented during the monitoring period. This list is not intended to be exhaustive, and other actions may be implemented as deemed necessary.

- During year one, replace all dead woody plant material (M).
- Water all plantings at a rate of 1” of water every week between June 15 – October 15 during the first two years after installation, and for the first two years after any replacement plantings (C & M).
- Replace dead plants with the same species or a substitute species that meet the goals and objectives of the mitigation plan, subject to Talasaea and agency approval (C).
- Re-plant area after the reason for failure has been identified (e.g., moisture regime, poor plant stock, disease, shade/sun conditions, wildlife damage, etc.) (C).
- After consulting with County staff, minor excavations, if deemed to be more beneficial to the existing conditions than currently exists, will be made to correct surface drainage patterns (C).
- Remove/control weedy or non-native invasive plants (e.g., Scot's broom, reed canarygrass, Himalayan blackberry, purple loosestrife, Japanese knotweed, etc.) by manual or chemical means approved by permitting agencies. The use of herbicides or pesticides within the mitigation area would only be implemented if other measures failed or were considered unlikely to be successful and would require prior agency approval. All non-native vegetation must be removed and disposed of off-site. (C & M).
- Weed all trees and shrubs to the dripline and provide 3-inch deep mulch rings 24 inches in diameter for shrubs and 36 inches in diameter for trees (M).
- Remove trash and other debris from the mitigation areas twice a year (M).
- Selectively prune woody plants under the direction of Talasaea Consultants to meet the mitigation plan's goal and objectives (e.g., thinning and removal of dead or diseased portions of trees/shrubs) (M).
- Repair or replace damaged structures including weirs, signs, fences, or bird boxes (M).

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Chapter 9. SUMMARY

Three wetlands, one aquatic area, and two fish-bearing farm ditches were identified and delineated on the Site. The wetlands were delineated using the atypical methodology for difficult wetland situations as described in Chapter 5 of the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (2010), and rated using the *Washington State Wetlands Rating System for Western Washington* (rev. 2014). The aquatic areas and farm ditches were determined to be either fish-bearing or have potential fish habitat, as defined under WAC 222-16-031 (Interim Water Typing System). Buffers to wetlands and aquatic areas were determined using King County Code 21A.24.325 and 21A.24.358 for critical areas occurring outside of a UGA.

Contaminants were found in the southwestern corner of Thompson Field at levels requiring removal. The area of excavation will impact approximately 24,985 sf of Category IV wetlands (a portion of Wetland H and most of Wetland I). Mitigation for the wetland impacts, once contaminated soils have been removed, will involve applying a layer of soil and composted mulch over the exposed soil areas, hydro-seeding the entire area with a variety of hydrophytic and upland forbs and graminoids (grasses, sedges, rushes), and then planting a variety of native shrubs and trees at select locations in and adjacent to the disturbed areas as enhancement. Large woody debris (stumps, snags, and down logs) will be added in selected locations, and bat roosting and bird nesting boxes will be installed on the snags.

Following the implementation of this mitigation plan, Wetlands H and I will be one unit. The enhanced wetland area will be approximately 62,638 sf in size, more than twice the replacement-to-loss ratio required by King County for Category IV wetlands as stated in the King County Critical Areas Code (§21A.24.340C).

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Figures

Figure 1 – Vicinity Map
Figure 2 – Thompson Field Existing Conditions Map
Figure 3 – Location of Contaminated Soil in Thompson Field
Figure 4 – Conceptual Grading Plan
Figure 5 – Conceptual Planting Plan
Figure 6 – Conceptual Section and Candidate Plant List

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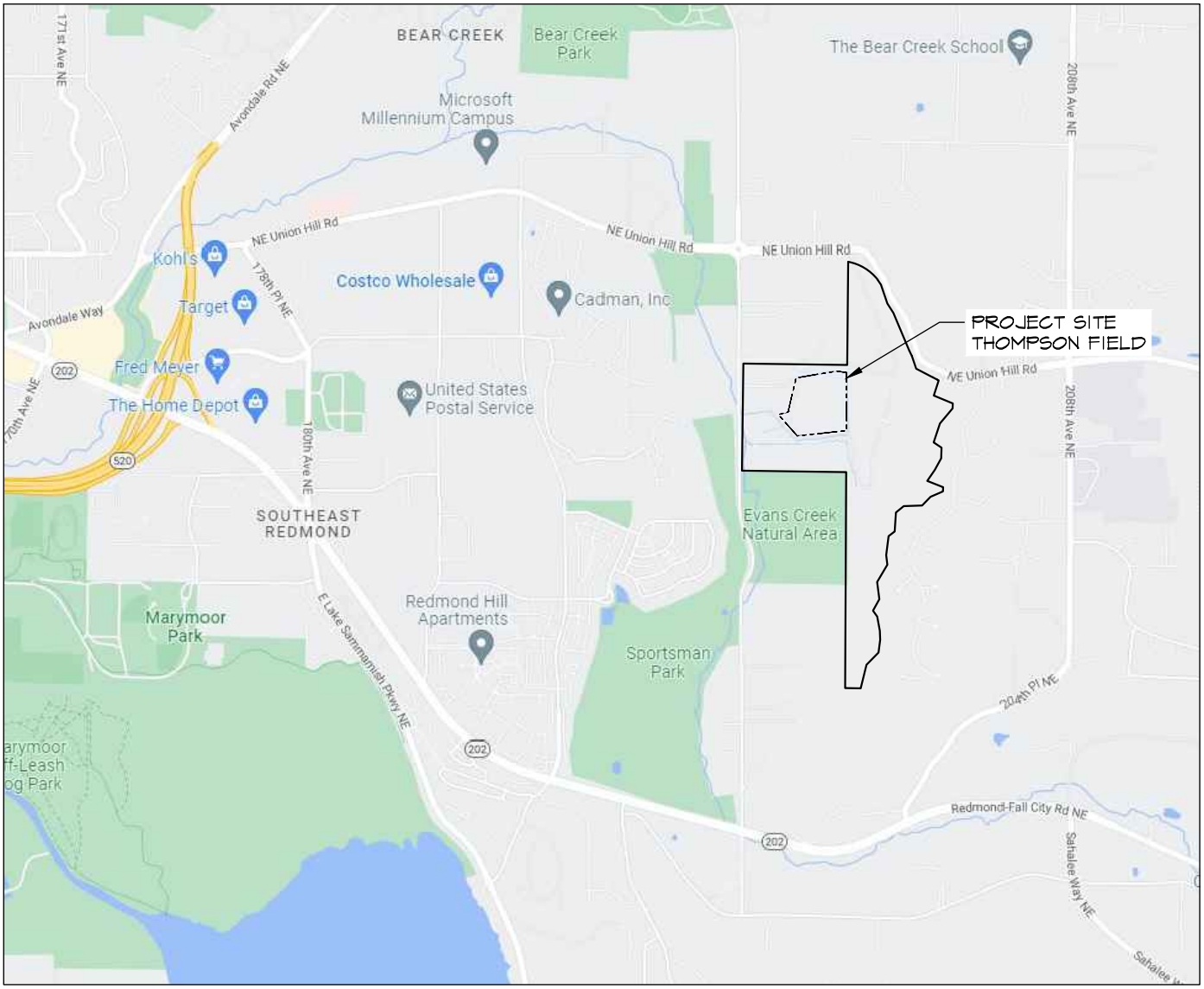

SOURCE: GOOGLE MAPS; WWW.GOOGLE.COM/MAPS (ACCESSED 6-02-2022)

DRIVING DIRECTIONS:

1) FROM SEATTLE TAKE I-90 TO BELLEVUE
2) TAKE EXIT 11B FROM I-90E
3) TAKE WA-520E TO REDMOND
4) AT THE NEXT TRAFFIC SIGNAL, TURN RIGHT ONTO NE UNION HILL ROAD
5) AT THE TRAFFIC CIRCLE, CONTINUE ONTO ONTO NE UNION HILL ROAD
6) ARRIVE AT DESTINATION ON THE RIGHT:
   20005 NE UNION HILL RD
   REDMOND, WA 98053

NOTE: EVANS CREEK LOCATION DOES NOT REFLECT FIELD CONDITIONS

NORTH

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FIGURE #1

VICINITY MAP & DRIVING DIRECTIONS
GUNSHY-THOMPSON FIELD
REDMOND, WASHINGTON

DESIGN	DRAWN	PROJECT
	KF	1147
SCALE NTS		
DATE 6-28-2022		1
REVISED		

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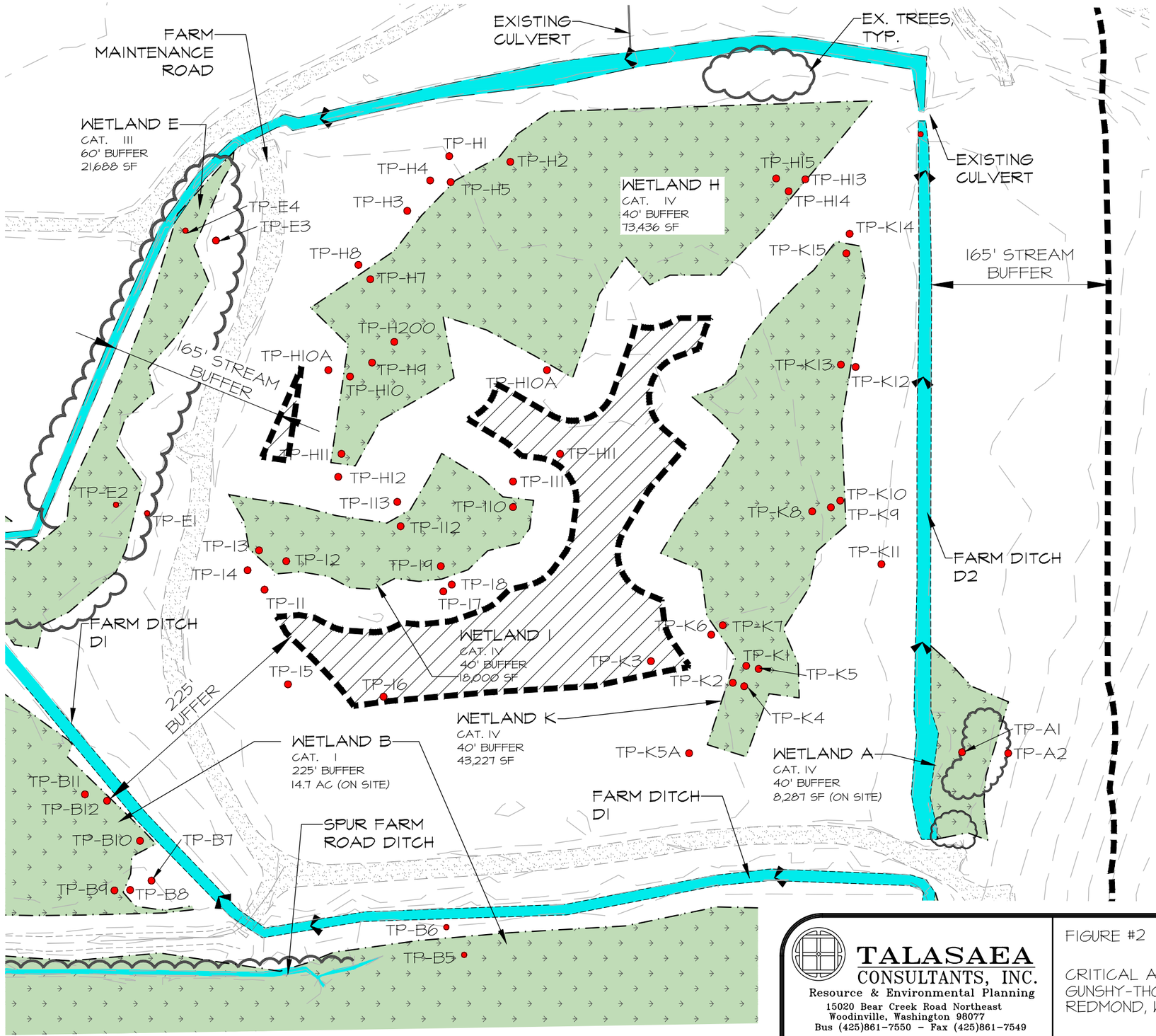

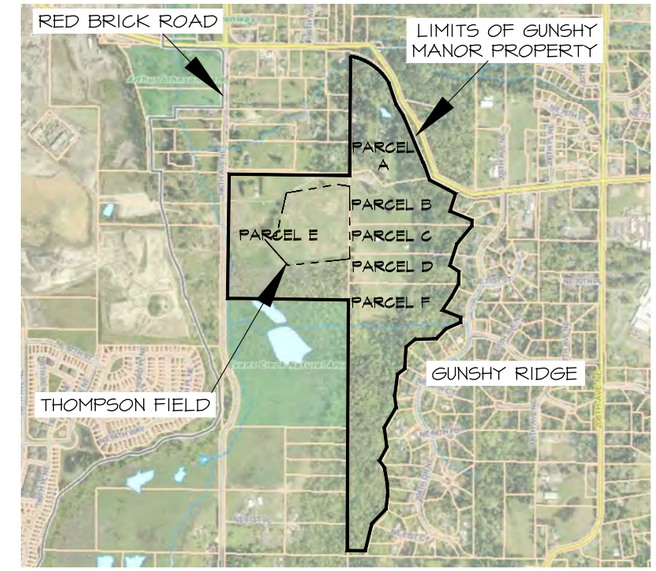

KEY PLAN

PLAN LEGEND

- EXISTING WETLAND
- ORDINARY HIGH WATER MARK (OHWM)
- EXISTING 2 FT CONTOUR
- AREA OUTSIDE OF STREAM AND WETLAND BUFFERS
- TP-# SOIL TEST PLOT LOCATION
- EXISTING TREES

GRAPHIC SCALE
(IN FEET)
0 50 100 200
SCALE: 1"=100'

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FIGURE #2

CRITICAL AREAS MAP IN THOMPSON FIELD
GUNSHY-THOMPSON FIELD
REDMOND, WASHINGTON

DESIGN	DRAWN	PROJECT
	KF, TH	1147
SCALE NTS		
DATE 6-28-2022		2
REVISED		

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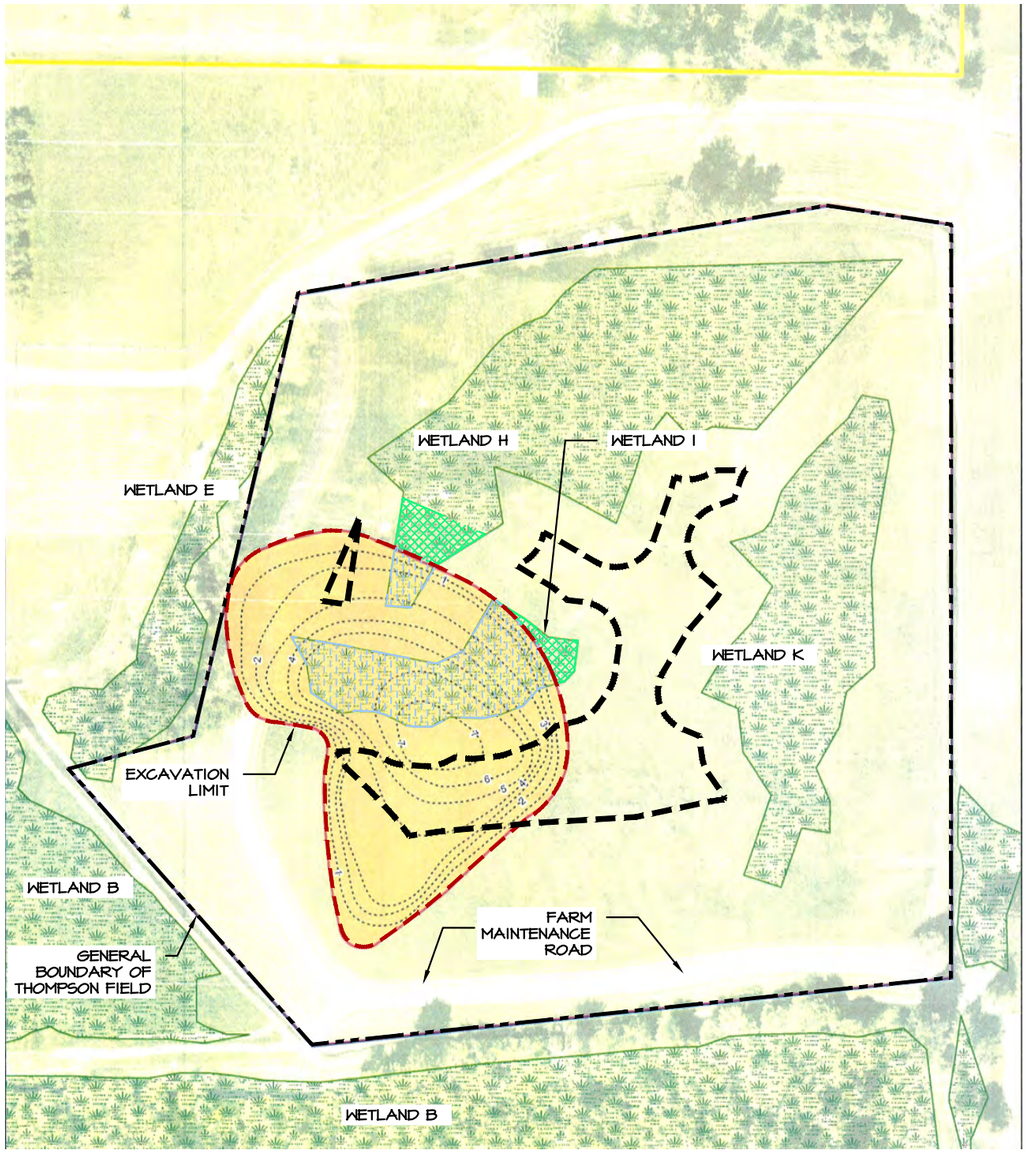

GRAPHIC SCALE
(IN FEET)

0 75 150 300

SCALE: 1"=150'

NORTH

PLAN LEGEND

- LIMIT OF CONTAMINATED SOIL EXCAVATION: 92,858 SF
- GENERAL BOUNDARY OF THOMPSON FIELD
- AREA OUTSIDE OF WETLAND AND STREAM BUFFERS
- INDIRECT WETLAND IMPACT ESTIMATE 5,040 SF
- DIRECT WETLAND IMPACT ESTIMATE 19,945 SF

TOTAL WETLAND IMPACTS: 24,985 SF

EXISTING CONDITIONS PLAN

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FIGURE #3
LOCATION OF CONTAMINATED SOIL
IN THOMPSON FIELD
GUNSHY-THOMPSON FIELD
REDMOND, WA

DESIGN	DRAWN	PROJECT
	KF	1147

SCALE: NTS
DATE: 6-28-2022
REVISED
3

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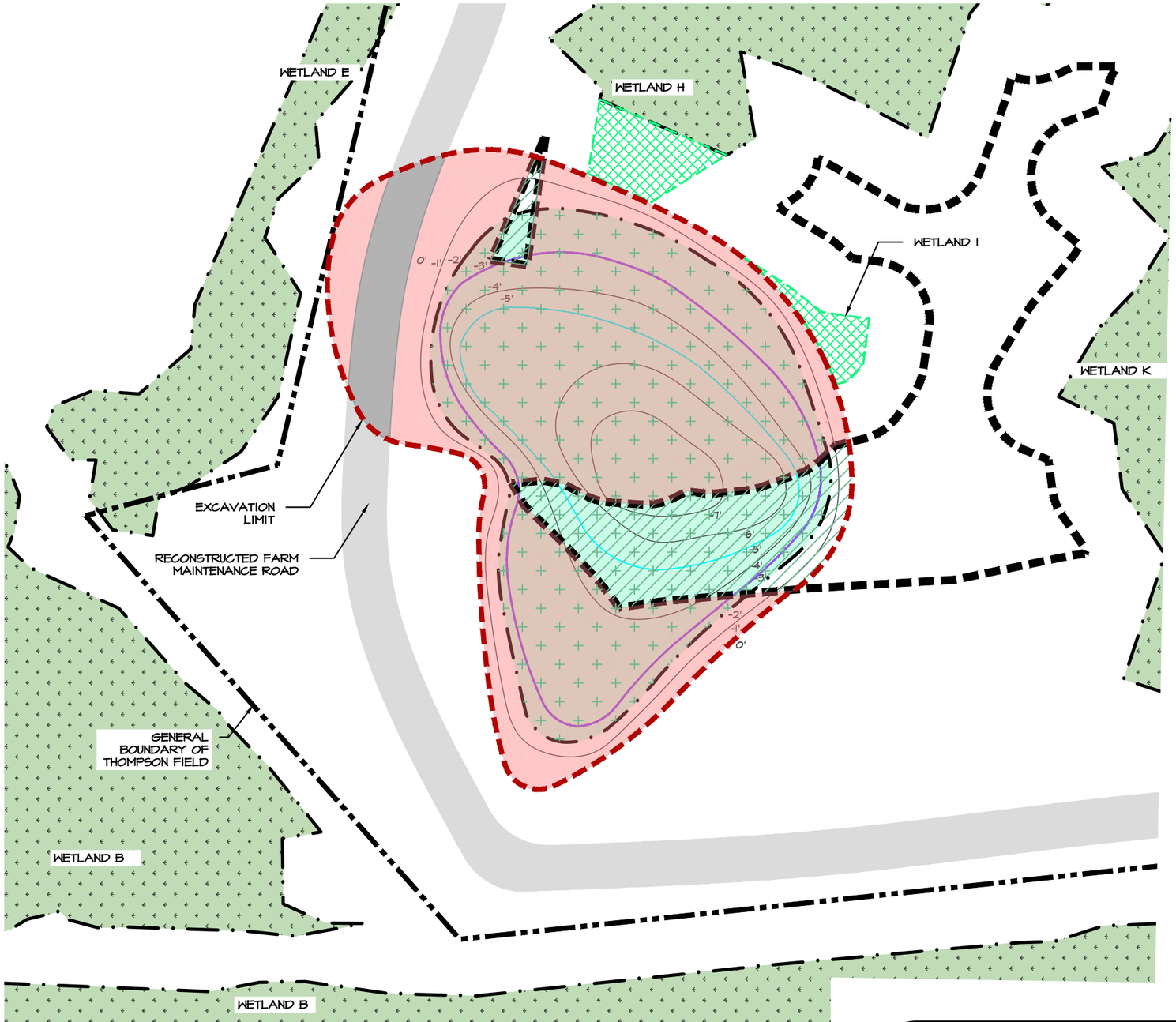
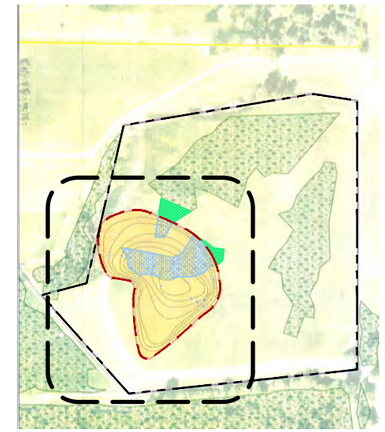
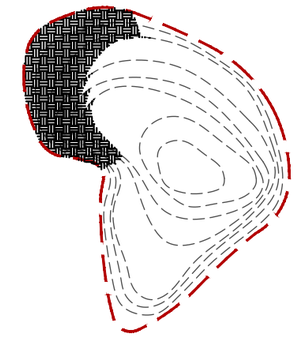




KEY PLAN



INFILL SOIL VOLUME ESTIMATE:
18,334 SF; 510 CY

INFILL LOCATION

PLAN LEGEND

- LIMIT OF CONTAMINATED SOIL EXCAVATION
- GENERAL BOUNDARY OF THOMPSON FIELD
- AREA OUTSIDE OF WETLAND AND STREAM BUFFERS
- EXISTING WETLAND
- AREA OF ENHANCED WETLAND (ESTIMATE 62,637 SF)
- 100 PROPOSED CONTOUR *
- ESTIMATED MAX. WATER LEVEL (WINTER) -3
- ESTIMATED MAX. WATER LEVEL (SUMMER) -5
- RECONSTRUCTED FARM MAINTENANCE ROAD (ESTIMATE 5,287 SF)

IMPACTS LEGEND

- IMPACTED AREA WITHIN BUFFERS: 78,323 SF
- IMPACTED AREA OUTSIDE BUFFERS: 13,450 SF
- INDIRECT WETLAND IMPACT (ESTIMATE 5,040 SF)

*NOTE: CONTOUR ELEVATIONS ARE RELATIVE TO EXISTING FIELD

GRAPHIC SCALE
(IN FEET)
0 40 80 160
SCALE: 1"=80'

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FIGURE #4

CONCEPTUAL GRADING PLAN
GUNSHY-THOMPSON FIELD
REDMOND, WA

DESIGN	DRAWN	PROJECT
	KF	1147

SCALE: NTS
DATE: 6-28-2022
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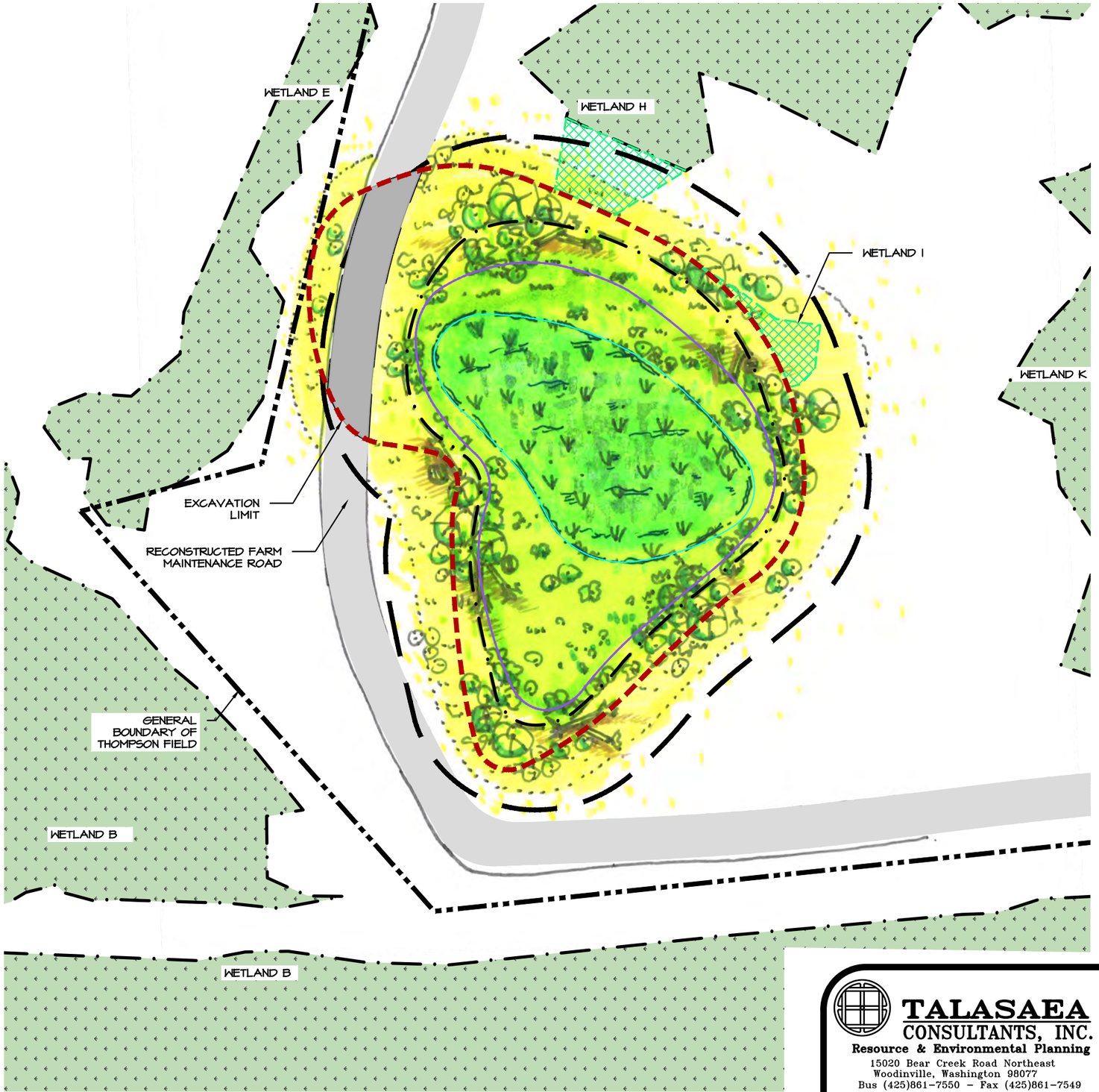

PLANTING LEGEND

- UPLAND ZONE PLANTING
- TRANSITIONAL ZONE PLANTING
- WETLAND ZONE PLANTING
- LARGE WOODY MATERIALS (STUMPS & SNAGS)

PLAN LEGEND

- LIMIT OF CONTAMINATED SOIL EXCAVATION
- GENERAL BOUNDARY OF THOMPSON FIELD
- INDIRECT WETLAND IMPACT (ESTIMATE 5,040 SF)
- EXISTING WETLAND
- PROPOSED WETLAND BOUNDARY (ESTIMATE 62,638 SF)
- PROPOSED WETLAND: 60' BUFFER
- ESTIMATED MAX. WATER LEVEL (WINTER) -3*
- ESTIMATED MAX. WATER LEVEL (SUMMER) -5*
- RECONSTRUCTED FARM MAINTENANCE ROAD (ESTIMATE 5,287 SF)

*NOTE: CONTOUR ELEVATIONS ARE RELATIVE TO EXISTING FIELD

GRAPHIC SCALE
(IN FEET)
0 40 80 160
SCALE: 1"=80'

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FIGURE #5

CONCEPTUAL PLANTING PLAN
GUNSHY-THOMPSON FIELD
REDMOND, WA

DESIGN	DRAWN	PROJECT
	KF	1147

SCALE: NTS
DATE: 6-28-2022
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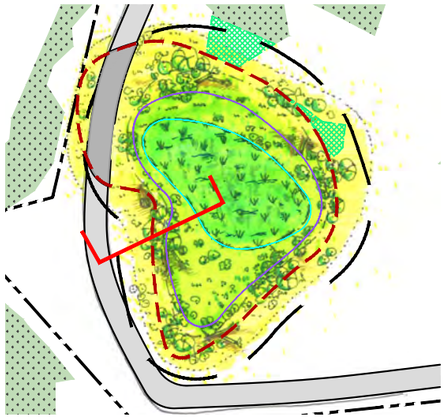

SECTION A-A'

CANDIDATE PLANT LIST

WETLAND ZONE PLANTING

SCIENTIFIC NAME	COMMON NAME
CAREX OBNUPTA	SLOUGH SEDGE
ELEOCHARIS PALUSTRIS	COMMON SPIKE-RUSH
JUNCUS ACUMINATUS	KNOTTY-LEAF RUSH
JUNCUS BUFONIS	TOAD RUSH
JUNCUS TENUIS	LESSER POVERTY RUSH
SCIRPUS CYPERINUS	COTTONGRASS BULRUSH
SCIRPUS MICROCARPUS	SMALL-FRUITED BULRUSH
SCHOENOPLECTUS ACUTUS	CHAIRMAKERS BULRUSH
TYPHA LATIFOLIA	BROAD-LEAF CAT-TAIL

TRANSITIONAL ZONE PLANTING

SCIENTIFIC NAME	COMMON NAME
PICEA SITCHENSIS	SITKA SPRUCE
CRATAEGUS DOUGLASII	BLACK HAWTHORN
FRANGULA PURSHIANA	CASCARA
FRAXINUS LATIFOLIA	OREGON ASH
MALUS FUSCA	OREGON CRABAPPLE
POPULUS BALSAMIFERA SSP. TRICHOCARPA	BLACK COTTONWOOD
SALIX SITCHENSIS	SITKA WILLOW
SORBUS SITCHENSIS	SITKA MOUNTAIN ASH
PHYSOCARPUS CAPITATUS	PACIFIC NINEBARK
RUBUS SPECTABILIS	SALMONBERRY
CORNUS SERICEA	RED-OSIER DOGWOOD

UPLAND ZONE PLANTING

SCIENTIFIC NAME	COMMON NAME
PSEUDOTSUGA MENZIESII	DOUGLAS-FIR
TSUGA HETEROPHYLLA	WESTERN HEMLOCK
ACER MACROPHYLLUM	BIG-LEAF MAPLE
ACER CIRCINATUM	VINE MAPLE
AMELANCHIER ALNIFOLIA	SASKATOON SERVICE-BERRY
GAULTHERIA SHALLON	SALAL
HOLODISCUS DISCOLOR	OCEANSPRAY
MAHONIA NERVOSA	LOW-OREGON GRAPE
MAHONIA AQUIFOLIUM	TALL-OREGON GRAPE
PHILADELPHUS LEWISII	WILD MOCK ORANGE
POLYSTICHUM MUNITUM	SWORD FERN
RIBES SANGUINEUM	RED-FLOWERING CURRANT
ROSA NUTKANA	NOOTKA ROSE
SAMBUCUS RACEMOSA	RED ELDERBERRY
SYMPHORICARPOS ALBUS	COMMON SNOWBERRY
VACCINIUM OVATUM	EVERGREEN HUCKLEBERRY
VACCINIUM PARVIFOLIUM	RED HUCKLEBERRY
DICENTRA FORMOSA	PACIFIC BLEEDING HEART

CONCEPTUAL SECTION

NTS; VERTICAL EXAGGERATION X 3

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FIGURE #6

CONCEPTUAL SECTION & CANDIDATE PLANT LIST
GUNSHY-THOMPSON FIELD
REDMOND, WA

DESIGN	DRAWN	PROJECT
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Appendix A

Gunshy Manor Critical Areas Report and Mitigation Plan (6 January 2017)

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CRITICAL AREAS REPORT AND MITIGATION PLAN UPDATE

GUNSHY MANOR
KING COUNTY, WASHINGTON

Prepared For:

THE ESTATE OF BARBARA J. NELSON.
Redmond, Washington

Prepared By:

TALASAEA CONSULTANTS, INC.
Woodinville, Washington

1 December 2014
(Revised 6 January 2017)

Critical Areas Report and Mitigation Plan
-Update-

Gunshy Manor
King County, Washington

Prepared for:

The Estate of Barbara J. Nelson
16508 NE 79th Street
Redmond, Washington 98072

Prepared by:

Talasaea Consultants, Inc.
15020 Bear Creek Road NE
Woodinville, Washington 98077
425-861-7550

1 December 2014
(Revised 6 January 2017)

Executive Summary

REPORT TYPE: Critical Areas Report and Mitigation Plan - Revised

REPORT NAME: Gunshy Manor Critical Areas Report and Mitigation Plan

SYNOPSIS OF REPORT UPDATE: This report is an update of our Critical Areas Report for Gunshy Manor, dated 1 December 2014 based on additional field observations and including mitigation details as discussed with agency staff. The purpose of the additional field observations was to confirm and refine the wetland delineation boundaries.

LOCATION: The Property is an irregularly-shaped group of six parcels located south of and abutting NE Union Hill Road, abutting and extending approximately 1,300 feet east from 196th Avenue in King County, Washington. The King County tax parcels that comprise the Property are 0825069013 (Parcel A), 0825069103 (Parcel B), 0825069104 (Parcel C), 0825069105 (Parcel D), 0825069012 (Parcel E), and 0825069102 (Parcel F). The Public Land Survey System location is the NW ¼ of Section 8, T25N, R6E, Willamette Meridian.

REPORT STAFF: Bill Shiels, Principal; David R. Teesdale, PWS, Senior Wetland Ecologist; Jennifer M. Marriott, PWS, Senior Ecologist.

CLIENT: The Estate of Barbara J. Nelson.

FIELD SURVEY: Initial field survey was performed on 18 May 2012. Additional field work was performed on 14, 19, 21, and 26 August 2014; 15 February, 7, 8, 21, 22 April, and 16 May 2015; 12 February, 8 March, 8, 14 November, and 9 December 2016.

SITE LOCATION: Gunshy Manor is an irregularly-shaped, approximately 124-acre property. An approximately 66-acre area of the Property is currently developed with a single-family residence, a guest house, associated outbuildings and storage sheds, barns, and farm fields used for livestock grazing and hay production.

DETERMINATION: Nine wetlands, four fish-bearing farm ditches, and three streams were identified on the Property. The farm ditches are named Farm Ditch 1, Farm Ditch 2, Farm Ditch 3, and Spur Farm Road Ditch. The streams are named Martin Creek, Evans Creek, and Stream 1. The wetlands are named Wetlands A, B, C, D, E, G, H, I, and K (Wetland F was later determined to be a part of Wetland B and the letter "J" was inadvertently skipped as a wetland name). Wetland A is associated with Farm Ditch 2. Wetland B is an extension onto Gunshy Manor of the Evans Creek Natural Area. Wetland B is associated with Farm Ditch 1, Stream 1, and Evans Creek. Wetland C is not associated directly with any of the Farm Ditches. It is located adjacent to the prism of 196th Avenue NE (Red Brick Road). Wetland D is associated with Farm Ditch 2 and Evans Creek. Wetland E is associated with Farm Ditch 2. Wetland G is associated with Farm Ditch 1. Wetland H is located in the northeastern portion of the Thompson Hay Field and is associated with Farm Ditch 2. Wetland I is located in the western portion of the Thompson Hay Field. This wetland is not associated with any onsite ditches or streams. Wetland K is located in the southeastern portion of the Thompson Hay Field and is associated with Farm Ditch 2.

There is no hydrologic connectivity between the wetland areas on either side of the Loop Farm Road. Wetland B (and by extension, the Evans Creek Natural Area) is not hydrologically connected to the Thompson Hay Field, nor is the Thompson Hay Field hydrologically connected or providing support to Wetland B or any other delineated wetland on Gunshy Manor. All onsite wetlands, except for Wetland C, drain either to Farm Ditch 1 or Farm Ditch 2. Wetland C is connected to Evans Creek via a pump system. Observed hydrologic differences between Wetland B and Wetland D satisfy Washington Department of Ecology's guidance on separating wetland units for rating purposes.

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Martin Creek and Stream 1 flow directly to Evans Creek. Farm Ditches 1, 2, and 3 eventually combine and flow into Evans Creek. The Spur Farm Road Ditch flows east to west along the south side of the Spur Farm Road and discharges into Evans Creek. The following table contains the King County ratings, Cowardin classifications, and standard buffer widths for each of the onsite wetlands and fish-bearing waters.

Wetland and Stream Summary Table (Gunshy Manor Farm Exhibit is contained in Appendix C)

Wetland Name	Name on Gunshy Manor Farm Exhibit	Wetland/Stream Rating per King County	Cowardin Classification (wetlands only)	Standard Buffer Width (feet) per King County
Wetland A	Not Named	Category IV	PEM	50
Wetland B	Not Named	Category I	PFO/SS	225
Wetland C	Not Named	Category III	PEM	75
Wetland D	Not Named	Category III	PEM	75
Wetland E	Not Named	Category III	PFO	75
Wetland G	Not Named	Category IV	PEM	50
Wetland H	Not Named	Category IV	PEM	50
Wetland I	Not Named	Category IV	PEM	50
Wetland K	Not Named	Category IV	PEM	50
Martin Creek	Not Named	F	N/A	165
Evans Creek	Evans Creek	F	N/A	165
Stream 1	Gunshy Ridge Stream	F	N/A	165
Farm Ditch 1	South Farm Ditch	F	N/A	165
Farm Ditch 2	North Farm Ditch	F	N/A	165
Farm Ditch 3	Not Named	F	N/A	165
Spur Farm Road Ditch	Not Named	F	N/A	165

MITIGATION PLAN: Proposed mitigation will include the following mitigation elements: lowering base elevation of the Spur Farm Road; reduce width of Loop and Burn Pile Farm Roads; adding a meander to Farm Ditch 1; additional plantings of native species to be added throughout the site at targeted areas as agreed upon, including segments of Evans Creek. Not all mitigation elements are proposed to all agencies. A summary of which mitigation elements are provided to which specific agencies is outlined in Section 5 of the Critical Areas Report. An outline of the performance monitoring and maintenance associated with each mitigation element is outlined within this report and a more detailed outline is provided within Appendix F.

A financial guarantee will be provided by the Applicant pursuant to the requirements of King County Code (KCC) 21A.24.140 and KCC Title 27A.20 for those mitigation elements required by King County. Mitigation elements provided for other agencies, excluding King County, will not be included within this financial guarantee as this type of bonding is not required by the EPA.

REPORT'S INTENDED USE: This report is intended to accompany an application for a King County Grading Restoration Permit regarding King County Code Enforcement File # ENFR14-0512, an application for Critical Areas Designation for review by the King County Department of Permitting and Environmental Review (DPER). This report is also intended for the Client's submission to the Washington Department of Ecology and the U.S. Environmental Protection Agency.

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Table of Contents

Executive Summary i
Table of Contents iii
List of Tables, Figures, Appendices iv

Chapter 1. Introduction 1
1.1 Report Purpose 1
1.2 Statement of Accuracy 1

Chapter 2. Property Overview 1
2.1 Property Location 1
2.2 Report's Intended Use 2
2.3 Existing Site Conditions 2
2.4 Gunshy Manor Historical Uses 4

Chapter 3. Methodology 5
3.1 Background Data Reviewed 5
3.2 Field Investigation 6

Chapter 4. Results 8
4.1 Analysis of Existing Information 8
4.1.1 National Wetland Inventory 8
4.1.2 Natural Resources Conservation Service 8
4.1.3 King County Critical Areas Map 9
4.1.4 Analysis of Precipitation Patterns 9
4.2 Analysis of Field Conditions 11
4.2.1 Wetlands 13
4.2.2 Streams and Farm Ditches 21

Chapter 5. Mitigation plan 24
5.1 Mitigation Design Elements 24
5.1.1 South Farm Ditch (Farm Ditch 1) Meander (EPA/DOE/King County) 24
5.1.2 Spur Farm Road (EPA/DOE/King County) 25
5.1.3 Loop Farm Road (EPA/DOE/King County) 25
5.1.4 Burn Pile Farm Road (EPA/DOE/King County) 25
5.1.5 Supplemental Plantings 25
5.2 Mitigation Construction and Monitoring Elements 26
5.2.1 Temporary Irrigation System 26
5.2.2 Construction BMPs 26
5.2.3 Performance Monitoring and Maintenance 26
5.2.4 Contingency Measures 27
5.2.5 Financial Guarantee 27

Chapter 6. Report's Intended Use 27

Chapter 7. Summary 27

Chapter 8. References 29

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List of Tables

Table 1. List of and General Descriptions of Gunshy Manor Farm Roads and Pastures 2
Table 2. Water Feature Names. 4
Table 3. Summary of Mitigation Elements. 24

List of Figures

Figure 1 – Vicinity Map
Figure 2 – Site Map
Figure 3 – NWI Map – Redmond Quadrangle
Figure 4 – NRCS Soils Map for King County Area
Figure 5 – King County Critical Areas Map
Figure 6A – Critical Area Location Map
Figure 6B – Critical Area Location Map
Figure 7 – Wetlands B and D Location and Flood Flow Direction Map
Figure 8 – One Foot LiDAR Topography Map of Wetlands B and D

List of Appendices

Appendix A: Gunshy Manor Farm Exhibit
Appendix B: Problematic Hydrophytic Vegetation
Appendix C: Normal Precipitation Curves
Appendix D: Wetland Datasheets
Appendix E: Wetland Rating Sheets
Appendix F: Final Restoration and Mitigation Work Plan

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Chapter 1. INTRODUCTION

1.1 Report Purpose

This report is the result of a critical areas study of the Gunshy Manor property (referred to hereinafter as the Property). The Property is located southeast of the intersection of NE Union Hill Road and 196th Avenue NE in King County, Washington (**Figure 1**). The purpose of this report is to identify and describe critical areas located on and adjacent to the Property (including wetlands, streams, and critical habitats), as well as outline the mitigation intended to satisfy agencies involved.

The report has been prepared to comply with the requirements of King County Code Chapter 21A.24 (Critical Areas). Specifically, this report provides the following information:

- General property description;
- Methodology for critical areas investigations;
- Critical species review;
- Results of critical areas background reviews and field investigations; and
- Regulatory review
- Mitigation approach and design
- Site specific goals, objectives, and performance standards
- Construction sequencing
- Monitoring and maintenance plan
- Adaptive management and contingency plan

1.2 Statement of Accuracy

The critical area studies and regulatory reviews were conducted by trained professionals of Talasaea Consultants, Inc., in adherence to the protocols, guidelines, and generally accepted industry standards available at the time work was performed. The conclusions in this report are based on the results of analyses performed by Talasaea Consultants and represent our best professional judgment. To that extent, and within the limitations of project scope and budget, we believe the information provided herein is accurate and true to the best of our knowledge. Talasaea Consultants does not warrant any assumptions or conclusions not expressly made in this report, or based on information or analyses other than what is included herein.

Chapter 2. PROPERTY OVERVIEW

2.1 Property Location

The Property is located east of 196th Avenue NE (the Red Brick Road) and south of NE Union Hill Road in King County, Washington (**Figure 2**). The King County tax parcel numbers for the Property are 0825069013 (Parcel A), 0825069105 (Parcel B), 0825069104 (Parcel C), 0825069103 (Parcel D), 0825069012 (Parcel E), and 0825069105 (Parcel F). The Public Land Survey System location is the NW ¼ of Section 8, T25N, R6E, Willamette Meridian.

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2.2 Report's Intended Use

This report is intended to accompany both an application for a King County Grading Restoration Permit regarding King County Code Enforcement File # ENFR14-0512 and a Critical Areas Designation for review by the King County Department of Permitting and Environmental Review (DPER). This report is also intended for the Client's submission to the U.S. Environmental Protection Agency (EPA) and to the Washington State Department of Ecology (ECY).

2.3 Existing Site Conditions

Gunshy Manor is an irregularly shaped property consisting of six parcels and totaling approximately 124 acres in size (**Figure 2**). It is located east of the Redmond City limits and south of NE Union Hill Road. Parcel A is developed with equestrian and residential improvements and facilities. Portions of Parcels B, C, D, E, and F (portions that for the most part are located roughly in the central portion of the Property) are used for livestock grazing and hay production and storage. There is a single residence located in the northwestern portion of Parcel E and multiple residences located on Parcel A. The remainder of the Property is generally undeveloped and forested.

The topography of the western and central portions of the Property is generally flat to slightly rolling. The eastern portion is characterized by moderate to steep slopes.

There are two points of roadway access to the Property. One access point to the Property is a paved driveway off of NE Union Hill Road. This driveway extends to the south-southeast and connects to a gravel farm road that provides access to the remainder of the Gunshy Manor property. The second access point is a gravel farm road off of 196th Avenue NE (Red Brick Road) that extends generally to the east into the Property.

The Property has several pastures serviced by several existing farm roads. The locations of the existing farm roads and pastures are illustrated on the Gunshy Manor Farm Exhibit, **Appendix A**, and are described in **Table 1** below.

Table 1. List of and General Descriptions of Gunshy Manor Farm Roads and Pastures

Feature Name	Property Location	General Description
Farm Entrance off Brick Road	Parcel E	A gravel access farm road off of Red Brick Road. (Note that a gravel access driveway extending east from the same access point off of Red Brick Road and on a slight skew to the north of the farm entrance off of the Red Brick Road originally served the existing manufactured home in the northwest portion of Parcel E. That access driveway has been replaced by a much shorter gravel driveway extending to the north from the farm entrance off of the Brick Road to serve the existing manufactured home.)
Spring Farm Road	Parcel B	A gravel loop farm road connecting the Farm Entrance off Brick Road to the Main Farm Road.

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Feature Name	Property Location	General Description
Burn Pile Farm Road	Parcel B	A small gravel spur farm road off of the Farm Entrance off Brick Road providing access to the farm's burn pile area.
Main Farm Road	Parcels A, B, C, D, and F	A north-south gravel farm road connecting the Loop Farm Road to the entrance off of NE Union Hill Road.
Loop Farm Road	Parcels D, E, and F	A gravel farm road that connects the Main Farm Road to the Farm Entrance off Brick Road.
Spur Farm Road	Parcel E	A dirt farm road that extends westerly off of the Loop Farm Road along most of the south edge of the Summer Pasture, crossing the South Farm Ditch and extending to within approximately 80 feet of Evans Creek.
Trail Farm Road	Parcels D and F	The segment of the Trail Farm Road immediately north of the Loop Farm Road is a gravel farm road that extends along the west edge of the Gunshy Manor forest. North of that segment, Trail Farm Road is a dirt farm road.
South Corral Pasture	Parcel A	Located at the southwestern corner of Parcel A and north of the Burn Pile Farm Road.
Log Cabin Pasture	Parcels A and B	Located south of the Log Cabin.
1st Lower Turnout Pastures	Parcels B and C	Located west of the Main Farm Road, east of the North Farm Ditch, and north of the Run-in Shed that lies to the Main Farm Road's west side.
1st Upper Pasture	Parcels B and C	Located east of the Main Farm Road and north of the Run-in Shed that lies to the Main Farm Road's east side.
Back Lower Pasture	Parcels C, D and F	Located west of the Main Farm Road, East of the Loop Farm Road, and south of the Run-in Shed that lies to the Main Farm Road's west side.
Back Upper Pasture	Parcels C, D and F	Located east of the Main Farm Road and south of the Run-in Shed that lies to the Main Farm Road's east side.
Thompson Hay Field	Parcel E	Thompson Hay Field is a large field bordered by the Loop Farm Road and South Farm Ditch on its western extents, by the North Farm Ditch on its eastern and northern extents, and by the Loop Farm Road on its southern extent.
Summer Pasture	Parcel E	The Summer Pasture is bounded by the South Farm Ditch on its eastern extent, the Spur Farm Road on its southern extent and the North Farm Ditch on its northern extent. The western boundary is defined by Evans Creek.

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Feature Name	Property Location	General Description
Double Wide Pasture	Parcel E	The Double Wide Pasture is a small pasture located in the northwestern corner of Parcel E. Its eastern extent is defined by a fence line located east of the Doublewide Manufactured Home that extends north from the Farm Entrance off Brick Road to Parcel E's north property line. Its southern boundary is defined by the Farm Entrance off Brick Road, while its west and north boundaries are Parcel E's west and north boundaries, respectively.
Goat Pasture	Parcel E	The Goat Pasture is located east of the Double Wide Pasture. The northern extent is defined by the northern boundary of Parcel E. The southern and eastern extents are defined by the Farm Entrance off Brick Road.
Pasture across from the Double Wide	Parcel E	The Pasture across from the Double Wide is bounded by the Farm Entrance off Brick Road to the north and the North Farm Ditch on its eastern and southern extents. The western extent is the west boundary of Parcel E.

The Gunshy Manor Farm Exhibit also names the various water features located on the Property. These names differ from the names utilized in this Critical Areas Report. **Table 2** contains a cross reference for water feature names used in this report and names of those same features labeled on the Gunshy Manor Farm Exhibit (**Appendix A**).

Table 2. Water Feature Names.

Feature Name in Critical Areas Report	Feature Name in Gunshy Manor Farm Exhibit
Martin Creek	Not Named
Evans Creek	Evans Creek
Stream 1	Gunshy Ridge Stream
Farm Ditch 1	South Farm Ditch
Farm Ditch 2	North Farm Ditch
Farm Ditch 3	Not Named
Spur Farm Road Ditch	Spur Farm Road Ditch

2.4 Gunshy Manor Historical Uses

The Nelson Family originally purchased approximately 138 acres of property known as Gunshy Manor in 1957. Over the following approximately 55 years, the Nelson Family operated on the Gunshy Manor property one of Washington's most successful Thoroughbred and Polled Hereford breeding farms. Known especially for their Thoroughbred race horses, the Nelsons started with riding-horses, then in 1962 bred at Gunshy Manor their first racehorse, the stakes-placed Roman Mutiny. Among the many fine stakes horses Gunshy Manor subsequently bred were three Gottstein Futurity

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winners: Washington Champion 2-year-old Prince Joda (1971), Krupa (1985) and the filly Favored One (1994), whose granddaughter Lexie Lou defeated 14 males in the 2014 Queen's Plate, Canada's equivalent race to the Kentucky Derby. Gunshy Manor also bred Washington Champions Norm's Nephew (2005 3-year-old colt) and Margo's Gift (2007 2-year-old & 2008 3-year-old-colt or gelding). Margo's Gift won the Breeder's Cup Stakes for six furlongs at Monmouth Park and is one of Washington-Bred horses all-time money earners. Gunshy Manor bred an additional 14 stakes winners, stood stallions Exclusive Listing, Put Em Up and Drumboogie, and regularly ranked among the State's top five breeders both in wins and earnings (No. 1 in 2007). In addition to Gunshy Manor's distinguished Thoroughbred breeding history, the farm has in the past and today continues to produce, on average, 120 tons of high quality Timothy, Tall Fescue, and Pasture Grass hay, hay that it sells locally to farms in the Sammamish and Evans Creek valleys.

On August 16, 2014, Gunshy Manor received the State of Washington Thoroughbred Industry highest honor being inducted into the Washington Thoroughbred Hall of Fame.

Chapter 3. METHODOLOGY

The critical areas analysis of the Property involved a two-part effort. The first part consisted of a preliminary assessment of the Property and the immediate surrounding area using published environmental information. This information included:

1. Wetland and soils information from resource agencies;
2. Environmentally Critical Areas Map information from King County;
3. GIS analysis of orthophotography and LiDAR data; and
4. Relevant studies completed or ongoing in the vicinity of the Property supplied to us by the Client (including historical uses of the Property).

The second part consisted of site investigations where direct observations of existing environmental conditions were made. Plant communities, soils, hydrology, and stream conditions were observed. This information was used to help characterize onsite wetlands and define the limits of the Ordinary High Water Mark (OHWM) of streams and fish-bearing farm ditches for regulatory purposes (see **Section 3.2 – Field Investigation**, below).

3.1 Background Data Reviewed

Background information from the following sources was reviewed prior to field investigations:

- U.S. Fish and Wildlife National Wetlands Inventory for the Redmond Quadrangle;
- Natural Resources Conservation Service Soil Survey for the King County Area;
- King County GIS database;
- StreamNet and SalmonScape databases;
- Weather Data from NCDC and Online sources;

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- Orthophotography from Earth Explorer, National Historical Aerials, NAIP, Bing Maps, and Google Earth;
- LiDAR terrain data 2012 from the City of Redmond.

3.2 Field Investigation

The Property was initially evaluated in the field by Talasaea Consultants, Inc. on 18 May 2012; between 19 and 26 August 2014; was further evaluated in the field on 15 February, 7, 8, 21, 22 April, and 16 May 2015; 12 February, 8 March, 11 and 14 November, and 9 December 2016. Existing site conditions were recorded, including relevant information concerning onsite and offsite wetlands and streams. The OHWM for onsite streams and the OHWM for fish-bearing farm ditches were located and flagged in the field using wire flags. OHWM was delineated using the methodology described in *Determining the Ordinary High Water Mark on Streams in Washington State* (Olson and Stockdale 2010).

Wetlands were delineated using the methodologies described in Chapter 5 of the U.S. Army Corps of Engineers *Regional Supplement to the Corps of Engineers Wetland Delineation and Identification Manual: Western Mountains, Valleys, and Coast Region* (U.S. Army Corps of Engineers, 2010). The methodology provided in this chapter is appropriate for atypical situations where one or more wetland indicators has been modified, or is missing, due to natural, or human-induced impacts. This methodology was selected because (1) much of the Property has been actively farmed for the past 58 years and, (2) the fields have been and are continuing to be used for grazing of cattle and horses, and for hay production. As a result of such farming activities, it is very likely that (a) wetland indicators have been altered to some degree, and (b) onsite vegetation has been significantly altered (especially due to active vegetation management in support of grazing and production of high-quality grasses for hay).

To determine the presence of wetland vegetation on Gunshy Manor, Talasaea utilized the methodology for Managed Plant Communities where analysis of hydrophytic vegetation was not reliable or possible. This included comparing certain areas of managed fields located within the Property with the Evans Creek Natural Area, which is located to the south of Parcel E (See **Appendix B – Problematic Hydrophytic Vegetation**). In areas of the Property's managed fields, where the original unmanaged vegetation pattern could not be determined through comparison with unmanaged reference sites, Talasaea utilized indicators of hydric soils and wetland hydrology to infer the likelihood that, but for the current land management activities, hydrophytic vegetation would be present.

Determination of hydric soils on Gunshy Manor was not in question since the site contains mapped hydric soils, which we also confirmed in the field. Soil management practices appear not to have significantly disturbed the presence of positive hydric soil characteristics.

Determination of "normal conditions" for establishing wetland hydrology for the wetlands on Gunshy Manor was by performing a climate analysis for normal water year conditions using the methodology per Sprecher and Warne (2000). The Corps defines

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wetland hydrology as "…14 or more consecutive days of flooding or ponding, or a water table 12 inches or less below the soil surface, during the growing season at a minimum frequency of 5 years in 10 (50 percent or higher probability)…" The minimum 50 percent frequency is also called "normal circumstances." The methodology described by Sprecher and Warne determines if normal climate conditions were present at the time wetland boundary evaluations were made. In this way, patterns of precipitation for a particular time of year can be evaluated and confirmed as showing "normal conditions" to satisfy the Corps definition of wetland hydrology. Normal precipitation curves were generated for various years of site evaluations. These curves are contained in **Appendix C**.

The OHWM and wetland flag locations for our 18 May 2012 report were not formally surveyed. The purpose of our 18 May 2012 report was to assist in obtaining King County approval of boundary line adjustments of some of the Property's internal parcel boundaries. The locations of OHWM and wetland flags were approximated using a hand-held Topcon GMS-2 GPS receiver. Subsequent delineation and/or re-establishment of wetland and OHWM boundaries were formally surveyed by State-licensed surveyors from ESM Consulting Engineers, LLC.

Plant species were identified according to the taxonomy of Hitchcock and Cronquist (Hitchcock, *et al*. 1973). Taxonomic names were updated and plant wetland status was assigned according to North American Digital Flora: National Wetland Plant List, Version 2.4.0 (Lichvar, *et al*. 2012). Wetland classes were determined with the U.S. Fish and Wildlife Service's system of wetland classification (Cowardin, *et al*. 1979). Vegetation was considered hydrophytic if greater than 50% of the dominant plant species had a wetland indicator status of facultative or wetter (i.e., facultative, facultative wetland, or obligate wetland).

Wetland hydrology was determined based on the presence of hydrologic indicators listed in the above-mentioned Corps Regional Supplement. These indicators are separated into Primary Indicators and Secondary Indicators. To confirm the presence of wetland hydrology, one Primary Indicator or two Secondary Indicators must be demonstrated to exist. Indicators of wetland hydrology may include, but are not necessarily limited to: drainage patterns, drift lines, sediment deposition, watermarks, stream gauge data and flood predictions, historic records, visual observation of saturated soils, and visual observation of inundation.

Soils on the site were considered hydric if one or more of the hydric soil indicators listed in the Corps Regional Supplement are present. Indicators include presence of organic soils, reduced, depleted, or gleyed soils, or redoximorphic features in association with reduced soils.

An evaluation of patterns of vegetation, soil, and hydrology was made along the interface of wetland and upland. **Appendix D** contains USACE Wetland Determination forms completed by Talasaea for representative locations in both upland and wetland locations. These data forms document the vegetation, soils, and hydrology information that aided in the wetland boundary determination. While datasheets are typically paired

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with a wetland and upland point to reflect the conditions of the wetland boundary at that point, not all of the added datasheets are paired.

Patterns of precipitation for the 2009 to 2012, and 2014 to 2015 water years were compared against normal precipitation curves generated from a WETS table for a local NCDC weather station. The methodology for this analysis is derived from research work performed by Sprecher and Warne (2000). Curves for these water years are contained in **Appendix C** along with a brief discussion of the methodology.

Chapter 4. RESULTS

4.1 Analysis of Existing Information

4.1.1 National Wetland Inventory

The National Wetland Inventory (NWI) map for the Redmond Quadrangle identifies several wetlands in the vicinity of the Property with two in direct proximity of the property boundaries (**Figure 3**). These wetlands are all associated with Evans Creek, which flows adjacent to a portion of the Property's west boundary with 196th Avenue NE (Red Brick Road). The NWI identifies one palustrine forested wetland that is temporarily flooded (PFOA) along the southeastern corner of Parcel E, one palustrine forested/scrub-shrub wetland along the southwestern corner of Parcel E, and one palustrine emergent wetland that is temporarily flooded (PEMA) on the western boundary of Parcel E. It should be noted that the National Wetland Inventory Map for the Redmond Quadrangle was created in 1981 through interpretation of colorized infrared aerial photographic images taken in 1973, 1980, and 1981. Conditions currently seen on the subject property may not be reflected on the NWI map due to natural changes in hydrology and land-use practices.

4.1.2 Natural Resources Conservation Service

The National Resources Conservation Service Soil Survey for King County Area indicates four soil types on the Project site (**Figure 4**). These soils are Alderwood-Kitsap soil, Everett gravelly sandy loam, Norma sandy loam, and Seattle muck.

The Alderwood-Kitsap soil is a soil generally found on very steep slopes. It is comprised of approximately 50-percent Alderwood gravelly sandy loam, approximately 25-percent Kitsap silt loam, and the remainder consisting of various associated soil types. Slopes within this soil type unit can range from 25 percent to 70 percent.

Everett gravelly sandy loam is a nearly level to undulating, somewhat excessively drained soil. It formed in gravelly glacial outwash under conifers. The surface is typically very dark brown gravelly sandy loam. The subsoil is dark yellowish-brown gravely sandy loam.

Norma sandy loam is a very deep, poorly drained soil in depressional areas of outwash plains and till plains. It is formed in alluvium. Typically, the surface area is very dark gray loam to a depth of about 10 inches from the ground surface. The subsoil is dark grayish brown sandy loam to about 18 inches. The substratum is dark gray sandy loam to about 60 inches.

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Seattle muck is made up of very poorly drained organic soils that formed in materials derived primarily from sedges. These soils are found in depressions and valleys on the glacial till plains and in river and stream valleys. The representative profile is a surface layer (approximately 11 inches) of black muck underlain by dark reddish-brown, black, very dark brown, and dark brown muck and peaty muck extending to 60-inches or more.

The Alderwood-Kitsap and Everett soil series are not considered hydric by the National Technical Committee on Hydric Soils (NTCHS). Norma sandy loam and Seattle muck are considered Hydric by the NTCHS.[1]

4.1.3 King County Critical Areas Map

King County maps one large wetland partially adjacent to and partially within the Property (**Figure 5**). This wetland is associated with Evans Creek. That mapped wetland is depicted on **Figure 5** as encompassing (a) roughly the south half of Parcel E and west edge portions of parts of Parcels C, D, and F and (b) almost the entirety of the Property immediately to the south of Parcel E, property that is owned by King County and is managed as a natural area (called the Evans Creek Natural Area). The Evans Creek Natural Area (ECNA) wetland is identified as a King County Category I wetland.

King County maps three streams on or adjacent to the Property. One stream is identified by the County as Evans Creek, which is mapped as a King County Type F (fish-bearing) stream. Evans Creek generally flows adjacent to the southerly three-fourths of the western boundary of Parcel E. A second stream on the County map (a stream not designated on the County map as to Type) is depicted as flowing from east to west through Parcel F. This stream, which appears to be the stream referred to in this report as Stream 1, flows into the aforementioned ECNA wetland and eventually drains into Evans Creek. The third stream depicted on the County map is Martin Creek, which crosses the Property at its northern terminus (the north end of Parcel A).

4.1.4 Analysis of Precipitation Patterns

We analyzed the patterns of precipitation preceding our 2012 and 2014 field work on Gunshy Manor to help determine the cause of the differences in our field findings observed between these two years in particular. We further analyzed the patterns of precipitation for the 2009 to 2011 and 2015 water years to encompass all of our onsite wetland delineation work.

Our analysis of precipitation patterns preceding our 2012 and 2014 field work looked at both the amount of rain that fell preceding the wetland delineations conducted in these two years and the number of consecutive days without rainfall. A “rain-free period” was considered to be two or more consecutive days with no rain. The standard duration of observation was considered to be 90 days prior to the delineation date. This number is consistent with the standard period of observation for determining normal precipitation

[1] The Soil Survey for King County Area was published in 1973 and may not accurately reflect all onsite conditions.

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(one month, two months, and three months for the NRCS methodology, and 30 days, 60 days, and 90 days for the Sprecher and Warne methodology).

Over the 90 days prior to our 18 May 2012 delineation, approximately 16.25 inches of rain fell in the vicinity of Gunshy Manor. There were seven rain-free periods over the 90 days prior to 18 May 2012. The total number of rain-free days within these seven periods was 28. The longest rain-free duration period was nine days. The average duration of rain-free periods for the 90-days prior to 18 May 2012 was 4 days. The average precipitation in inches for the 90 days prior to 18 May 2012 (excluding rain-free periods) was 0.29 over 62 days. These rain-free periods were generally evenly spaced over the 90-days prior to our 2012 delineation.

Over the 90 days prior to our 14 August 2014 delineation, approximately 5.79 inches of rain fell in the vicinity of Gunshy Manor. There were seven rain-free periods over the 90 days prior to 14 August 2014. The total number of rain-free days within these seven periods was 57. The longest rain-free duration period was 20 days. The average duration of rain-free periods for the 90 days prior to 14 August 2014 was 8 days. The average precipitation in inches for the 90 days prior to 14 August 2014 (excluding rain-free periods) was 0.19 inches over 33 days. These rain-free periods generally occurred closer to the date of our 2014 delineation.

Several events occurred in 2015 on Gunshy Manor. The most notable event was an 18 February 2015 site review with King County and other agency personnel. This was followed up with wetland boundary revision work on 7 and 8 April, and an evaluation of existing conditions on the Thompson Hay Field on 21 and 22 April.

Over the 90 days prior to the 18 February 2015 site review with King County and other agency personnel, approximately 17.6 inches of rain fell in the vicinity of Gunshy Manor. There were seven rain-free periods. The total number of rain-free days within these seven periods was 13. The average duration of rain-free periods was 2.6 days. The longest rain-free duration was four days. The average precipitation in inches for the 90 days prior to 18 February 2015 (excluding rain-free periods) was 0.23 inches over 78 days. The rain-free periods were generally evenly spaced throughout the 90-day period prior to the 18 February 2015 site visit.

Over the 90 days prior to our 7 April 2015 wetland boundary revision work, approximately 13.41 inches of rain fell in the vicinity of Gunshy Manor. There were six rain-free periods over the 90 days prior to the 7 April 2015 wetland boundary revision work. The total number of rain-free days within these six periods was 26. The average duration of rain-free periods was 4.3 days. The longest rain-free period was 10 days. The average precipitation in inches for the 90 days prior to 7 April 2015 (excluding days with 0 inches of precipitation) was 0.21 inches over 64 days. These rain-free periods occurred within 29 days of the wetland boundary revision work.

Over the 90 days prior to our 21 April 2015 evaluation of existing conditions on the Thompson Hay Field, approximately 12.72 inches of rain fell in the vicinity of Gunshy Manor. There were seven rain-free periods. The total number of rain-free days within

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these seven periods was 44. The longest rain-free period was ten days. The average duration of rain-free periods was 5.6 days. The average precipitation for the 90 days prior to 21 April 2015 (excluding rain-free periods) was 0.19 inches. The rain-free periods were concentrated near the beginning and the end of the 90 days prior to 21 April 2015.

We further analyzed the 90-day datasets for skew, which measures the degree to which a dataset differs from a normal curve (asymmetry). Results of the skew test can be positive or negative. Positive skew indicates that the asymmetry is to the left of the mean and negative skew indicates that the asymmetry is to the right of the mean. The value of the skew indicates the degree to which the curve is asymmetrical (i.e., how much the median differs from the mean).

For the 90 days prior to 18 May 2012, the skew value was 1.8, and for the 90 days prior to 14 August 2014, the skew value was 4.8. This suggests that the pattern of rainfall for the 90 days prior to 18 May 2012 was much more evenly distributed over the 90-day period and more closely centered around the arithmetic mean than the pattern of rainfall for the 90 days prior to 14 August 2014. Less rain fell during the 90 days prior to 14 August 2014 than during the 90 days prior to the 18 May 2012 period. For the 90 days prior to 7 February, 7 April, and 21 April 2015, the skew values were 2.85, 3.96, and 4.16 respectively. The large positive skew values are indicative of two large rain events that occurred in the early portions of the 90 day timespans in 2015.

We have noted that significant rain events occurred on 23 July 2014, 28 November 2014, and 15 March 2015, when 1.33, 1.92, and 2.21 inches of rain fell within a 24-hour period, respectively. These are uncharacteristically large amounts of rain to fall in the Pacific Northwest in a 24-hour period. These one-day rain events were sufficient to move the 30-day rolling total precipitation to wetter than normal conditions. Due to the way the precipitation curves are calculated, these anomalous rain events affect the analysis of normal precipitation for 30 days, after which it drops out of the equation for the 30-day rolling total. We believe that the patterns of precipitation without these unusual rain events would likely have been between normal and drier than normal. In our professional opinion, the significant amounts of rainfall preceding our field work in 2015 likely expanded the apparent presence of wetland hydrology beyond where it would likely be under “normal conditions.”

4.2 Analysis of Field Conditions

Nine wetlands, three fish-bearing streams, and four fish-bearing farm ditches were identified, delineated, and mapped on or adjacent to the Property during our August 2014 site evaluation. These delineations were refined further in the November 2016 site visit with those revised wetland boundaries reflected on **Figure 6**. The three streams are Evans Creek, Martin Creek, and Stream 1. Stream 1 originates within or to the east of the Gunshy Ridge subdivision, a subdivision located east of the Property (east of Parcels D and F). Farm ditches 1, 2, and 3 receive surface runoff and groundwater from the farmed portions of Gunshy Manor and discharge this water directly to Evans Creek. The Spur Farm Road Ditch receives water from the Evans Creek Natural Area. In addition to these fish-bearing waters, nine wetlands (Wetlands

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A, B, C, D, E, G, H, I, and K) were also identified and delineated. Wetland B is contiguous with the Evans Creek Natural Area wetlands abutting the south edge of Parcel E.

There is no hydrologic connectivity between the wetland areas on either side of the Loop Farm Road. Wetland B (and by extension, the Evans Creek Natural Area) is not hydrologically connected to the Thompson Hay Field, nor is the Thompson Hay Field hydrologically connected or providing support to Wetland B or any other delineated wetland on Gunshy Manor. All onsite wetlands, except for Wetland C, drain to either Farm Ditch 1 or Farm Ditch 2. Wetland C is connected to Evans Creek via a pump system.

Wetlands were delineated using the methodology outlined in Chapter 5 (Difficult Wetland Situations in the Western Mountains, Valleys, and Coast Region) of the Corps Regional Supplement (2010). This methodology involves a more in-depth analysis of existing site conditions, patterns of vegetation, soil conditions, site hydrology, along with a comparisons of conditions on nearby undisturbed sites. The Evans Creek Natural Area, which is adjacent along the southern and western boundaries of Gunshy Manor, provides an example of how onsite conditions in the westernmost portion of the Site might have looked prior to the onset of farming operations. For the most part, wetlands were determined through demonstration of the presence of wetland hydrology (direct observation of hydrology during the early part of the growing season and shallow groundwater monitoring) and the predominance of hydrophytic vegetation. An extensive hydric soil evaluation was conducted in November 2016 to supplement the previously identified wetland boundaries with a substantial number of wetland datasheets completed to fully document the wetland boundaries.

Soils within all of the farm fields are disturbed to some extent due to the land management activities typically used on most farmed land. This Site and its wetlands are no exception. Additional datasheets were collected in November 2016 to document the established wetland boundaries. No changes were made to the previous datasheets, though where discrepancies occurred, new datasheets were collected within close proximity to attempt to clarify the data. Relict redoximorphic (redox) features were present both within the wetlands and outside of the wetlands. Relict redox features are those redox features that lack diffuse boundaries (by definition relict redox features have sharp boundaries) that represent redox features that no longer reflect active water table movement (hydrology) for a variety of reasons – change in local hydrology, fill material, etc. In addition, soils across the fields in and around the wetlands are consistently a value of 3-4 and a chroma of 1-2 with relatively few exceptions, which means that the requirements for meeting a hydric soil indicator are limited to the presence of active redox features in some layer. The datasheets prepared in November 2016 reflect detailed notes on the soils and why each point was determined the way it was. It's important to note that a number of datasheets within existing wetlands (particularly within Thompson Field) lacked a hydric soil indicator. However, the intent of the November 2016 site evaluation was to document the wetland boundaries as they existed at that point in time, and expand the boundaries as needed, not to adjust boundaries smaller.

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4.2.1 Wetlands

4.2.1.1 Wetland A

Wetland A is a moderately-sized (approximately 8,287 sf, 0.19-acre) emergent wetland located in a topographic depression on the east side of Farm Ditch 2 on Parcel C (**Figure 6**). It is coincidental with the southern end of Farm Ditch 2, which has a base elevation that is not significantly different from the farm ditch's top-of-bank elevation. This wetland was previously described in our 18 May 2012 report (a report prepared in support of then-proposed boundary line adjustments) as being approximately 5,700 sf. The wetland boundary was re-delineated on 19 August 2014 and again on 7 April 2015. The boundary of Wetland A was subsequently surveyed by ESM. We believe that the increase in Wetland A's size is likely the result of substantial differences in the amount of precipitation that occurred prior to each of the three different site visits when wetland delineations were made. Also, the number and durations of rain-free events is likely attributable to these differences as well. Our 2012 delineation of Wetland A was likely influenced by apparent hydrologic conditions that were not normal in an area where the dominant vegetation is facultative and the soils are mapped as hydric. Normal precipitation curves for 2009 through 2012, 2014, and 2015 are presented in **Appendix D**. The boundary for Wetland A was verified on 18 February 2015. No changes were made to this wetland during the November 2016 evaluation, nor were additional datasheets collected. The size of the wetland has not changed, though the value reflected above has decreased slightly due to a correction made while revising the figures on how the wetland boundary abutting Farm Ditch 2 was mapped.

Wetland A has a single plant community type (emergent). Species include field foxtail (*Alopecurus pratensis*), soft rush (*Juncus effusus*), creeping buttercup (*Ranunculus repens*), skunk cabbage (*Lysichiton americanum*), and celery-leafed buttercup (*R. sceleratus*). Soils within the wetland are sandy clay loams, generally black (10YR 2/1), and subtended at approximately 8 inches by a clay hardpan layer. Soils outside of the delineated wetland boundary are sandy clay loams, generally very dark brown (10YR 3/2) to approximately three inches and brown (10YR 5/3) with yellow mottles (10YR 7/8) from three inches to approximately 18 inches. Hydrology within the wetland appeared to be supported, for the most part, by shallow groundwater seepage.

We rated the wetland using the Washington State Wetland Rating System for Western Washington (2008) (**Appendix E**). Wetland A scored 4 points for Water Quality Functions, 4 points for Hydrologic Functions, and 13 points for Habitat Functions. The Total Score for Functions is 21, which satisfies the criteria for characterization as a King County Category IV wetland. Category IV wetlands in King County have a 50-foot standard buffer measured landward from the delineated wetland edge. The wetland buffer is contained within the 165-foot Type F buffer for Farm Ditch 2.

4.2.1.2 Wetland B

Wetland B is an extension of the Evans Creek Natural Area (ECNA) wetland onto Gunshy Manor (**Figure 6**). The onsite portion of Wetland B, based on our 2014 wetland delineation work, was approximately 636,748 sf (14.6 acres) in size. It was later determined that the previously delineated Wetland F is actually part of Wetland B. Therefore, the onsite portion of Wetland B increased in size slightly. Minor adjustments

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to the delineation of Wetland B were made during the November 2016 site visit near Farm Ditch 1 and Wetland E (between flags WL-B47 and WL-B74). The onsite portion of Wetland B, based on the most recent revisions of November 2016, is approximately 639,389 sf (14.7 acres). The offsite portion is greater than 38 acres in size.

Wetland B on the Property is densely vegetated with various pasture grasses, a *Carex* (potentially *Carex stipata*), soft rush (*Juncus effusus*), Pacific bedstraw (*Galium trifidum* var. *pacificum*), American brooklime (*Veronica americana*), and others. The southern portion is vegetated with Pacific willow (*Salix lasiandra*), Sitka willow (*S. sitchensis*), western crabapple (*Malus fusca*), red-osier dogwood (*Cornus alba*), Douglas spirea (*Spiraea douglasii*), western red cedar (*Thuja plicata*), western skunk cabbage (*Lysichiton americanum*), small-fruited bulrush (*Schoenoplectus microcarpus*), and others. Upland vegetation includes dandelion (*Taraxacum officinale*), smooth hawksbeard (*Crepis capillaris*), dovefoot geranium (*Geranium molle*), Carolina geranium (*G. carolinensis*), cleavers (*Galium aparine*), and sow thistle (*Sonchus asper*).

Soil within the farmed portion of Wetland B consists of up to 10 inches of what appeared to be peat (mostly dead grass roots and partially decomposed grass and sedge litter) with very dark grayish brown to dark greenish gray silty clay loam. We later learned from Mr. Nelson that the top ten inches of peat-like soil was created when the pasture was maintained and reconditioned, historically, and again in 2009. Pasture reconditioning involved the cutting, mowing, and mulching the existing vegetation, and incorporating the mulch into the soil using a Harley Rake. Upland soils were generally very dark grayish brown silt loam to very dark greenish gray clay.

A mix of relict and active redoximorphic features were present within the soils both inside and outside of this wetland. The wetland boundary adjustments were made based on the presence of wetland hydrology and active redoximorphic features reflecting current water table movement within the upper foot of the soil within the newly added wetland areas. An additional 10 wetland datasheets were completed in addition to the six previously completed datasheets, for a total of 16 datasheets.

Hydrology for Wetland B is supported, for the most part, by seasonally high water and a shallow groundwater table. Hydrology was confirmed by the presence of saturated soils and a positive reaction to dipyridyl[2].

We rated Wetland B using the Washington State Wetland Rating System for Western Washington (2008) (**Appendix E**). The wetland scored 28 for Water Quality Functions, 12 for Hydrologic Functions, and 31 for Habitat Functions. The Total Score for

[2] α, α dipyridyl is a reagent that reacts to the presence of reduced iron to produce a vivid magenta color. A positive reaction to dipyridyl is an indicator that hydric conditions currently exist within the soil. Care must be used when applying dipyridyl to ensure that the reagent only contacts a freshly-exposed soil pedon. Dipyridyl can react with iron scraped from hand tools by soil grains and give a false positive for the presence of wetland hydrology. Additionally, the lack of a reaction can indicate that all reduced iron has been removed from the soil (depleted matrix soil) or a soil that naturally contains little to no reduced iron.

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Functions was 71, which satisfies the criteria for characterization as a King County Category I wetland. Category I wetlands with a Habitat Function score of 30 or more have a 225-foot standard buffer.

4.2.1.3 Wetland C

Wetland C is a moderately-sized emergent wetland (approximately 8,298 sf, 0.19-acres) located north of an existing access road off of 196th Avenue NE (**Figure 6**). The boundary of Wetland C was verified on 18 February 2015. This wetland contains yard drains and a system of pipes that connect to an electric sump pump. Water was within 14 inches of the top of the yard drains during our August 2014 site evaluation.

Vegetation within Wetland C consists of various pasture grasses, soft rush, Pacific bedstraw, western yellow cress (*Rorippa curvisiliqua*), and American brooklime (*Veronica americana*). Upland vegetation was similar to wetland vegetation, but typically did not have American brooklime, soft rush, or western yellow cress.

Soils within Wetland C consist of dark brown gravelly sandy loam beginning at the surface to approximately 10 inches below ground surface. Between 10 inches to approximately 18 inches below ground surface the soils demonstrate a dark gray with dark yellowish-brown redoximorphic features. Upland soils demonstrated a depleted matrix; however, the areas of those soils with a depleted matrix were not considered part of the wetland due to an absence of hydrologic indicators.

Hydrology is supported, for the most part, by a seasonal shallow groundwater table. Hydrology was confirmed by drainage patterns and topography and supported by positive dipyridyl reactions.

We rated Wetland C using the Washington State Wetland Rating System for Western Washington (2008) (**Appendix E**). It scored 16 for Water Quality Functions, 16 for Hydrologic Functions, and 9 for Habitat Functions. The Total Score for Functions was 41, which satisfies the criteria for characterization as a King County Category III wetland. Category III wetlands with Habitat Scores of less than 20 have a 75-foot standard buffer.

4.2.1.4 Wetland D

Wetland D is a moderately-sized (approximately 44,828 sf, 1.03 acre) wetland located south of the Farm Entrance off Brick Road (196th Avenue NE) and south of Wetland C (**Figure 6**). A small portion of Wetland D is contiguous with Evans Creek. Wetland D has been rated separately from Wetland B based on observed hydrologic differences between these two wetland areas. Field observations show that flow between the two areas is unidirectional and the elevation of high water for Wetland B is approximately 1 to 1½ feet above the elevation of high water for Wetland D, as explained further below.

Section 4.1 of the Wetland Rating System for Western Washington (Hruby 2014) (the "Rating System") provides a framework for determining the boundaries of wetland rating units of contiguous wetlands in valleys (either depressional or riverine). The Rating System states that "[t]he guiding principles for separating a wetland in a valley into

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different units are changes in water regime or a lack of wetland plants. Boundaries between different units should be set at the point where the volume, flow, or velocity of the water changes abruptly." Furthermore, "[t]hese changes in water regime can be either natural or human caused (anthropogenic)." The provided examples of changes in water regime includes "[t]he presence of drainage ditches that significantly reduce water detention in one area of a wetland."

If water is able to flow freely between the different wetland areas, then they should be considered as a single wetland for rating purposes. However, if water movement is unidirectional, downgradient, and has a change in elevation between the wetland areas, then the wetlands should be considered as separate units for rating purposes. In addition, the Rating System states that "[g]enerally, if the high water mark in the lower wetland is 6 in. or more lower than the high water mark in the upper wetland, then the two should be considered as separate units for rating."

At Gunshy Manor, ground water generally flows from the eastern portion of the property westward towards Evans Creek. Some of this ground water is intercepted by the ditches and conveyed directly to Evans Creek. Some hydrology can also be provided by overland flooding from Evans Creek. The general flow of water through Wetlands B and D are illustrated on **Figure 7**.

An important hydrologic factor of how the western portion of Gunshy Manor drains is the existence of the Red Brick Road. This raised roadway, which was built in the early 1900s, limits the natural flow of water to Evans Creek. The Red Brick Road provides no drainage other than the bridge over Evans Creek and none can be constructed now due to the road's placement on the National Historic Registry. Any ground or surface water naturally flowing downgradient towards Evans Creek will be blocked by the raised roadbed, which leads to saturated soil conditions and seasonal ponding during the rainy season. Water collecting against the raised roadbed of the Red Brick Road must flow south (either subsurface or surface flow) to Evans Creek. While it cannot be said that the road and associated fill material created the conditions seen in Wetlands B and D, it is very likely that the road contributed to their development as seen today.

Under normal conditions, groundwater flows through Wetland B in a westerly direction. However, during high water events (i.e., flood conditions on Evans Creek), overland flooding can occur in Wetlands B and D. Flood waters coming from the Evans Creek Natural Area are initially constricted by the Red Brick Road and spills around the Spur Farm Road. After passing by the Spur Farm Road, flood waters can only expand eastward into Wetland B. This water then flows in a generally northwesterly direction towards the Evans Creek Bridge. Any surface water extending northward towards Wetland D is typically intercepted by Farm Ditch 2 and conveyed to Evans Creek near the aforementioned bridge. In very high water events, it is possible for a small volume of flood waters to pass into Wetland D. However, ponded water in Wetland D does not flow back into Wetland B. This is because Wetland D is lower in elevation compared to

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Wetland B and the natural point of discharge for Wetland D is Evans Creek[3]. This unidirectional hydrology satisfies the criteria of separating wetlands by hydrology.

In February 2015, we observed that Wetland B had considerable ponding upslope from the initial 2012 delineation. The wintertime delineation and refinement of Wetland B generally flagged edge of ponding. This represents the high water mark for Wetland B.

Wetland D, however, had significantly less area of ponding than Wetland B. The extent of ponding seen in Wetland D during our February 2015 site work was located entirely within the wetland boundary delineated in 2012 and isolated to the western portion of the wetland. We estimated the high water mark for Wetland D using LiDAR terrain data and our field observances of the extent of ponding during 15 February 2015.

LiDAR data, which was collected in 2012, was obtained from the City of Redmond by ESM. We used this LiDAR data to evaluate the topography of Wetlands B and D. **Figure 8** depicts one-foot LiDAR topography for Wetlands B and D. Topographic elevations of wetted area for Wetland B ranges from 64 ft. (amsl) to 66 ft. (amsl), whereas the topographic elevation of wetted area for Wetland D ranges from 63 ft. (amsl) to 64 ft. (amsl). The elevation difference between the wetted areas of Wetlands B and D are approximately 1 to 1 ½ feet. This satisfies the criteria for separating wetland units by high water elevation for rating purposes.

The topographic elevations for the area of extended ponding for the portion of Wetland B within the Summer Pasture ranges from 64 ft. (amsl) to 66 ft. (amsl). The topographic elevations for Wetland D range from 63 ft. (amsl) to less than 64 ft. (amsl). The elevation difference between wetted area of Wetland B is generally in the range of 1 and 1 ½ feet above the wetted area of Wetland D. This satisfies the criteria for separating the wetlands based on differences in wetted edge elevation.

Vegetation within Wetland D consists of Pacific bedstraw, soft rush, *Carex* sp., and various pasture grasses. Upland vegetation was similar to wetland vegetation, except that *Carex* and soft rush were not as extensive and a marked increase in deep taprooted upland herbs.

Soils within Wetland D consist of very dark brown gravelly silt loam with a high organic content as well as a dark greenish gray clay. A considerable amount of large gravel and small cobble was found within 10 inches of the soil surface. Other test pits within the wetland had soil colors of very dark brown to black with brownish-yellow redoximorphic features. Upland soil consists of very dark grayish brown silt loam to very gravelly sandy loam.

Hydrology is supported, for the most part, by a shallow water table. The presence of wetland hydrology was confirmed, in part, by a positive reaction to dipyridyl. Other indicators included geomorphic position and drainage patterns.

[3] Both Wetlands B and D discharge water to Evans Creek.

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The boundary of Wetland D was expanded slightly during the November 2016 evaluation to the east from its southeast corner along Farm Ditch 2 to reflect an additional area that met the wetland parameters based on a reevaluation of the hydric soils. A swale is present through this area that extends from the pasture to the north through to Farm Ditch 2. Additional datasheets are provided within this swale to document its exclusion from the wetland delineation for Wetland D.

We rated Wetland D using the Washington State Wetland Rating System for Western Washington (2008) (**Appendix E**). Wetland D scored 8 points for Water Quality Functions, 12 points for Hydrologic Functions, and 10 points for Habitat Functions. The Total Score for Functions was 30, which satisfies the criteria for characterization as a King County Category III wetland. Category III wetlands with habitat scores less than 20 have a 75-foot standard buffer.

4.2.1.5 Wetland E

Wetland E is a moderately-sized wetland (approximately 21,688 sf, 0.5-acres) located east of Wetland D between Farm Ditch 2 and an existing farm road (**Figure 6**). A low berm separates Wetland E from Farm Ditch 2. No changes to the wetland boundary were made during the November 2016 evaluation and no additional datasheets were added.

Vegetation within Wetland E consists of Oregon ash (*Fraxinus latifolia*), black cottonwood (*Populus balsamifera* var. *trichocarpa*), and red alder (*Alnus rubra*) trees. The understory consists of Pacific crabapple, red-osier dogwood, black twinberry (*Lonicera involucrata*), and Douglas spirea. Herbs were largely absent throughout most of the wetland. Herbs present include lady fern (*Athyrium filix-femina*) and piggy-back plant (*Tolmea menziesii*).

Soils within Wetland E consist of black silt loam from three to 13 inches of the soil surface. Gravel and cobble were found beginning at eight inches. Other test pits within the wetland had soil colors of very dark gray with very pale brown redoximorphic features. Upland soils consist of dark brown silt loam to very dark grayish brown loam.

Hydrology within Wetland E is supported, for the most part, by a shallow groundwater table. Additional hydrology support may be provided by surface runoff from the fields and existing farm road.

We rated Wetland E using the Washington State Wetland Rating System for Western Washington (2008) (**Appendix E**). Wetland E scored 16 points for Water Quality Functions, 6 points for Hydrologic Functions, and 17 points for Habitat Functions. The Total Score for Functions is 39, which satisfies the criteria for characterization as a King County Category III wetland. Category III wetlands with habitat scores less than 20 have a 75-foot standard buffer. This buffer is fully contained within the buffers of Farm Ditch 1 and Farm Ditch 2.

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4.2.1.6 Wetland G

Wetland G is a moderately sized (approximately 6,809 sf, 0.16-acres) long, narrow strip of wetland associated with the east bank of Farm Ditch 1 (**Figure 6**). No revisions to the Wetland G boundary were made during the November 2016 evaluations, and no additional datasheets were added.

The wetland slopes gently downward towards the top-of-bank of Farm Ditch 1, at which point the topography becomes nearly vertical down to the bottom of the ditch. The vegetation within Wetland G includes various pasture grasses, sedges (*Carex* spp.), and soft rush. A few trees are located in the northern end of the wetland. Tree species include western red cedar and red alder. This wetland is regularly mowed as part of ongoing farming activities. The Cowardin classification of this wetland is palustrine emergent with a forested class that is saturated only.

Soil within Wetland G are generally similar to Wetland A (See **Section 4.2.1.1**) with black clay loam soil in the upper 12 inches. Upland soils were generally very dark grayish brown silt loam.

Since Wetland G is separated from the ECNA by a ditch (Farm Ditch 1) and a berm, it was deemed important to definitively identify where Wetland G receives its hydrology. If Wetland G receives hydrologic support from the ECNA, then it would be considered a part of the ECNA wetland with a standard Category I wetland buffer. In contrast, if Wetland G is predominantly supported hydrologically by shallow groundwater from the sloped farm fields to the east, then Wetland G is a separate wetland.

On 2 February 2016, we set up a Leica rotary laser level on the berm that separates the ECNA from Farm Ditch 1 and Wetland G. The purpose of this work was to determine the elevation of water surface levels within Farm Ditch 1 and the surface level of the ponded water within the ECNA relative to the height of the instrument. The surface water level of Farm Ditch 1 was measured at 10.6 feet below the instrument's beam. The surface water level of the ponded area within the ECNA was 6.19 feet below the instrument's beam. The difference of water elevation between the ECNA and Farm Ditch 1 was 4.41 feet (i.e., the surface water elevation within Farm Ditch 1 was 4.41 feet lower than the surface water elevation within the ECNA). This demonstrates that the ECNA is not providing hydrologic support to Wetland G and that the two areas should be considered separate wetlands for rating purposes. Hydrology within Wetland G is, therefore, supported by shallow groundwater levels from the sloped fields to the east. Water generally flows out of this wetland and into Farm Ditch 1 unimpeded.

We rated Wetland G using the Washington State Wetland Rating System for Western Washington (2008) (**Appendix E**). Wetland G scored 3 points for Water Quality Functions, 4 points for Hydrologic Functions, and 15 points for Habitat Functions. The Total Score for Functions is 22, which satisfies the criteria for characterization as a King County Category IV wetland. Category IV wetlands have a 50-foot standard buffer. This buffer is fully contained within the buffer of Farm Ditch 1.

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4.2.1.7 Wetland H[4]

Wetland H is a palustrine emergent wetland located on the north side of the Thompson Hay Field (**Figure 6**). The size of this wetland is approximately 73,436 sf (1.66 ac). Wetland H is currently managed for hay production and is regularly mowed as a part of ongoing farming activities. Vegetation includes various pasture grasses, meadow foxtail (*Alopecurus pratensis*) and soft rush. Upland vegetation generally lacked soft rush and meadow foxtail. One very minor adjustment was made during the November 2016 site evaluation to this wetland boundary in the northeast corner where several flags were deleted to create a slightly larger wetland near where Wetland K is located. Additional datasheets were collected in and around Wetland H.

Within the Thompson Hay Field (in which Wetland H resides), soil color and texture were consistent between Wetlands H, I, and K, as well as the upland areas of Thompson Hay Field. Soil color within the wetland were generally gray with brownish-yellow redoximorphic features.

Hydrology for Wetland H is supported by a shallow seasonal groundwater table. Water in Wetland H generally flows unimpeded to Farm Ditch 2 via an existing network of drain tiles and field drains.

We rated Wetland H using the Washington State Wetland Rating System for Western Washington (2008) (**Appendix E**). Wetland H scored 3 points for Water Quality Functions, 4 points for Hydrologic Functions, and 11 Points for Habitat Functions. The Total Score for Functions is 18 which satisfies the criteria for characterization as a King County Category IV wetland. Category IV wetlands have a 50-foot standard buffer.

4.2.1.8 Wetland I

Wetland I is a small depressional wetland within Thompson Hay Field (**Figure 6**). It is located southwest of Wetland H. The size of Wetland I is approximately 18,000 sf (0.4-ac). Vegetation and soil conditions within Wetland I are similar to Wetland H. However, Wetland I resides in a slight topographic low area. Therefore, it was rated as a depressional wetland with no visible aboveground outlet. No changes were made to this wetland boundary during the November 2016 site evaluation, though additional datasheets were collected in and around Wetland I.

Hydrology for Wetland I is supported by a shallow seasonal groundwater table. Water in Wetland I generally flows unimpeded to Farm Ditch 2 via an existing network of drain tiles and field drains.

We rated Wetland I using the Washington State Wetland Rating System for Western Washington (2008) (**Appendix E**). Wetland I scored 3 points for Water Quality Functions, 14 points for Hydrologic Functions, and 10 points for Habitat Functions. The

[4] Wetland F, which was identified in the previous Critical Areas Report (2014), was later determined to be part of Wetland B. Accordingly, Wetland F is no longer separately identified.

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Total Score for Functions is 27, which satisfies the criteria for characterization as a King County Category IV wetland. Category IV wetlands have a 50-foot standard buffer.

4.2.1.9 Wetland K[5]

Wetland K is a small depressional wetland with Thompson Hay Field (**Figure 6**). It is located east of Wetland I and south of Wetland H. The size of Wetland K is approximately 43,227 sf (0.99-acres). Wetland K also resides within a slight topographic low area with no visible aboveground outlet. Therefore, it was rated as a depressional wetland. The boundary of Wetland K was expanded during the November 2016 site evaluation with additional datasheets collected to thoroughly document the current conditions both within and around this wetland.

Hydrology for Wetland K is supported by a shallow seasonal groundwater table. Water in Wetland K generally flows unimpeded to Farm Ditch 1 via a network of existing drain tiles and field drains.

We rated Wetland K using the Washington State Wetland Rating System for Western Washington (2008) (**Appendix E**). Wetland K scored 3 points for Water Quality Functions, 14 points for Hydrologic Functions, and 11 points for Habitat Functions. The Total Score for Functions is 28 points, which satisfies the criteria for characterization as a King County Category IV wetland. Category IV wetlands have a 50-foot standard buffer.

4.2.2 Streams and Farm Ditches

All the streams and farm ditches associated with Gunshy Manor are located in a basin indicated as “high” on the King County Basin and Shoreline Conditions Map (King County, 24 September 2004). All fish-bearing waters have buffers consistent with KCC 21A.24.358(B)(2).

4.2.2.1 Evans Creek

Evans Creek is a fish-bearing stream that flows onto the southwestern portion of the Property adjacent to 196th Avenue NE (**Figure 6**). Evans Creek leaves the site at approximately the center of the western property boundary adjacent to 196th Avenue NE under a bridge. The reach of Evans Creek on the Property is approximately 10- to 25-feet wide at the wetted width. The stream bed consists of gravel and sand. Some emergent vegetation, consisting predominantly of narrow-leaf burr-reed (*Sparganium angustifolium*), grows within the stream. Woody vegetation cover is close to 75-percent within the Evans Creek Natural Area, but is mostly non-existent for the reach of Evans Creek that is adjacent to the farmed portion of Gunshy Manor.

Evans Creek is known to support runs of anadromous fish, including Puget Sound Chinook (*Oncorhynchus tshawytscha*), coho (*O. kisutch*), sockeye (*O. nerka*), steelhead (*O. mykiss*), and coastal cutthroat trout (*O. clarki*).

[5] The letter “J” was skipped when naming wetlands in the field.

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Evans Creek is a King County Type F stream (fish-bearing) and has a 165-foot standard buffer measured landward from the ordinary high water mark (OHWM).

4.2.2.2 Martin Creek

Martin Creek is a tributary to Evans Creek that crosses the Property in one location, at the extreme north end of the Property (**Figure 6**). Martin Creek flows from northeast to southwest under the Gunshy Manor entrance driveway off of Union Hill Road. Martin Creek's headwaters are located east of 208th Avenue NE, approximately 3,800 feet to the east and offsite. Martin Creek is a King County Type F stream and has a 165-foot standard buffer measured landward from the OHWM.

4.2.2.3 Stream 1

The headwaters of Stream 1 are located east of Parcels D and F, within or to the east of an existing adjacent single-family residential subdivision development to the east known as Gunshy Ridge (**Figure 2**). A stormwater facility for Gunshy Ridge supplies some of the hydrology of this stream. An offsite Gunshy Ridge stormwater outfall structure (an outfall structure that is part of the onsite Gunshy Ridge stormwater facility) is located within an easement on Parcel F. Stream 1 drains an area east of 208th Avenue NE between NE 71st Street and NE 63rd Street within the Gunshy Ridge subdivision and flows generally in a westerly direction across the Evans Creek Natural Area (ECNA) wetland. Stream 1 eventually flows into Evans Creek within the ECNA.

The width of Stream 1 ranges between approximately 3 and 5 feet. The substrate consists mainly of gravel to coarse sand. The upper reach (offsite to the east of the subject property) of the streambank is well vegetated with native trees and shrubs. Trees along the Stream 1 corridor form a relatively continuous canopy and provide an adequate degree of shading.

This stream is currently rated as a King County Type F stream. The standard buffer for a King County Type F stream is 165 feet measured landward from the OHWM.

4.2.2.4 Farm Ditch 1

Farm Ditch 1 is an artificial drainage constructed along portions of the west boundary of Parcels D and F and extending generally west through approximately the middle of Parcel E (**Figure 6**). Farm Ditch 1 starts approximately 50 feet north of Stream 1 and approximately 200 feet west of the intersection of the Loop Farm Road and the Main Farm Road (**Figure 6**). From its starting point, Farm Ditch 1 extends generally northward for approximately 666 feet, then extends westward for approximately 630 feet, at which point it passes through a culvert under the Spur Farm Road before extending to the northwest for approximately 485 feet. A lateral swale, which stems from part of the east edge of the northwesterly portion of Wetland B, drains to the east-northeast through the Summer Pasture area and connects into approximately the middle of that 485-foot segment of Farm Ditch 1. Farm Ditch 1 connects with Farm Ditch 2, which then extends generally westward for approximately 332 feet, eventually flowing into Evans Creek. The wetted width of Farm Ditch 1 ranges between 10 and 15 feet. The substrate consists of fine silts and muck. The bed is vegetated in parts with narrow-leaved burr-reed (*Sparganium angustifolium*) and pondweed (*Potemogeton*

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natans). **Farm Ditch 1 is not connected to, nor does it receive any water from Stream 1**. Hydrology for Farm Ditch 1 is supported by input from an existing network of field drain tiles and seasonal high groundwater levels.

There are no natural barriers to fish migration from Evans Creek into Farm Ditch 2 and, by extension, into Farm Ditch 1. Therefore, Farm Ditch 1 is currently rated as a King County Type F water with a 165-foot standard buffer measured landward from the OHWM.

4.2.2.5 Farm Ditch 2

Farm Ditch 2 is an artificial drainage that in part extends along more than half of the east boundary of Parcel E (see **Figure 6**). It starts west of the northwest corner of Parcel D and extends northward for approximately 718 feet. That upper portion of Farm Ditch 2 is not connected with nor receives any water from Farm Ditch 1, the nearest portion of which is located approximately 43 feet to the south of Far m Ditch 2's upper end. A culvert allowing access from the 1st Lower Turnout Pasture to the Thompson Hay Field is located approximately 660 feet from the upper end of Farm Ditch 2. A short distance north of that culvert, this farm ditch then flows generally in a westerly and then southwesterly direction for approximately 1,200 feet, at which point Farm Ditch 1 flows into it. Farm Ditch 2 then flows in a westerly direction for an additional approximately 332 feet to Evans Creek. Hydrology for Farm Ditch 2 is supported by input from an existing network of field drain tiles, seasonal high groundwater levels, and occasional controlled release from a spring located along the Property's eastern boundary for irrigation or livestock purposes.

There are no natural barriers to fish migration from Evans Creek into Farm Ditch 2. Therefore, Farm Ditch 2 is currently rated as a King County Type F water with a 165-foot standard buffer measured landward from the OHWM.

4.2.2.6 Farm Ditch 3

Farm Ditch 3 is located along the northern property boundary of Parcel E, starting at the parcel's northeast corner (**Figure 6**). Farm Ditch 3 receives water from the pond that was constructed on the Property's primary residence (on what is now depicted as Parcel A) in 1942. The pond is fed by a 2-inch diameter pipe from Martin Creek and by a 2-inch diameter pipe from a spring located near the eastern boundary of Parcel B. This pond currently supplies water for irrigation and fire protection purposes. That same spring supplies water for the main residence, the log cabin, the guest house, the barn, corrals and livestock, and for irrigation purposes. Farm Ditch 3 lies adjacent to the northern boundary of Parcel E for approximately 288 feet and is then piped under the Farm Entrance off Brick Road to connect to Farm Ditch 2, which, in turn, flows generally west toward Evans Creek as described above.

Farm Ditch 3 has no natural obstructions to fish passage from Farm Ditch 2 and no natural obstructions throughout its length. It is rated, therefore, as a King County Type F water with a 165-foot standard buffer measured landward from the OHWM.

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4.2.2.7 Spur Farm Road Ditch

The Spur Farm Road Ditch is located along the south side of the Spur Farm Road (**Figure 6**). The Spur Farm Road Ditch receives water from the offsite portion of Wetland B (the Evans Creek Natural Area) and conveys it to Evans Creek. The Spur Farm Road Ditch has no natural obstructions to fish passage from Evans Creek. It is rated as a King County Type F water with a 165-foot standard buffer measured landward from the OHWM.

Chapter 5. MITIGATION PLAN

5.1 Mitigation Design Elements

The following mitigation elements have been discussed with all involved agency staff through a series of communications and meetings with the project team, and are presented below in their current form. **Table 3** lists the mitigation elements by agency, with a discussion of each element following. Details of each mitigation element, including discussions of where exactly the work is proposed, how the work will be completed, and the subsequent monitoring plans are provided in **Appendix F**, the Final Restoration and Mitigation Work Plan.

Table 3. Summary of Mitigation Elements.

Mitigation Element	EPA and DOE	King County
South Farm Ditch (Farm Ditch 1)	X	X
Spur Farm Road	X	X
Loop Farm Road	X	X
Burn Pile Farm Road	X	X
Supplemental Plantings	X	

5.1.1 South Farm Ditch (Farm Ditch 1) Meander (EPA/DOE/King County)

A small segment of Farm Ditch 1, otherwise known as the South Farm Ditch, will be realigned to restore a previous meander of this ditch that was removed during agricultural maintenance activities in years past. The proposed realignment will occur between Wetlands B and E. See the Gunshy Manor Farm plans, **Appendix A**, and the Final Restoration & Mitigation Work Plan, **Appendix F** for details on the proposed construction steps as well as the post-construction monitoring and maintenance plans. Appropriate erosion and sediment control measures will be implemented during the construction phase, and any exposed soil areas after construction work is complete will be hydroseeded to quickly establish herbaceous plant cover to minimize erosion concerns. Timing of work within this ditch will be addressed to avoid potential impacts

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to salmonids. Performance monitoring of this mitigation element will be included within the King County financial guarantee.

5.1.2 Spur Farm Road (EPA/DOE/King County)

Portions of the Spur Farm Road will be lowered by excavating and removing gravel and dirt to the proposed finished grade (see the Gunshy Manor Farm plans, **Appendix A**, and the Final Restoration & Mitigation Work Plan, **Appendix F**). The discussion for the Spur Farm Road, Loop Farm Road, and Burn Pile Farm Road are condensed into a single section within the Final Restoration & Mitigation Work Plan. Appropriate erosion and sediment control measures will be implemented during the construction phase, and any exposed soil areas after construction work is complete will be hydroseeded to quickly establish herbaceous plant cover to minimize erosion concerns. Performance monitoring of this mitigation element will be included within the King County financial guarantee.

5.1.3 Loop Farm Road (EPA/DOE/King County)

Portions of the Loop Farm Road will be lowered by excavating and removing gravel and dirt to the proposed finished grade (see the Gunshy Manor Farm plans, **Appendix A**, and the Final Restoration & Mitigation Work Plan, **Appendix F**). The discussion for the Spur Farm Road, Loop Farm Road, and Burn Pile Farm Road are condensed into a single section within the Final Restoration & Mitigation Work Plan. Appropriate erosion and sediment control measures will be implemented during the construction phase, and any exposed soil areas after construction work is complete will be hydroseeded to quickly establish herbaceous plant cover to minimize erosion concerns. Performance monitoring of this mitigation element will be included within the King County financial guarantee.

5.1.4 Burn Pile Farm Road (EPA/DOE/King County)

Portions of the Burn Pile Farm Road will be lowered by excavating and removing gravel and dirt to the proposed finished grade (see the Gunshy Manor Farm plans, **Appendix A**, and the Final Restoration & Mitigation Work Plan, **Appendix F**). The discussion for the Spur Farm Road, Loop Farm Road, and Burn Pile Farm Road are condensed into a single section within the Final Restoration & Mitigation Work Plan. Appropriate erosion and sediment control measures will be implemented during the construction phase, and any exposed soil areas after construction work is complete will be hydroseeded to quickly establish herbaceous plant cover to minimize erosion concerns. Performance monitoring of this mitigation element will be included within the King County financial guarantee.

5.1.5 Supplemental Plantings

Supplemental plantings of native woody trees and shrubs will be provided adjacent to portions of each of the following: Farm Ditch 1, Farm Ditch 2, Evans Creek (within Wetland B), and Wetland E. Details of the locations of these plantings, proposed species, and planting specifications are provided in **Appendix G**. Details about the installations of these plantings as well as the performance objectives proposed for monitoring are outlined within **Appendix F**. These supplemental plantings are provided

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to satisfy a requirement of the EPA only, and will not be included within the King County financial guarantee.

5.2 Mitigation Construction and Monitoring Elements

5.2.1 Temporary Irrigation System

A temporary irrigation system will be installed where necessary, as appropriate.

5.2.2 Construction BMPs

The proposed project will implement best management practices (BMPs) during construction to minimize impacts to the onsite critical areas during the construction process. The proposed mitigation elements will comply with all applicable construction site erosion control and stormwater BMPs. The details of the construction components of these proposed mitigation elements are provided in **Appendix A** with additional details on the construction sequence provided within **Appendix F**. Stormwater and erosion control BMPs to be implemented for the proposed project may include, but are not limited to:

- Site runoff containment;
- Silt fences;
- Straw bale dams;
- Rock check dams;
- Erosion control mesh, netting, seeding, or other cover for exposed soils;
- Rocked road entries; and covered, seeded, or otherwise stabilized soil stockpiles.

5.2.3 Performance Monitoring and Maintenance

Performance monitoring will occur on the schedule outlined in the attached Final Restoration & Mitigation Work Plan (**Appendix F**), with reports provided to agencies on the schedule provided. One report will be prepared for all mitigation elements and provided to all agencies involved for simplicity sake regardless of which agencies each specific mitigation element is being provided. Methods for monitoring the performance objectives for each mitigation element is detailed within **Appendix F**. Maintenance reviews will be conducted in conjunction with performance monitoring. Following maintenance reviews by the biologist or ecologist, required maintenance on the site will be implemented within 30 business days of submission of a maintenance memo to the maintenance contractor and permittee. Maintenance issues will be noted within the provided performance monitoring reports.

The following list includes examples of maintenance actions that may be implemented during the course of the monitoring period. This list is not intended to be exhaustive, and other maintenance actions may be implemented as deemed necessary.

- During year one, replace all dead woody plant material.
- Remove/control weedy or exotic invasive plants (e.g., Himalayan blackberry, purple loosestrife, Japanese knotweed, etc.) by manual or chemical means approved by permitting agencies. Use of herbicides or pesticides within the mitigation area would only be implemented if other measures failed or were

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considered unlikely to be successful, and would require prior agency approval. All non-native vegetation must be removed and disposed of off-site.

- Weed all trees and shrubs to the dripline and provide 3-inch deep mulch rings 24 inches in diameter for shrubs and 36 inches in diameter for trees.
- Remove trash and other debris from the mitigation areas twice a year.
- Selectively prune woody plants at the direction of Talasaea Consultants to meet the mitigation plan's goal and objectives (e.g., thinning and removal of dead or diseased portions of trees/shrubs).

5.2.4 Contingency Measures

Established performance standards for the project will be compared to the yearly monitoring results to judge the success of the mitigation. If, during the course of the monitoring period, there appears to be a significant problem with achieving the performance standards, the permittee shall work with the appropriate Agency staff to develop a Contingency Plan in order to get the project back into compliance with the performance standards. Contingency plans can include, but are not limited to, the following actions: additional plant installation, erosion control, modifications to hydrology, minor grading, soil amendments, irrigation, and plant substitutions of species, size, quantity, and/or location. Any required contingency plan shall be prepared and submitted to the County according to the requirements of KCC 21A.24.130, and any other applicable code provisions or County requirements, as appropriate, or will be prepared according to the requirements of the EPA, as appropriate.

5.2.5 Financial Guarantee

A financial guarantee will be provided by the Applicant pursuant to the requirements of KCC 21A.24.140 and KCC Title 27A.20 for those mitigation elements provided to King County. The financial guarantee shall be of a type and amount acceptable to King County (bond, assignment of funds, or similar). The financial guarantee shall cover the costs of mitigation construction along with monitoring and maintenance per the monitoring and maintenance schedule included herein. The mitigation elements not provided to King County will be excluded from the prepared financial guarantee.

Chapter 6. REPORT'S INTENDED USE

This report is intended to accompany both an application for a King County Grading Restoration Permit regarding King County Code Enforcement File # ENFR14-0512 and an application for a Critical Areas Designation for review by the King County Department of Permitting and Environmental Review (DPER). This report is also intended for the Client's submission to the Washington Department of Ecology and the U.S. Environmental Protection Agency.

Chapter 7. SUMMARY

Nine wetlands, three streams, and four farm ditches were identified and delineated on the Property. The wetlands were delineated using the atypical methodology for difficult wetland situations as described in Chapter 5 of the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast*

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Region (2010), and rated using the *Washington State Wetlands Rating System for Western Washington* (rev 2008). The streams and farm ditches were determined to be either fish-bearing or having potential fish habitat as defined under WAC 222-16-031 (Interim water typing system). Buffers to wetlands and streams were determined using King County Code 21A.24.325. The wetland areas separated by the Farm Loop Road do not support each other hydrologically.

Mitigation elements were agreed upon by all parties involved, including the EPA, DOE, King County, and the Applicant. Five (5) mitigation elements are proposed for the EPA and DOE, including the Farm Ditch 1 meander, the farm road regrading (Spur Farm Road, Loop Farm Road, and Burn Pile Farm Road), and supplemental plantings. Of these mitigation elements, all but the supplemental plantings are also provided to King County. Performance monitoring for all elements will be address consistent with the attached Final Restoration & Mitigation Work Plan (**Appendix F**) with a single report prepared by the detailed schedule that is to be provided to all agencies involved. Additional details on the mitigation plan for long term monitoring and maintenance is also outlined within **Appendix F**. A financial guarantee will be provided to King County covering those mitigation elements required by King County, which is all except the supplemental plantings.

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Chapter 8. REFERENCES

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Figures

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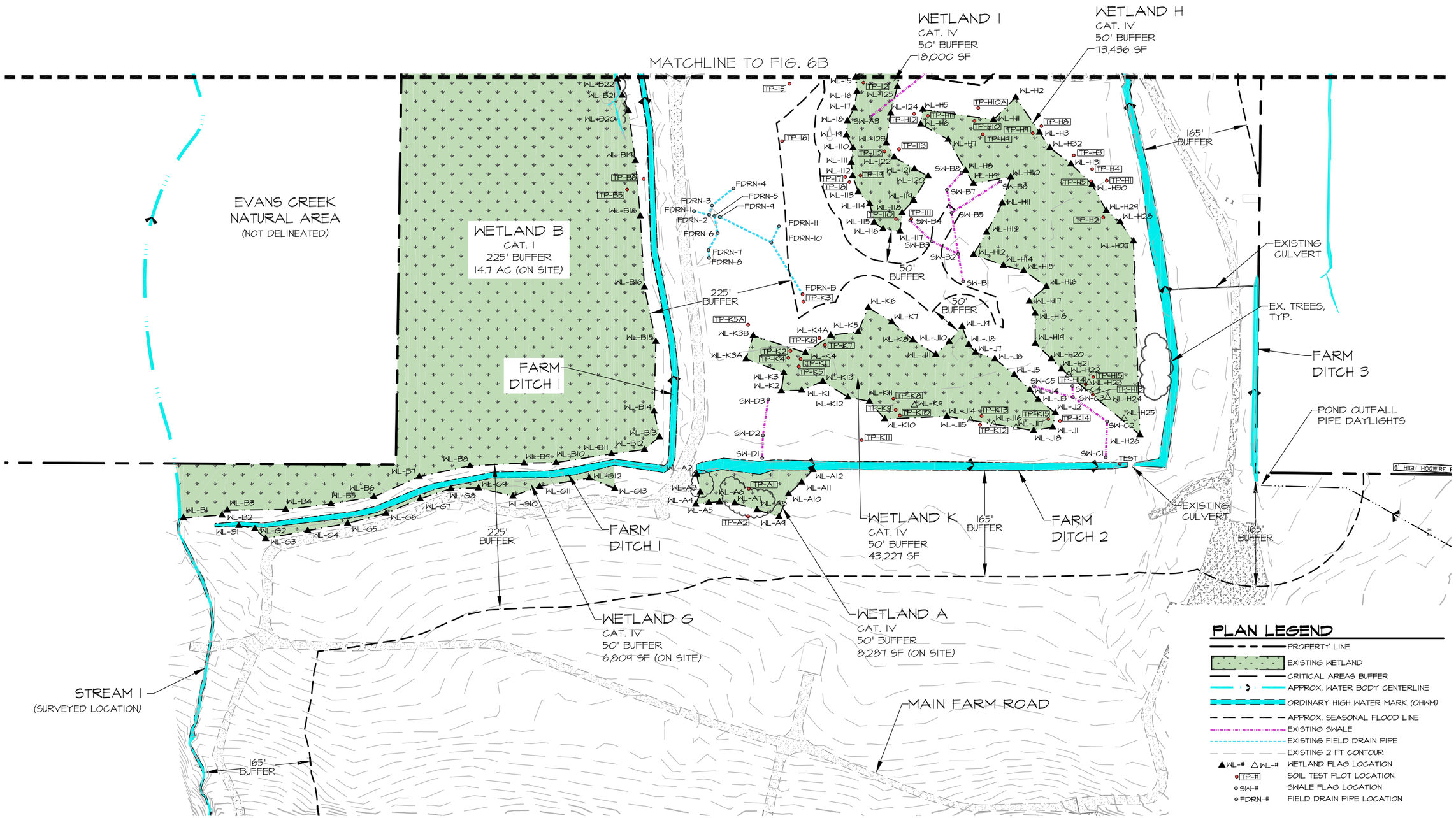

GRAPHIC SCALE
(IN FEET)

0 75 150 300

SCALE: 1"=150'

NORTH

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FIGURE #6b

CRITICAL AREAS MAP, EAST, WEST
GUNSHY MANOR
REDMOND, WASHINGTON

DESIGN	DRAWN	PROJECT
BS	MW	1147

SCALE
NTS

DATE
12-1-2014

REVISED
01-04-2017

6b

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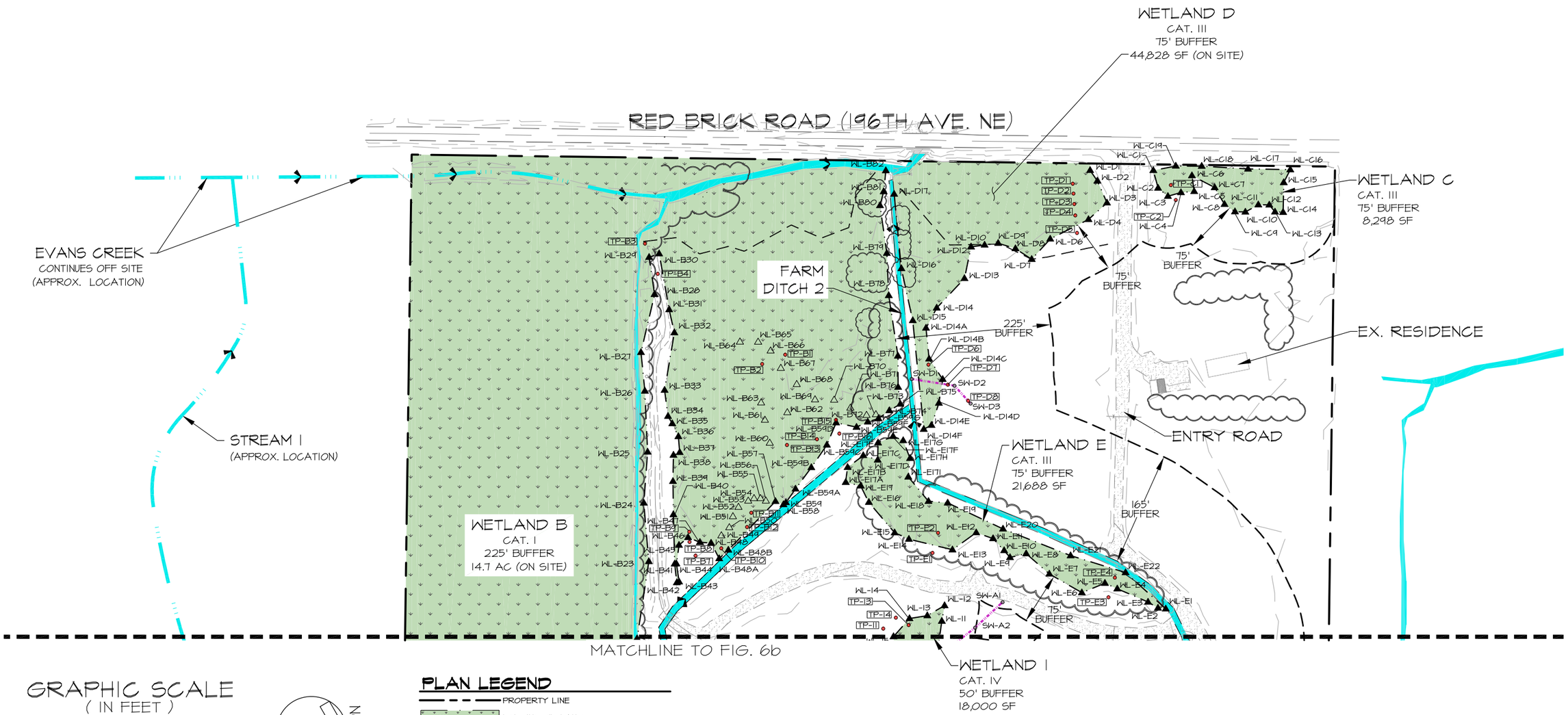

GRAPHIC SCALE
(IN FEET)

0 75 150 300

SCALE: 1"=150'

NORTH

PLAN LEGEND

- PROPERTY LINE
- EXISTING WETLAND
- CRITICAL AREAS BUFFER
- APPROX. WATER BODY CENTERLINE
- ORDINARY HIGH WATER MARK (OHWM)
- APPROX. SEASONAL FLOOD LINE
- EXISTING SWALE
- EXISTING FIELD DRAIN PIPE
- EXISTING 2 FT CONTOUR
- ▲WL-# △WL-# WETLAND FLAG LOCATION
- TP-# SOIL TEST PLOT LOCATION
- SW-# SWALE FLAG LOCATION
- FDRN-# FIELD DRAIN PIPE LOCATION

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FIGURE #6a

CRITICAL AREAS MAP, EAST, WEST
GUNSHY MANOR
REDMOND, WASHINGTON

DESIGN	DRAWN	PROJECT
BS	MW	1147

SCALE: NTS
DATE: 12-1-2014
REVISED: 01-04-2017

6a

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SOURCE: GOOGLE MAPS; WWW.GOOGLE.COM/MAPS (ACCESSED 10-27-2014)

DRIVING DIRECTIONS:

1) FROM SEATTLE TAKE I-90 TO BELLEVUE
2) TAKE EXIT 11B FROM I-90E
3) TAKE WA-520E TO REDMOND
4) AT THE NEXT TRAFFIC SIGNAL, TURN RIGHT ONTO NE UNION HILL ROAD
5) AT THE TRAFFIC CIRCLE, CONTINUE ONTO ONTO NE UNION HILL ROAD
6) ARRIVE AT DESTINATION ON THE RIGHT:
   20005 NE UNION HILL RD
   REDMOND, WA 98053

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FIGURE #1

VICINITY MAP & DRIVING DIRECTIONS
GUNSHY MANOR
REDMOND, WASHINGTON

DESIGN	DRAWN	PROJECT
BS	ABS	1147
SCALE		
NTS		
DATE		
12-1-2014		
REVISED		
5-22-2015		

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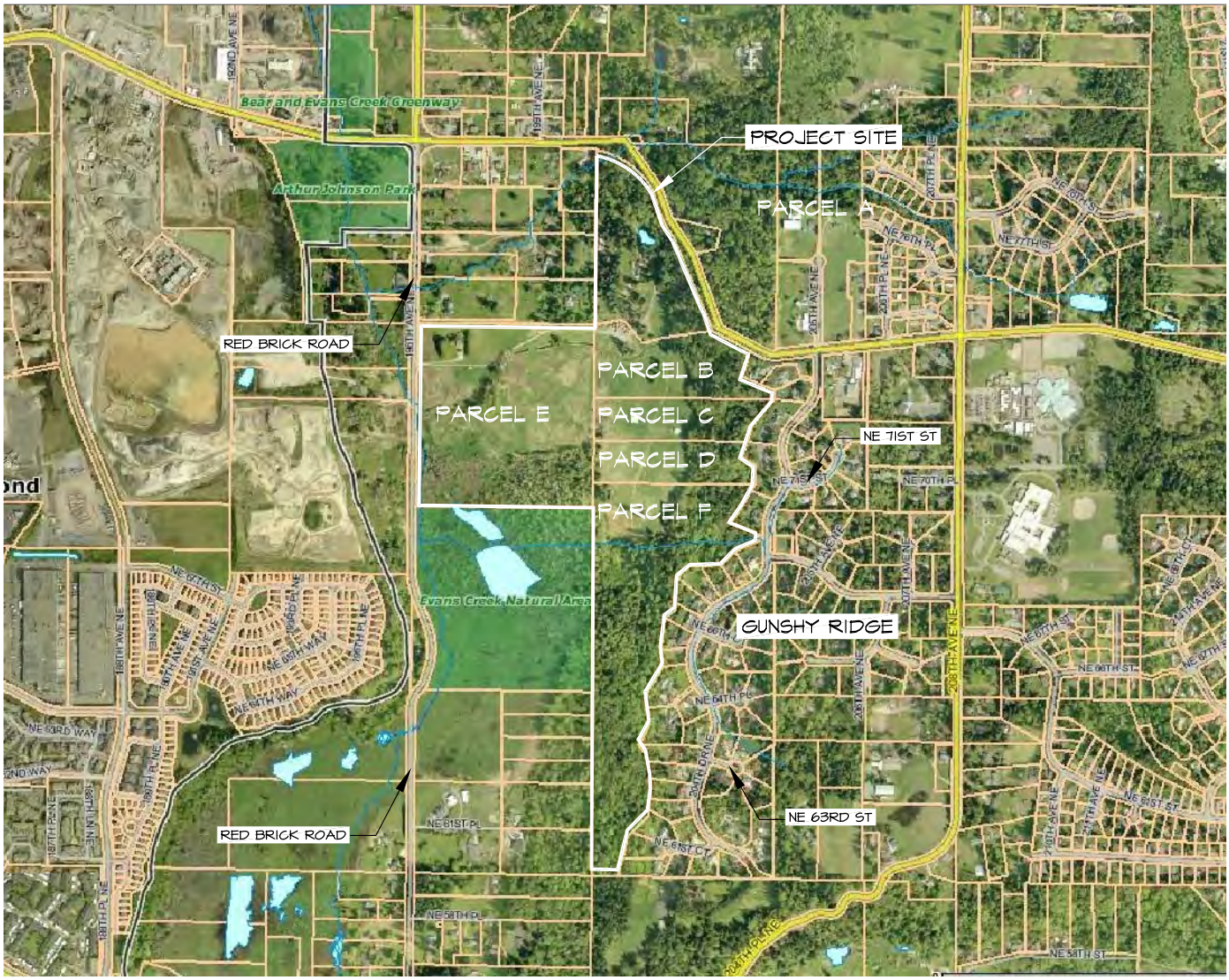

SOURCE: KING COUNTY IMAP;
Http://www5.kingcounty.gov/iMAP/viewer.htm?mapset=kcproperty (ACCESSED 10-28-2014)

PARCEL A - 0825069013

PARCEL B - 0825069103

PARCEL C - 0825069104

PARCEL D - 0825069105

PARCEL E - 0825069012

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FIGURE #2

SITE MAP
GUNSHY MANOR
REDMOND, WASHINGTON

DESIGN	DRAWN	PROJECT
BS	ABS	1147
SCALE NTS		
DATE 12-1-2014		2
REVISED 5-22-2015		

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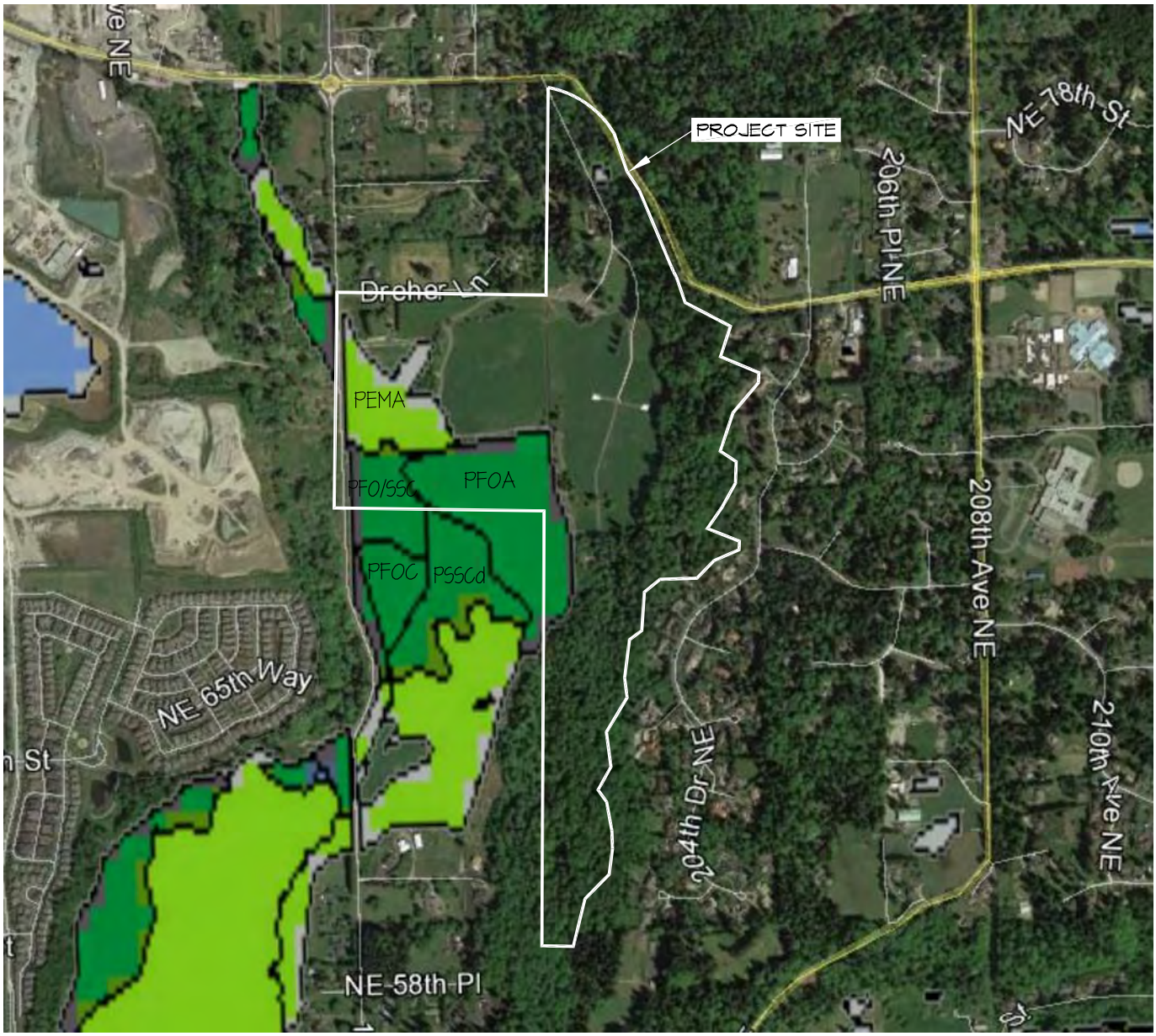

LEGEND

TYPE	DESCRIPTION
PEMA	PALUSTRINE EMERGENT, TEMPORARILY FLOODED
PFOA	PALUSTRINE FORESTED, TEMPORARILY FLOODED
PFO/SSC	PALUSTRINE FORESTED/SCRUB-SHRUB, SEASONALLY FLOODED

SOURCE: U.S. FISH AND WILDLIFE SERVICE, (2014). NATIONAL WETLANDS INVENTORY WEBSITE, U.S. DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE, WASHINGTON D.C. http://www.fws.gov/wetlands/

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FIGURE #3

NATIONAL WETLANDS INVENTORY MAP
GUNSHY MANOR
REDMOND, WASHINGTON

DESIGN	DRAWN	PROJECT
BS	ABS	1147
SCALE NTS		
DATE 12-1-2014		3
REVISED 5-22-2015		

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LEGEND

TYPE	DESCRIPTION, SLOPES
EvB	EVERETT GRAVELLY SANDY LOAM, 0 TO 5 PERCENT SLOPES
InA	INDIANOLA LOAMY FINE SAND, 0-4 PERCENT SLOPES
No	NORMA SANDY LOAM, 0 PERCENT SLOPES
SK	SEATTLE MUCK, 0 PERCENT SLOPES
EvC	EVERETT GRAVELLY SANDY LOAM, 5 TO 15 PERCENT SLOPES
AkF	ALDERWOOD AND KITSAP SOILS, VERY STEEP
AgC	ALDERWOOD GRAVELLY SANDY LOAM, 6 TO 15 PERCENT SLOPES

NORTH

SOURCE: SOIL SURVEY STAFF, NATURAL RESOURCES CONSERVATION SERVICE, UNITED STATES DEPARTMENT OF AGRICULTURE, WEB SOIL SURVEY. AVAILABLE ONLINE AT http://websoilsurvey.nrcs.usda.gov/. ACCESSED (10-28-2014).

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FIGURE #4

NRCS SOILS MAP
GUNSHY MANOR
REDMOND, WASHINGTON

DESIGN	DRAWN	PROJECT
BS	ABS	1147
SCALE NTS		
DATE 12-1-2014		4
REVISED 5-22-2015		

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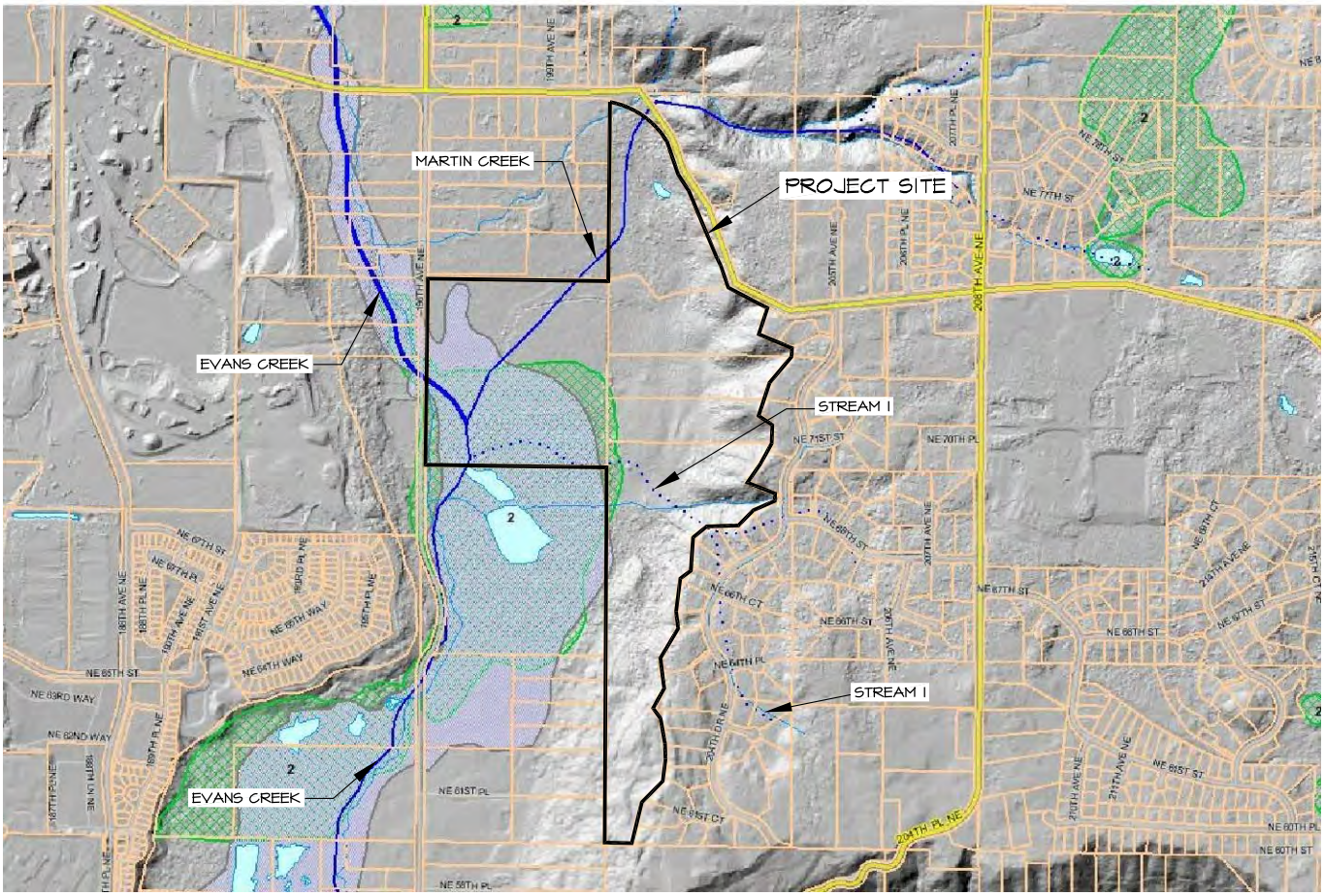

SOURCE: KING COUNTY IMAP - SENSITIVE AREAS; http://www5.kingcounty.gov/iMAP/viewer.htm?mapset=hazards (ACCESSED 10-28-2014)

LEGEND

- SAO Stream
- Class 1
- Class 2 Perennial
- Class 2 Salmonid
- Class 3
- Unclassified
- Lakes and Large Rivers
- Streams
- 100 Year Floodplain
- Channel Migration Hazard Areas
- MODERATE
- SEVERE
- SAO Wetland

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FIGURE #5

KING COUNTY CRITICAL AREAS MAP
GUNSHY MANOR
REDMOND, WASHINGTON

DESIGN	DRAWN	PROJECT
BS	ABS	1147
SCALE NTS		
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REVISED 5-22-2015		

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FIGURE #6

CRITICAL AREA LOCATIONS MAP
GUNSHY MANOR
REDMOND, WASHINGTON

DESIGN	DRAWN	PROJECT
BS	ABS	1147

SCALE: NTS
DATE: 12-1-2014
REVISED: 3-28-2016
6

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Appendix A

Gunshy Manor Farm Exhibit

(as prepared by ESM)

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GUNSHY MANOR FARM EXHIBIT

COLOR AERIAL PHOTO: KING COUNTY, 2011

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Federal Way, WA 98003

REVISIONS

NO.	DESCRIPTION/DATE	BY

ESM CONSULTING ENGINEERS LLC
33400 8th Ave S, Suite 205
Federal Way, WA 98003
FEDERAL WAY (253) 838-6113
EVERETT (425) 297-9900
www.esmcivil.com
Civil Engineering Public Works | Land Surveying Project Management | Land Planning Landscape Architecture

ESTATE OF BARBARA J. NESLON

GUNSHY MANOR

GUNSHY MANOR FARM EXHIBIT

KING COUNTY WASHINGTON

JOB NO.:	1359-001-007
DWG. NAME:	MC-PL-30-KC
DESIGNED BY:	EGL
DRAWN BY:	JJH
CHECKED BY:	
DATE:	10/15/2014
DATE OF PRINT:	

1 OF 1 SHEETS

File: \\Esm8\engr\ESM-JOBS\1359\001\007\exhibits\MC-PL-30-KC.dwg
Plotted: K:\library\borders\2005\B-24x36.dwg Plotted By: Patrick Danner

Appendix B

Problematic Hydrophytic Vegetation

(from the Army Corps of Engineers *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (24 June 2010)

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Problematic hydrophytic vegetation

Description of the problem

Many factors affect the structure and composition of plant communities in the Western Mountains, Valleys, and Coast Region, including climatic variability, ephemeral water sources in some places, superabundance of moisture in others, salinity, and human land-use practices. As a result, some wetlands may exhibit indicators of hydric soil and wetland hydrology but lack any of the hydrophytic vegetation indicators presented in Chapter 2, at least at certain times. To identify and delineate these wetlands may require special procedures or additional analysis of factors affecting the site. To the extent possible, the hydrophytic vegetation decision should be based on the plant community that is normally present during the wet portion of the growing season in a normal rainfall year. The following procedure addresses several examples of problematic vegetation situations in the Western Mountains, Valleys, and Coast Region.

Procedure

Problematic hydrophytic vegetation can be identified and delineated using a combination of observations made in the field and/or supplemental information from the scientific literature and other sources. These procedures should be applied only where indicators of hydric soil and wetland hydrology are present, unless one or both of these factors is also disturbed or problematic, but no indicators of hydrophytic vegetation are evident. The following procedures are recommended:

1. Verify that at least one indicator of hydric soil and one primary or two secondary indicators of wetland hydrology are present. If indicators of either hydric soil or wetland hydrology are absent, the area is likely non-wetland unless soil and/or hydrology are also disturbed or problematic. If indicators of hydric soil and wetland hydrology are present (or are absent due to disturbance or other problem situations), proceed to step 2.

2. Verify that the area is in a landscape position that is likely to collect or concentrate water. Appropriate settings include the following. If the landscape setting is appropriate, proceed to step 3.

    a. Concave surface (e.g., depression or swale)
    b. Active floodplain or low terrace

c. Level or nearly level area (e.g., 0- to 3-percent slope)
d. Toe slope (Figure 4) or an area of convergent slopes (Figure 3)
e. Fringe of another wetland or water body
f. Area with a restrictive soil layer or aquitard within 24 in. (60 cm) of the surface
g. Area where groundwater discharges (e.g., a seep)
h. Other (explain in field notes why this area is likely to be inundated or saturated for long periods)

3. Use one or more of the approaches described in step 4 (Specific Problematic Vegetation Situations below) or step 5 (General Approaches to Problematic Hydrophytic Vegetation on page 108) to determine whether the vegetation is hydrophytic. In the remarks section of the data form or in the delineation report, explain the rationale for concluding that the plant community is hydrophytic even though indicators of hydrophytic vegetation described in Chapter 2 were not observed.

4. Specific Problematic Vegetation Situations

a. *Temporal shifts in vegetation*. As described in Chapter 2, the species composition of some wetland plant communities in the Western Mountains, Valleys, and Coast Region can change in response to seasonal weather patterns and long-term climatic fluctuations. Wetland types that are influenced by these shifts include, but are not limited to, wet prairies, vernal pools and other seasonal depressional wetlands, coastal interdunal wetlands, seeps, and springs. Lack of hydrophytic vegetation during dry periods should not immediately eliminate a site from further consideration as a wetland. A site qualifies for further consideration if the plant community at the time of sampling does not exhibit hydrophytic vegetation indicators, but indicators of hydric soil and wetland hydrology are present. The following sampling and analytical approaches are recommended in these situations:

(1) Seasonal Shifts in Plant Communities

(a) If possible, return to the site during the normal wet portion of the growing season and re-examine the site for indicators of hydrophytic vegetation.

(b) Examine the site for identifiable plant remains, either alive or dead, or other evidence that the plant community that was present during the normal wet portion of the growing season was hydrophytic.

(c) Use off-site data sources to determine whether the plant community that is normally present during the wet portion of the growing season is hydrophytic. Appropriate data sources include early growing season aerial photography, NWI maps, soil survey reports, other remotely sensed data, public interviews, and previous reports about the site.

(d) If the vegetation on the site is substantially the same as that on a wetland reference site having similar soils, landscape position, and known wetland hydrology, then consider the vegetation to be hydrophytic (see step 5b in this procedure for more information).

(2) Extended Drought Conditions (i.e., lasting more than two growing seasons)

(a) Investigate climate records (e.g., WETS tables, drought indices) to determine if the area is under the influence of a drought (for more information, see the section on "Wetlands that Periodically Lack Indicators of Wetland Hydrology" later in this chapter). If so, evaluate any off-site data that provide information on the plant community that exists on the site during normal years, including aerial photography, NWI maps, other remote sensing data, soil survey reports, public interviews, and previous site reports. Determine whether the vegetation that is present during normal years is hydrophytic.

(b) If the vegetation on the drought-affected site is substantially the same as that on a wetland reference site in the same general area having similar soils and known wetland hydrology, then consider the vegetation to be hydrophytic (see step 5b in this procedure).

b. *Sparse and patchy vegetation*. Some wetlands in the Western Mountains, Valleys, and Coast Region have sparse or patchy vegetation

cover. Examples include some tidal marshes, alkaline flats, kettle depressions, and interdunal swale wetlands. These areas may have indicators of hydric soils and wetland hydrology, but the vegetation is not continuous across or along the boundary of the wetland. Delineation of these areas can be confusing due to the interspersion of wetlands and other potential waters of the United States. For wetland delineation purposes, an area should be considered vegetated (and a potential wetland) if there is 5 percent or more areal cover of plants at the peak of the growing season. Unvegetated areas have less than 5 percent plant cover. Patchy vegetation is a mosaic of both vegetated and unvegetated areas (Figure 53). In some cases, the unvegetated portions of a wet site may meet the requirements for other waters of the United States. Therefore, delineation of such sites should include consideration of both wetlands and other waters. See the Arid West regional supplement (U.S. Army Corps of Engineers 2008) for further information.

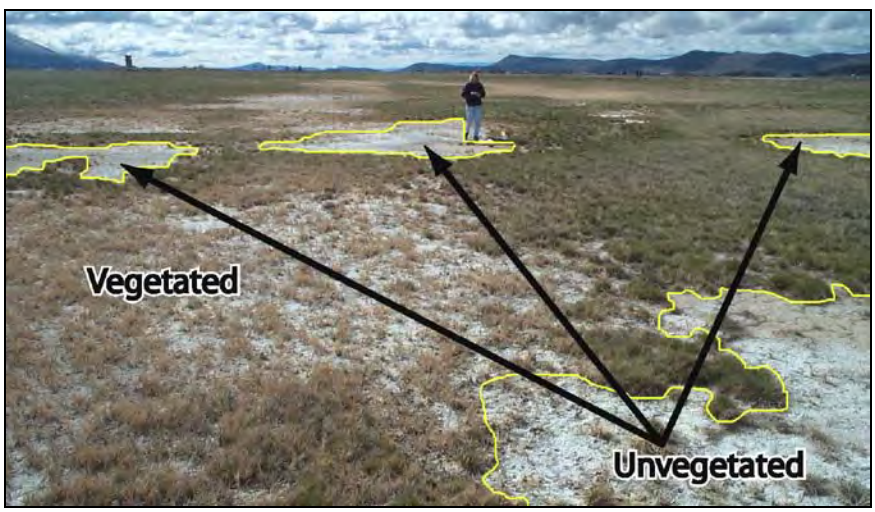

Figure 53. Example of sparse and patchy plant cover in a wetland. Areas labeled as vegetated have 5 percent or more plant cover. Unvegetated areas (less than 5 percent plant cover) may meet requirements as other waters of the United States.

c. *Riparian areas.* Riparian ecosystems are highly variable across the region, and can contain both wetland and non-wetland components. Riparian corridors can be lined with hydrophytic vegetation, upland vegetation, unvegetated areas, or a mosaic of these types. Soils may lack hydric soil indicators in recently deposited materials (i.e., Entisols) even when indicators of hydrophytic vegetation and wetland hydrology are present. Surface hydrology can vary from perennial to intermittent

and, after a flooding event, water tables can drop quickly to low levels. Therefore, wetland delineation in western riparian areas is often a challenge and should consider the potential interspersion of wetlands and other potential waters of the United States. In addition, many riparian areas contain remnant stands of tree species that may have germinated during unusually high-water events or under wetter conditions than currently exist at the site (Figure 54). Examples of species that occur in these situations include narrowleaf cottonwood, willows, balsam poplar, and red alder. These areas may support phreatophytic species that, when mature, are able to exploit groundwater that is too deep to support wetlands. In such situations, there may be a hydrophytic overstory and a non-hydrophytic understory. If the soils are Entisols lacking hydric soil features and/or wetland hydrology is problematic, the hydrophytic vegetation determination should emphasize understory species, which may be more indicative of current wetland or non-wetland conditions.

Figure 54. Mature *Populus deltoides* stand on an elevated floodplain terrace with xeric understory on the South Fork of the Shoshone River, Wyoming.

d. *Areas affected by grazing.* Short- and long-term grazing can cause shifts in dominant species in the vegetation. Grazers can influence the abundance of plant species in several ways. For example, trampling by large herbivores can cause soil compaction, altering soil permeability and infiltration rates and affecting the plant community. Grazers can

also influence the abundance of plant species by selectively grazing certain species or avoiding other species. Shifts in species composition due to grazing can influence a hydrophytic vegetation determination. Be aware that shifts in both directions, favoring either wetland species or non-wetland species, can occur in these situations. Limited grazing does not necessarily affect the outcome of a hydrophytic vegetation decision. However, the following approaches are recommended in cases where the hydrophytic vegetation determination would be unreliable or misleading due to the effects of grazing.

(1) Examine the vegetation on a nearby, ungrazed reference site having similar soils and hydrologic conditions. Ungrazed areas may be present on adjacent properties or in fenced exclosures or streamside management zones. Assume that the same plant community would exist on the grazed site, in the absence of grazing.

(2) If feasible, remove livestock or fence representative livestock exclusion areas to allow the vegetation time to recover from grazing, and reevaluate the vegetation during the next growing season.

(3) If grazing was initiated recently, use offsite data sources such as aerial photography, NWI maps, and interviews with the land owner and other persons familiar with the area to determine the plant community present on the site before grazing began. If the previously ungrazed community was hydrophytic, then consider the current vegetation to be hydrophytic.

(4) If an appropriate ungrazed area cannot be located or if the ungrazed vegetation condition cannot be determined, make the wetland determination based on indicators of hydric soils and wetland hydrology.

e. *Managed plant communities.* Many natural plant communities throughout the region have been altered and are managed to meet human goals. Examples include clearing of woody vegetation on rangelands, periodic disking or plowing, planting of native and non-native species, irrigation of pastures and hayfields, suppression of wildfires, and the use of herbicides. These actions can result in elimination of certain species and their replacement with other species, changes in abundance of certain plants, and shifts in dominant species,

possibly influencing a hydrophytic vegetation determination. The following approaches are recommended if the natural vegetation has been altered through management to such an extent that a hydrophytic vegetation determination may be unreliable:

(1) Examine the vegetation on a nearby, unmanaged reference site having similar soils and hydrologic conditions. Assume that the same plant community would exist on the managed site, in the absence of human alteration.

(2) For recently cleared or tilled areas (not planted or seeded), leave representative areas unmanaged for at least one growing season with normal rainfall and reevaluate the vegetation.

(3) If management was initiated recently, use offsite data sources such as aerial photography, NWI maps, and interviews with the land owner and other persons familiar with the area to determine what plant community was present on the site before the management occurred.

(4) If the unmanaged vegetation condition cannot be determined, make the wetland determination based on indicators of hydric soil and wetland hydrology.

f. *Aggressive invasive plants.* Native and non-native aggressive, invasive FACU or UPL plant species often become established in wetlands due to their adaptability and aggressive growth habits. Invasive species include planted or seeded species that have escaped and become widely established. Invasive species often prevent the establishment of other species by competing successfully for space, sunlight, or other resources. Examples of invasive species in the region include blackberry (*Rubus discolor* and *R. ursinus*), English ivy (*Hedera helix*), gorse (*Ulex europaeus*), and various pasture species, such as creeping soft grass (*Holcus mollis*) and sweet vernal grass (*Anthoxanthum odoratum*). Certain FAC and FACW species are also aggressive competitors and may dominate non-wetland areas; however, these areas are unlikely to be mistaken for wetlands due to the lack of hydric soil and/or wetland hydrology indicators. The following approaches are recommended when the site has indicators of hydric soil and wetland hydrology but the plant community is dominated by FACU or UPL

aggressive, invasive plant species. To use these approaches, there must be evidence of the species' invasive nature, such as published literature or listing of the species on a state or local list of invasive plants (e.g., see the USDA Plants database http://plants.usda.gov/index.html).

(1) Examine a nearby reference site having similar soils, topography, and hydrologic conditions, and a similar plant community without or with reduced presence of the invasive species. Assume that the same plant community would exist on the original site, if invasive species were not prevalent.

(2) If feasible, remove the invasive species and reevaluate the vegetation during the next growing season. Take into consideration that many invasive species are very difficult to remove and will resprout or reemerge next season. However, even temporary removal of the invasive plant may release other species.

(3) If an appropriate reference site cannot be located and the invasive species cannot be removed and the site reevaluated next season, make the wetland determination based on indicators of hydric soil and wetland hydrology.

g. *Areas affected by fires, floods, and other natural disturbances.* Wildfires, floods, and other catastrophic disturbances can dramatically alter the vegetation on a site. Vegetation can be completely or partially removed, or its composition altered, depending upon the intensity of the disturbance. Limited disturbance does not necessarily affect the investigator's ability to determine whether the plant community is or is not hydrophytic. However, if the vegetation on a site has been removed or made unidentifiable by a recent fire, flood, or other disturbance, then one or more of the following approaches may be used to determine whether the vegetation present before the disturbance was hydrophytic. Additional guidance can be found in the Atypical Situations section of the Corps Manual.

(1) Examine the vegetation on a nearby, undisturbed reference site having similar soils and hydrologic conditions. Assume that the same plant community would exist on the disturbed site in the absence of disturbance.

(2) Use off-site information sources such as aerial photography, NWI maps, and interviews with knowledgeable individuals to determine the plant community present on the site before the disturbance.

(3) If the undisturbed vegetation condition cannot be determined, make the wetland determination based on indicators of hydric soil and wetland hydrology.

h. *Vigor and stress responses to wetland conditions.* Plant responses to wet site conditions are often easily observable. Many plants develop stress-related features, such as stunting in agricultural crops and browning or yellowing of native or planted vegetation, when subjected to long periods of soil saturation in the root zone. Crop stress in wet agricultural fields is often easily identifiable both in the field and on aerial photography. In relatively frost-free areas, such as near the Pacific coast, early-season germination of FACU and UPL species occurs in some wetlands (e.g., vernal pools) prior to the onset of seasonal hydrology. These plants may persist and dominate in wetlands during the normal wet season, but often show evidence of stress (e.g., stunting, browning, yellowing) compared to the same species growing in nearby non-wetlands. In addition, many species grow more abundantly or vigorously on wet sites, particularly later in the growing season when adjacent areas are drying out but moist soils are still present in wetlands. These responses are not species specific or easily measurable but are evident when the vegetation of wetlands and adjacent non-wetlands is compared. The following procedure can help determine whether an observed increase or decrease in plant vigor or stress is the result of growing in wetlands. The procedure assumes that indicators of hydric soil and wetland hydrology are present in the potential wetland area. Use caution in areas where variations in plant vigor or stress may be due to variations in salinity or other soil conditions, uneven application of fertilizers or herbicides, or other factors not related to wetness.

(1) Compare and describe in field notes the size, vigor, or other stress-related characteristics of individuals of the same species between the potential wetland area and the immediately surrounding non-wetlands. Emphasize features that can be measured or photographed and include this information in the field report. To qualify for this procedure, most individuals of the affected species must

show vigor/stress responses in the wet area. If there are clear differences in plant vigor/stress responses between potential wetland and adjacent non-wetland areas, proceed to step 2.

(2) Observe and describe trends in plant vigor or stress conditions along the topographic or wetness gradient from the potential wetland to the adjacent non-wetland areas. Trends in plant vigor/stress responses must reflect the distribution of hydric soils, wetland hydrology indicators, topography, and/or landscape conditions relevant to wetlands. If so, proceed to step 3.

(3) Consider the area containing indicators of hydric soil, wetland hydrology, and evidence of plant vigor or stress to be a wetland. Determine the wetland boundary based on the spatial patterns in these features plus topography and landscape characteristics.

5. General Approaches to Problematic Hydrophytic Vegetation. The following general procedures are provided to identify hydrophytic vegetation in difficult situations not necessarily associated with specific vegetation types or management practices, including wetlands dominated by FACU, NI, NO, or unlisted species that are functioning as hydrophytes. These procedures should be applied only where indicators of hydric soil and wetland hydrology are present (or are absent due to disturbance or other problem situations) but indicators of hydrophytic vegetation are not evident. The following approaches are recommended:

a. *Direct hydrologic observations.* Verify that the plant community occurs in an area subject to prolonged inundation or soil saturation during the growing season. For example, lodge-pole pine (*Pinus contorta*), a FAC to FACU species in the region, occasionally dominates the vegetation in areas that have saturated soil conditions during the early part of the growing season. Other examples of FACU species that sometimes dominate wetlands in the region include western hemlock (Kuchler 1946; Waring and Franklin 1979), ponderosa pine, salal (*Gaultheria shallon*), Himalayan blackberry (*Rubus armeniacus* = *R. discolor* = *R. procerus*), and Kentucky bluegrass (*Poa pratensis*) (indicator status may vary by plant list region). Problematic hydrophytic vegetation can be evaluated by visiting the site at 2- to 3-day intervals during the portion of the growing season when surface water is most likely to be present or water tables are normally high.

Hydrophytic vegetation is considered to be present, and the site is a wetland, if surface water is present and/or the water table is 12 in. (30 cm) or less from the surface for 14 or more consecutive days during the growing season during a period when antecedent precipitation has been normal or drier than normal. If necessary, microtopographic highs and lows should be evaluated separately. The normality of the current year's rainfall must be considered in interpreting field results, as well as the likelihood that wet conditions will occur on the site at least every other year (for more information, see the section on "Wetlands that Periodically Lack Indicators of Wetland Hydrology" in this chapter).

b. *Reference sites.* If indicators of hydric soil and wetland hydrology are present, the site may be considered to be a wetland if the landscape setting, topography, soils, and vegetation are substantially the same as those on nearby wetland reference areas. Hydrologic characteristics of wetland reference areas should be documented through long-term monitoring or by application of the procedure described in item 5a above. Reference sites should be minimally disturbed and provide long-term access. Soils, vegetation, and hydrologic conditions should be thoroughly documented and the data kept on file in the district or field office.

c. *Technical literature.* Published and unpublished scientific literature may be used to support a decision to treat specific FACU species or species with no assigned indicator status (e.g., NI, NO, or unlisted) as hydrophytes or certain plant communities as hydrophytic. Preferably, this literature should discuss the species' natural distribution along the moisture gradient, its capabilities and adaptations for life in wetlands, wetland types in which it is typically found, or other wetland species with which it is commonly associated.

Problematic hydric soils

Description of the problem

Soils with faint or no indicators

Some soils that meet the hydric soil definition may not exhibit any of the indicators presented in Chapter 3. These problematic hydric soils exist for a number of reasons and their proper identification requires additional

Appendix C

Normal Precipitation Curves

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Our analysis of precipitation patterns preceding our 2012 and 2014 field work looked at both the amount of rain that fell preceding the delineations and the number of consecutive days without rainfall. A “rain-free period” was considered to be two or more consecutive days with no rain. The standard duration of observation was considered to be 90 days prior to the delineation date. This number is consistent with the standard period of observation for determining normal precipitation (one month, two months, and three months for the NRCS methodology, and 30 days, 60 days, and 90 days for the Sprecher and Warne methodology).

Over the 90 days prior to our 18 May 2012 delineation, approximately 16.25 inches of rain fell in the vicinity of Gunshy Manor. There were seven rain-free periods over the 90 days prior to 18 May 2012. The total number of rain-free days within these seven periods was 28. The longest rain-free duration period was nine days. The average duration of rain-free periods for the 90-days prior to 18 May 2012 was 4. The average precipitation in inches for the 90 days prior to 18 May 2012 (excluding days with 0 inches of precipitation) was 0.29 over 62 days. These rain-free periods were generally evenly spaced over the 90-days prior to our 2012 delineation.

Over the 90 days prior to our 14 August 2014 delineation, approximately 5.79 inches of rain fell in the vicinity of Gunshy Manor. There were seven rain-free periods over the 90 days prior to 14 August 2014. The total number of rain-free days within these seven periods was 57. The longest rain-free duration period was 20 days. The average duration of rain-free periods for the 90 days prior to 14 August 2014 was 8. The average precipitation in inches for the 90 days prior to 14 August 2014 (excluding days with 0 inches of precipitation) was 0.19 inches over 33 days. These rain-free periods generally occurred closer to the date of our 2014 delineation.

We further analyzed the 90 day datasets for skew, which measures the degree to which a dataset differs from a normal curve (asymmetry). Results of the skew test can be positive or negative. Positive skew indicates that the asymmetry is to the left of the mean and negative skew indicates that the asymmetry is to the right of the mean. The value of the skew indicates the degree to which the curve is asymmetrical (how much the median differs from the mean). For the 90 days prior to 18 May 2012, the skew value was 1.8, and for the 90 days prior to 14 August 2014, the skew value was 4.8. This suggests that the pattern of rainfall for the 90 days prior to 18 May 2012 was much more regular and more closely centered around the arithmetic mean than the pattern of rainfall for the 90 days prior to 14 August 2014. Less rain fell during the 90 days prior to 14 August 2014 compared to the 18 May 2012 period.

We have noted that a significant rain event occurred on 23 July 2014 where 1.33 inches of rain fell within a 24-hour period. This is an uncharacteristically large amount of rain to fall during the summer months of the Pacific Northwest. This one-day rain event was sufficient to move the 30-day rolling total precipitation that was trending drier than normal to wetter than normal. Due to the way the precipitation curves are calculated, this anomalous rain event affected the analysis of normal precipitation for 30 days, after which it drops out of the equation for the 30-day rolling total. We believe that the

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patterns of precipitation without this unusual rain event would likely have been between normal and drier than normal.

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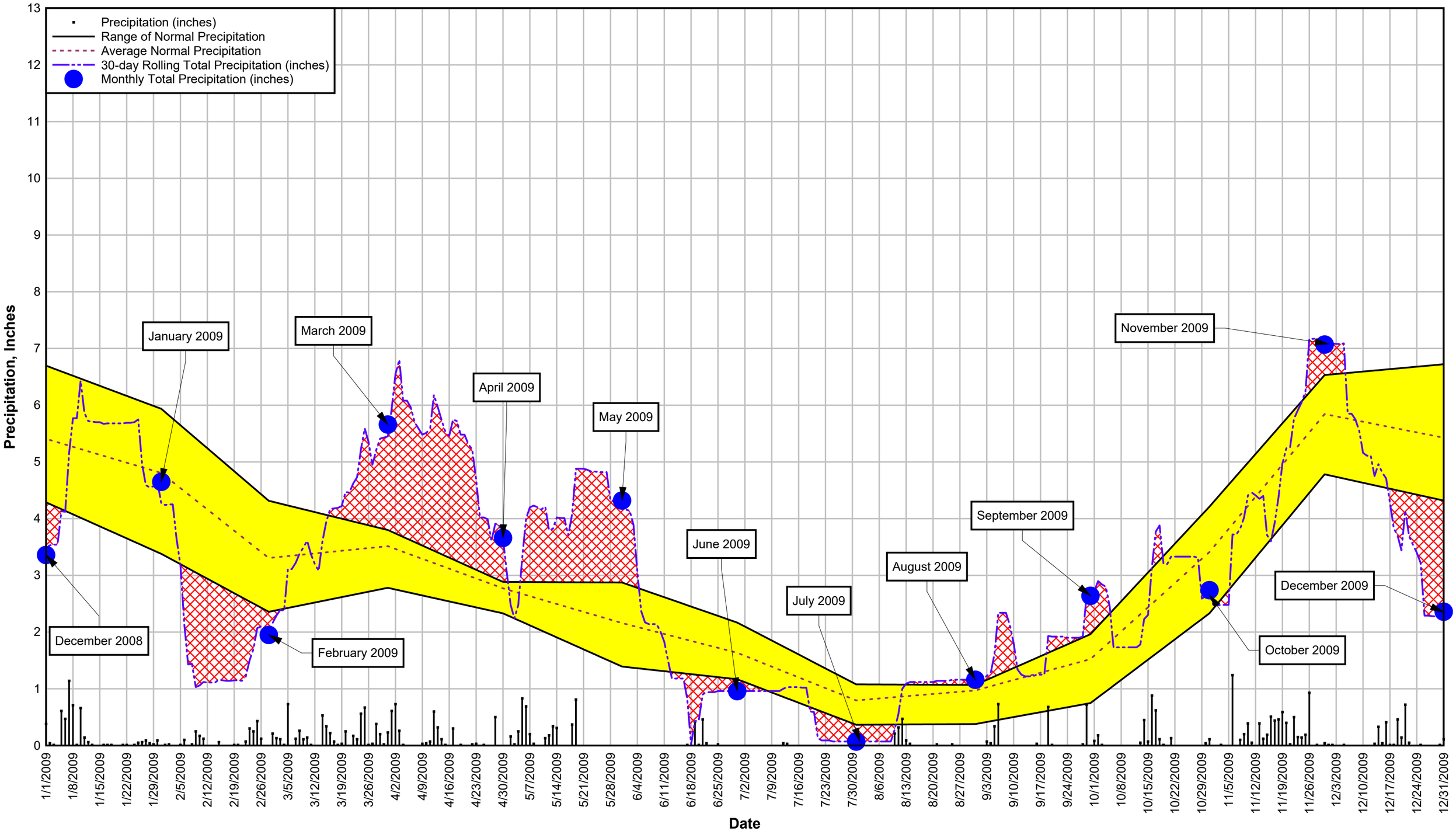
Normal Precipitation Curves for Water Year 2009

Gunshy Manor

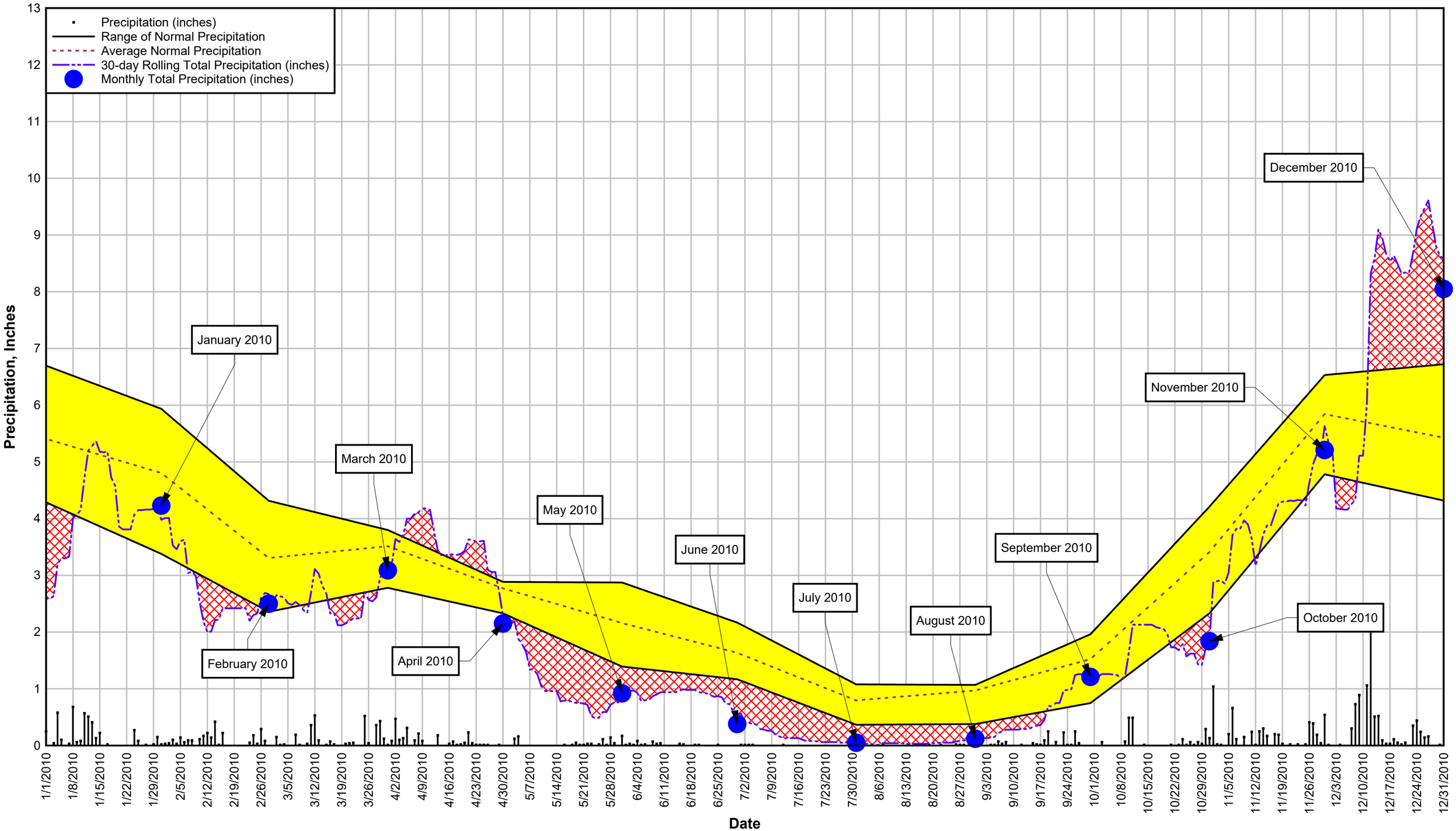
Sand Point WETS Table (2010)

Weather Station KWAREDMO34 and KWAREDMO6



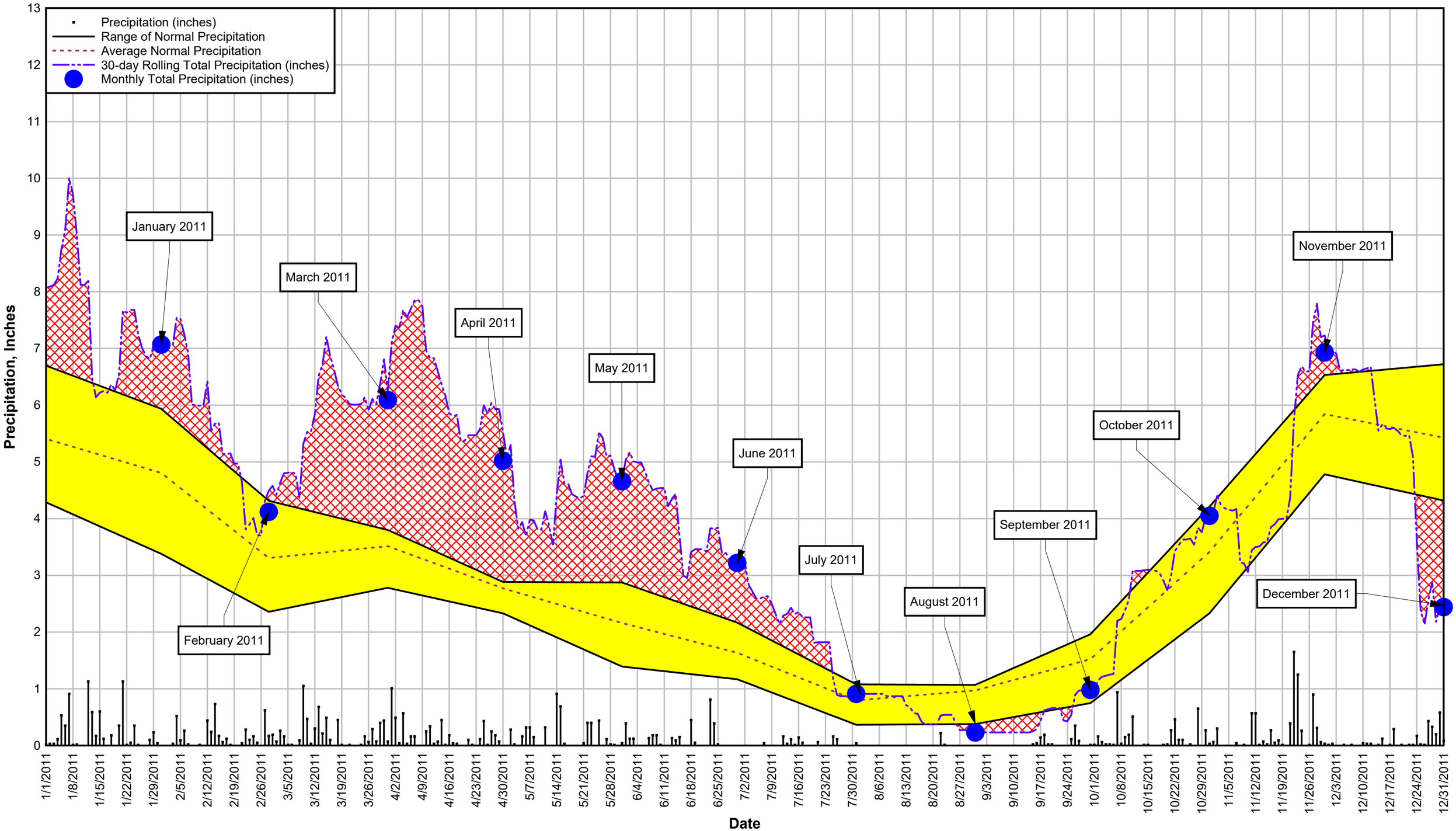
Normal Precipitation Curves for Water Year 2010

Gunshy Manor
Sand Point WETS Table (2010)
Weather Station KWAREDMO34



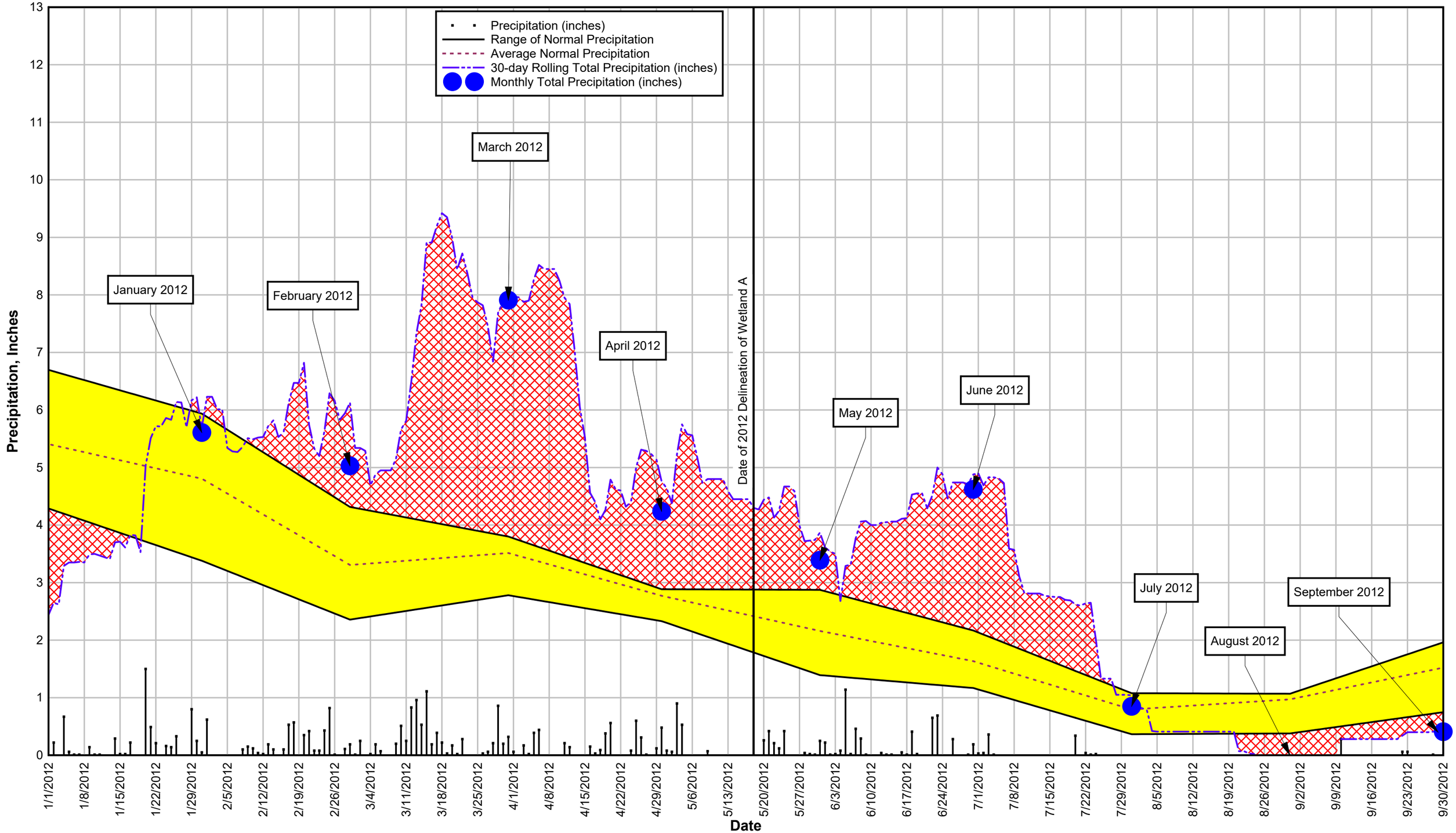
Normal Precipitation Curves for Water Year 2011

Gunshy Manor
Sand Point WETS Table (2010)
Weather Station KWAREDMO34



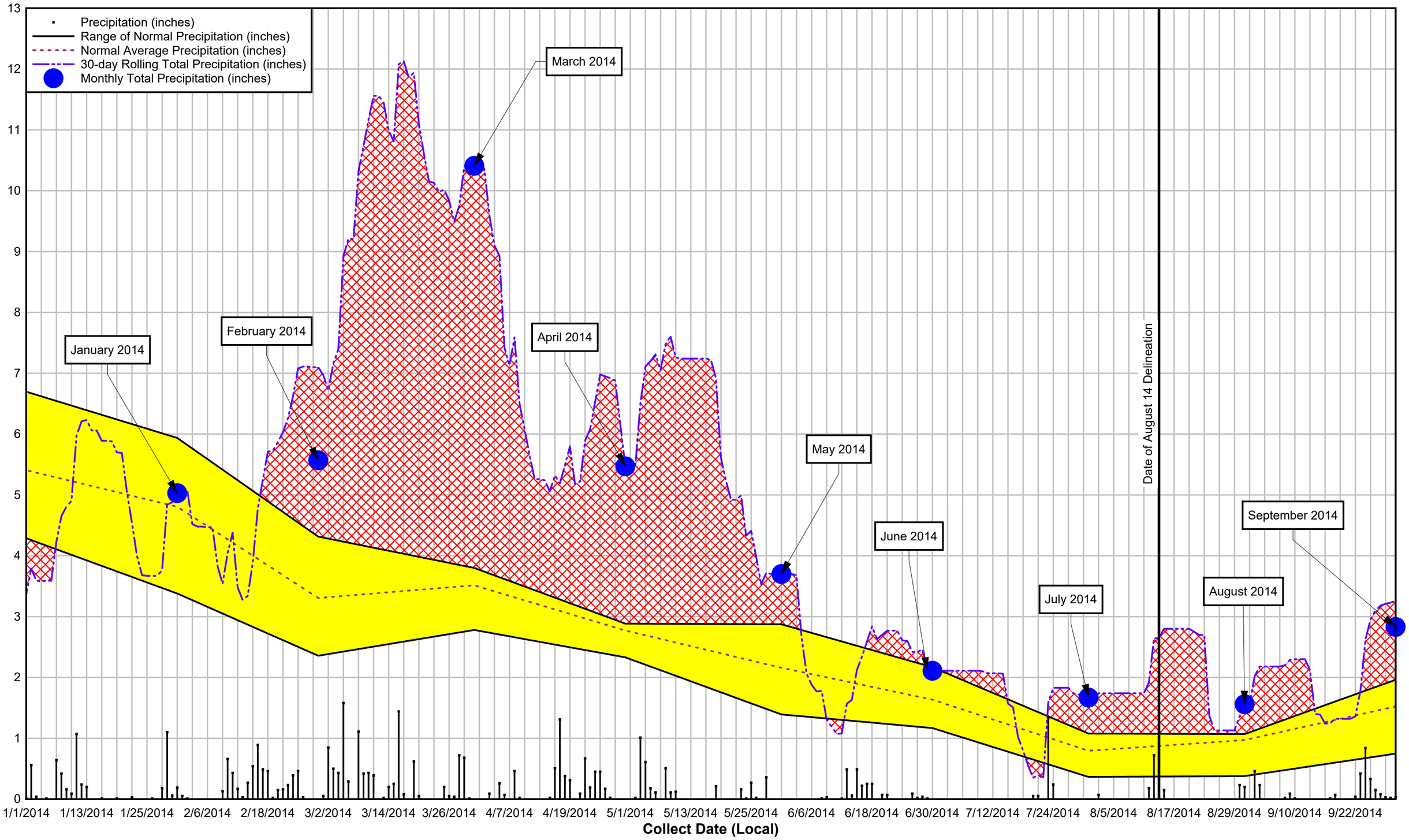
Normal Precipitation Curves for Water Year 2012

Gunshy Manor
Sand Point WETS Table (2010)
Weather Station KWAREDMO34



Normal Precipitation Curve for Water Year 2014

Gunshy Manor
Sand Point WETS Table (2010)
Weather Station KWAREDMO34



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Appendix D

Wetland Datasheets

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WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: TAL-1147 City/County: King Sampling Date: 05-18-12

Applicant/Owner: Buff Nelson State: Washington Sampling Point: TPA-1

Investigator(s): DRT Section, Township, Range: NW 1/4 Section 8, T25N, R6E

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

Subregion (LRR): A Lat: 47.6692 Long: -122.0735 Datum: NAD83

Soil Map Unit Name: Seattle Muck NWI classification: PEM

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

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

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

Hydrophytic Vegetation Present? Yes ☒ No ☐ Hydric Soil Present? Yes ☒ No ☐ Wetland Hydrology Present? Yes ☒ No ☐	**Is the Sampled Area within a Wetland?** Yes ☒ No ☐
Remarks: All three required wetland parameters have been met	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Thuja plicata*	<2		FAC
2.			
3.			
4.			
	<2 = Total Cover		
Chapter 1. Sapling/Shrub Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft)			
1. *Alopecurus pratensis*	50	Yes	FACW
2. *Ranunculus repens*	10		FACW
3. *Juncus effusus*	10		FACW
4.			
5.			
6.			
7.			
8.			
	70 = Total Cover		
Woody Vine Stratum (Plot size: N/A)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 30 % Cover of Biotic Crust N/P

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	70	x 2 = 140
FAC species	2	x 3 = 6
FACU species	0	x 4 = 0
UPL species	0	x 5 = 0
Column Totals:	72 (A)	146 (B)

Prevalence Index = B/A = 2.0

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☒ Prevalence Index is ≤3.0[1]

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

☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks:

SOIL

Sampling Point: TPA-1

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 2/1	100					SCIL	

[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**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: Hardpan clay

Depth (inches): 8

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks:

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) (**Non riverine**)
- ☐ Sediment Deposits (B2) (**Non riverine**)
- ☐ Drift Deposits (B3) (**Non riverine**)
- ☐ 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 ☒ Depth (inches): -

Water Table Present? Yes ☐ No ☒ Depth (inches): >20

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): >20

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: TAL-1147 City/County: King Sampling Date: 05-18-12

Applicant/Owner: Buff Nelson State: Washington Sampling Point: TPA-2

Investigator(s): DRT Section, Township, Range: NW 1/4 Section 8, T25N, R6E

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

Subregion (LRR): A Lat: 47.6692 Long: -122.0735 Datum: NAD83

Soil Map Unit Name: Seattle Muck NWI classification: N/A

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

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

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

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

Remarks: Hydrophytic vegetation is present, but dominated by FAC plants. All three required wetland parameters have not been met within sampled location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Thuja plicata*	5	Yes	FAC
2. *Alnus rubra*	10	Yes	FAC
3.			
4.			
		= Total Cover	

Chapter 2.

Sapling/Shrub Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	

Herb Stratum (Plot size: 5 ft)			
1. *Agrostis capillaris*	90	Yes	FAC
2. *Ranunculus repens*	5		FACW
3. *Ranunculus acris*	5		FACW
4.			
5.			
6.			
7.			
8.			
		= Total Cover	

Woody Vine Stratum (Plot size: N/A)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum N/P % Cover of Biotic Crust N/P

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	0	x 1 = 0
FACW species	10	x 2 = 20
FAC species	105	x 3 = 315
FACU species	0	x 4 = 0
UPL species	0	x 5 = 0
Column Totals:	115 (A)	335 (B)

Prevalence Index = B/A = 2.9

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks:

SOIL

Sampling Point: TPA-2

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR3/2	100					SCIL	
3-18	10YR 5/3	90	10YR 7/8	10	C	M	SCIL	

[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**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks:

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) (**Non riverine**)
- ☐ Sediment Deposits (B2) (**Non riverine**)
- ☐ Drift Deposits (B3) (**Non riverine**)
- ☐ 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 ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? **Yes** ☐ **No** ☒

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

Remarks:

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

Project/Site: TAL-1147 City/County: King Sampling Date: 8-26-14

Applicant/Owner: Buff Nelson State: Washington Sampling Point: TPB-1

Investigator(s): DRT Section, Township, Range: NW 1/4 Section 8, T25N, R6E

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

Subregion (LRR): A Lat: 47.6692 Long: -122.0735 Datum: NAD83

Soil Map Unit Name: Norma Loam NWI classification: N/A

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

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

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

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

Remarks: Hydrophytic vegetation may be the result of farm management practices in maintaining pasture land. All three required wetland parameters have not been met within the sampled location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: N/P)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		

Chapter 3.

Sapling/Shrub Stratum (Plot size: N/P)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		

Herb Stratum (Plot size: 5 ft)			
1. *Holcus lanatus*	40	Yes	FAC
2. *Phalaris arundinacea*	40	Yes	FACW
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

Woody Vine Stratum (Plot size: N/P)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum N/P % Cover of Biotic Crust N/P

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		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Site is mowed and maintained as pasture and hay operations.

SOIL

Sampling Point: TPB-1

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/2	100					SiL	
12"+	310Y	100					Cl	

[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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1 (**except MLRA 1**))
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: Clay

Depth (inches): 12

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks: Clay layer does not meet the definition of a gleyed color.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes ☐	No ☒	Depth (inches):
Water Table Present?	Yes ☐	No ☒	Depth (inches): >16
Saturation Present? (includes capillary fringe)	Yes ☐	No ☒	Depth (inches): >16

Wetland Hydrology Present? **Yes** ☐ **No** ☒

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

Remarks:

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

Project/Site: TAL-1147 City/County: King Sampling Date: 8-26-14

Applicant/Owner: Buff Nelson State: Washington Sampling Point: TPB-2

Investigator(s): DRT Section, Township, Range: NW 1/4 Section 8, T25N, R6E

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

Subregion (LRR): A Lat: 47.6692 Long: -122.0735 Datum: NAD83

Soil Map Unit Name: Norma Loam NWI classification: PEM

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

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

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

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

Remarks: All three required wetland parameters have been met within the sampled location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: N/P)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		

Chapter 4.

Sapling/Shrub Stratum (Plot size: N/P)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		

Herb Stratum (Plot size: 5 ft)			
1. *Carex sp*	20		OBL
2. *Phalaris arundinacea*	80	Yes	FACW
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

Woody Vine Stratum (Plot size: N/P)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum N/P % Cover of Biotic Crust N/P

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		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

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

☒ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Unable to determine which Carex is growing within wetland due to recent mowing. It appears that the Carex is being spread by mowing activities based on the appearance of spread on the ground.

SOIL

Sampling Point: TPB-2

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6							Peat	Mostly dead root material
6-8	10YR 3/2	100					SiL w. Peat	
8"+	3Y10	100					Cl	

[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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1 (**except MLRA 1**))
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: Clay

Depth (inches): 8 inches

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks: Positive indications for oxidized rhizosheres (with living roots) and positive reaction to dipyridyl.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: TAL-1147 City/County: King Sampling Date: 08-27-14

Applicant/Owner: Buff Nelson State: Washington Sampling Point: TPB-3

Investigator(s): J. Martin Section, Township, Range: NW 1/4 Section 8, T25N, R6E

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

Subregion (LRR): A Lat: 47.6692 Long: -122.0735 Datum: NAD83

Soil Map Unit Name: Norma Silt Loam NWI classification: PEM

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

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

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

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

Remarks: Meets the 3 parameters for presence of a wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0%	= Total Cover	

Chapter 5.

Sapling/Shrub Stratum (Plot size: 15-ft)			
1. *Spirea douglassii*	20	Yes	FACW
2. *Salix scouleriana*	05	No	FACW
3. *Salix lucida Muhl. ssp. lasiandra (Benth.)*	05	No	FACW
4.			
5.			
	30	= Total Cover	

Herb Stratum (Plot size: 5-ft)			
1. *Typha latifolia*	10	No	OBL
2. *Ranunculus repens*	05	No	FACW
3. *Juncus effusus*	10	No	FACW
4. *Phalaris arundinacea*	90	Yes	FACW
5. *Scirpus microcarpus*	35	Yes	OBL
6.			
7.			
8.			
	150	= Total Cover	

Woody Vine Stratum (Plot size: N/P)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum N/P % Cover of Biotic Crust N/P

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	2	x 1 = 2
FACW species	6	x 2 = 12
FAC species	0	x 3 = 0
FACU species	0	x 4 = 0
UPL species	0	x 5 = 0
Column Totals:	8 (A)	14 (B)

Prevalence Index = B/A = 1.75

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☒ Prevalence Index is ≤3.0[1]

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

☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks:

SOIL

Sampling Point: TPB-3

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/1	100	--	--	--	--	CL Lo	Organic content high

[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**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks: Water in pit at 12" bgs prevented characterization of soils below 12" depth.

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) (**Non riverine**)
- ☐ Sediment Deposits (B2) (**Non riverine**)
- ☐ Drift Deposits (B3) (**Non riverine**)
- ☐ 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 ☐ Depth (inches): >1' (near plot)

Water Table Present? Yes ☒ No ☐ Depth (inches): 12" bgs

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 0" bgs

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks: Surface water in channelized (Evans?) creek nearby overland flows occur at this location during high water events.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: TAL-1147 City/County: King Sampling Date: 08-27-14

Applicant/Owner: Buff Nelson State: Washington Sampling Point: TPB-4

Investigator(s): J. Martin Section, Township, Range: NW 1/4 Section 8, T25N, R6E

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

Subregion (LRR): A Lat: 47.6692 Long: -122.0735 Datum: NAD83

Soil Map Unit Name: Norma Silt Loam NWI classification: N/A

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

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

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

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

Remarks: Does not meet the 3 parameters for presence of a wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0%	= Total Cover	

Chapter 6.

Sapling/Shrub Stratum (Plot size: 15-ft)			
1.			
2.			
3.			
4.			
5.			
	0%	= Total Cover	

Herb Stratum (Plot size: 5-ft)			
1. *Poa pratensisa*	80	Yes	FAC
2. *Ranunculus repens*	05	No	FAC
3. *Plantago lanceolatas*	10	No	FACU
4. *Festuca rubra*	90	Yes	FAC
5. *Festuca arundinacea*	35	No	FACU
6. *Holcus lanatus*	50	No	FAC
7.			
8.			
	270	= Total Cover	

Woody Vine Stratum (Plot size: N/P)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum N/P % Cover of Biotic Crust N/P

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	0	x 2 = 0
FAC species	4	x 3 = 12
FACU species	2	x 4 = 8
UPL species	0	x 5 = 0
Column Totals:	6 (A)	20 (B)

Prevalence Index = B/A = 3.33

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Presence of marginal hydrophytic vegetation within sampled plot.

SOIL

Sampling Point: TB-4

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR 3/3	100	--	--	--	--	SiCl	
7-16	10YR 3/2	100	--	--	--	--	SiLo	

[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**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks: Soil looks high in organic content.

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) (**Non riverine**)
- ☐ Sediment Deposits (B2) (**Non riverine**)
- ☐ Drift Deposits (B3) (**Non riverine**)
- ☐ 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 ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? **Yes** ☐ **No** ☒

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

Remarks: Appears to be gravel fill berm/access road along property boundary.

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

Project/Site: TAL-1147 (Gunshy) City/County: King Sampling Date: 8/27/14

Applicant/Owner: Buff Nelson State: WA Sampling Point: TPB-5

Investigator(s): J. Martin Section, Township, Range: NW 1/4 Section 8, T25N, R6E

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

Subregion (LRR): LRAA Lat: 47.6692 Long: 122.0735 Datum: NAD83

Soil Map Unit Name: Seattle Muck NWI classification: PEM

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

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

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

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

Remarks: Sampled location meets all three required parameters for wetland presence.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Alnus rubra*	80	Yes	FAC
2. *Thuja plicata*	10	No	FAC
3.			
4.			
	90	= Total Cover	
Chapter 7. Sapling/Shrub Stratum (Plot size: 15-ft)			
1. *Vaccinium parvifolium*	05	No	FACU
2. *Polystichum munitum*	05	No	FACU
3. *Acer circinatum*	20	Yes	FAC
4. *Rubus spectabilis*	85	Yes	FAC
5. *Spirea douglassii*	15	No	FACW
	130	= Total Cover	
Herb Stratum (Plot size: 05-ft)			
1. *Athyrium filix-femina*	10	No	FAC
2. *Carex stipata*	15	No	OBL
3. *Luzula parviflora.*	05	No	FAC
4. *Solanum dulcamara*	75	Yes	FAC
5. *Impatiens glandulifera Royle*	75	Yes	FACW
6. *Glyceria elata*	15	No	FACW
7.			
8.			
	195	= Total Cover	
Woody Vine Stratum (Plot size: N/P)			
1.			
2.			
		= Total Cover	

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	1	x 1 = 1
FACW species	3	x 2 = 6
FAC species	7	x 3 = 21
FACU species	2	x 4 = 8
UPL species	0	x 5 = 0
Column Totals:	13 (A)	36 (B)

Prevalence Index = B/A = 2.76

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☒ Prevalence Index is ≤3.0[1]

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

☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Vaccinium, Acer, and Polystichum not rooted within sampled plot; provided aerial cover rooted in rotting wood or upland edge. Sampled location meets parameter for hydrophytic vegetation presence.

SOIL

Sampling Point: TPB-5

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/1	--	--	--	--	--	organic	peaty soils
12-18	10YR 2/2	100	--	--	--	--	organic	peaty soils
18-20	10YR 4/1	100	--	--	--	--	Clay	

[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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1 (**except MLRA 1**))
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: shallow aquitard

Depth (inches): 13" bgs

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 0" bgs

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks:

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

Project/Site: TAL-1147 (Gunshy) City/County: King Sampling Date: 8/27/14

Applicant/Owner: Buff Nelson State: WA Sampling Point: TPB-6

Investigator(s): J. Martin Section, Township, Range: NW 1/4 Section 8, T25N, R6E

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

Subregion (LRR): LRAA Lat: 47.6692 Long: 122.0735 Datum: NAD83

Soil Map Unit Name: Seattle Muck NWI classification: N/A

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

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

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

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

Remarks: Sampled location does not meet all three required parameters for wetland presence.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Alnus rubra*	90	Yes	FAC
2.			
3.			
4.			
	90 = Total Cover		
Chapter 8. Sapling/Shrub Stratum (Plot size: 15-ft)			
1. *Rubus armeniacus*	05	No	FACU
2. *Polystichum munitum*	40	Yes	FACU
3. *Rubus spectabilis*	45	Yes	FAC
4.			
5.			
	90 = Total Cover		
Herb Stratum (Plot size: 05-ft)			
1. *Gymnocarpium dryopteris*	05	No	FACU
2. *Agrostis capillaris*	15	No	FAC
3. *Phalaris arundinacea*	05	No	FACW
4. *Ranunculus repens*	15	No	FAC
5.	75	Yes	FACW
6.	15	No	FACW
7.			
8.			
	130 = Total Cover		
Woody Vine Stratum (Plot size: N/P)			
1.			
2.			
	0 = 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: 3 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	3	x 2 = 6
FAC species	4	x 3 = 12
FACU species	3	x 4 = 12
UPL species	0	x 5 = 0
Column Totals:	10 (A)	30 (B)

Prevalence Index = B/A = 3.0

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☒ Prevalence Index is ≤3.0[1]

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

☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Sampled location contains marginal wetland vegetation.

SOIL

Sampling Point: TPB-6

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/3	--	--	--	--	--	SiLo	
6-16	10YR 3/3	100	--	--	--	--	SiLo	Angular cobble fill dirt
			--					

[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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1 (**except MLRA 1**))
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: s

Depth (inches):

Hydric Soil Present? Yes ☐ No ☒

Remarks: Potentially contains fill dirt for the existing berm and appears to be an unpaved access.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches):

Water Table Present? Yes ☐ No ☒ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches):

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks: Sampled location does not exhibit hydrological indicators.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: TAL-1147 City/County: King Sampling Date: 10-15-14

Applicant/Owner: Buff Nelson State: Washington Sampling Point: TPC-1

Investigator(s): DRT Section, Township, Range: NW 1/4 Section 8, T25N, R6E

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

Subregion (LRR): A Lat: 47.6692 Long: -122.0735 Datum: NAD83

Soil Map Unit Name: Norma silt loam NWI classification: PEM

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

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

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

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

Remarks: All three required wetland parameters have been met within sampled location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: N/P)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		

Chapter 9.

Sapling/Shrub Stratum (Plot size: N/P)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

Herb Stratum (Plot size: 5 ft)			
1. *Trifolium repens*	20	Yes	FAC
2. *Ranunculus repens*	20	Yes	FAC
3. *Carex sp.*	10		OBL
4. *Poa sp.*	20	Yes	FAC
5. *Agrostis capillaris*	20		FAC
6.			
7.			
8.			
	= Total Cover		

Woody Vine Stratum (Plot size: N/P)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum N/P % Cover of Biotic Crust N/P

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		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

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

☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks:

SOIL

Sampling Point: TPC-1

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/3	100					GSL	
10-18	2.5Y 4/1	80	10YR 4/6	20	C	M	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)
- ☐ 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**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: Hardpan clay

Depth (inches): 18

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks:

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) (**Non riverine**)
- ☐ Sediment Deposits (B2) (**Non riverine**)
- ☐ Drift Deposits (B3) (**Non riverine**)
- ☐ 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 ☒ Depth (inches): -

Water Table Present? Yes ☐ No ☒ Depth (inches): >18

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): >18

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: TAL-1147 City/County: King Sampling Date: 10-15-16

Applicant/Owner: Buff Nelson State: Washington Sampling Point: TPC-2

Investigator(s): DRT Section, Township, Range: NW 1/4 Section 8, T25N, R6E

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

Subregion (LRR): A Lat: 47.6692 Long: -122.0735 Datum: NAD83

Soil Map Unit Name: Norma silt loam NWI classification: N/A

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

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

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

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

Remarks: Soil is a relic hydric soil that has been modified through agriculture and draining. Since the prevailing pattern of vegetation is artificially maintained, it is unreliable as an indicator of wetland conditons. We are basing our decision on whether the test plot is in a wetland or not on the lack of hydrology indicators. Sampled location does not meet all three required wetland parameters.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: N/P)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		

Chapter 10.

Sapling/Shrub Stratum (Plot size: N/P)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

Herb Stratum (Plot size: 5 ft)			
1. *Poa sp*	30	Yes	FAC
2. *Lotus corniculatus*	20	Yes	FAC
3. *Trifolium repens*	10		FAC
4. *Agrostis capillaris*	20	Yes	FAC
5.			
6.			
7.			
8.			
	= Total Cover		

Woody Vine Stratum (Plot size: N/P)			
1.			
2.			
	= Total Cover		

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

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		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

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

☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks:

SOIL

Sampling Point: TPC-2

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/3	100					GSL	
12-18	10YR 3/1	100					GSiL	

[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**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks:

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) (**Non riverine**)
- ☐ Sediment Deposits (B2) (**Non riverine**)
- ☐ Drift Deposits (B3) (**Non riverine**)
- ☐ 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 ☒ Depth (inches): -

Water Table Present? Yes ☐ No ☒ Depth (inches): >18

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): >18

Wetland Hydrology Present? **Yes** ☐ **No** ☒

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

Remarks:

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

Project/Site: TAL-1147 City/County: King Sampling Date: 8-26-14

Applicant/Owner: Buff Nelson State: Washington Sampling Point: TPD-1

Investigator(s): DRT Section, Township, Range: NW 1/4 Section 8, T25N, R6E

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

Subregion (LRR): A Lat: 47.6692 Long: -122.0735 Datum: NAD83

Soil Map Unit Name: Norma Loam NWI classification: PEM

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☐ No ☒

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

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

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

Remarks: Soils did not appear to be hydric by texture or coloration. However, a positive reaction to dipyridyl indicates that anaerobic soil conditions occur. All three required wetland parameters were not met within sampled location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: N/P)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		

Chapter 11.

Sapling/Shrub Stratum (Plot size: N/P)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		

Herb Stratum (Plot size: 5 ft)			
1. *Trifolium repens*	20		FAC
2. *Galium trifidum var. pacificum*	25	Yes	FACW
3. *Juncus effusus*	55	Yes	FACW
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

Woody Vine Stratum (Plot size: N/P)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum N/P % Cover of Biotic Crust N/P

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		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

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

☒ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Site is mowed and grazed. Maintained as pasture.

SOIL

Sampling Point: TPD-1

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 2/2	100					GSiL w. O	Moderate organic content in this layer
10"+	3GY10	100					Cl	

[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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1 (**except MLRA 1**))
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: Clay

Depth (inches): 10"

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks: Positive reaction to dipyridyl. Soil was not saturated, but was moist to within 6 inches of the surface.

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

Project/Site: TAL-1147 City/County: King Sampling Date: 8-26-14

Applicant/Owner: Buff Nelson State: Washington Sampling Point: TPD-2

Investigator(s): DRT Section, Township, Range: NW 1/4 Section 8, T25N, R6E

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

Subregion (LRR): A Lat: 47.6692 Long: -122.0735 Datum: NAD83

Soil Map Unit Name: Norma loam NWI classification: PEM

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

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

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

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

Remarks: All three required wetland parameters have been met within the sampled location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: N/P)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		

Chapter 12.

Sapling/Shrub Stratum (Plot size: N/P)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		

Herb Stratum (Plot size: 5 ft)			
1. *Phalaris arundinacea*	40	Yes	FACW
2. *Trifolium repens*	20		FAC
3. *Juncus effusus*	20		FACW
4. *Galium trifidum var. pacificum*	10		FACW
5.			
6.			
7.			
8.			
	= Total Cover		

Woody Vine Stratum (Plot size: N/P)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum N/P % Cover of Biotic Crust N/P

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		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

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

☒ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Site is maintained as pasture and frequently mowed.

SOIL

Sampling Point: TPD-2

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR 2/2	100					SL	
7"+	10YR 2/1	90	10YR 6/8	10	C	M	GSiL	

[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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1 (**except MLRA 1**))
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 10

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks:

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

Project/Site: TAL-1147 City/County: King Sampling Date: 8-26-14

Applicant/Owner: Buff Nelson State: Washington Sampling Point: TPD-3

Investigator(s): DRT Section, Township, Range: NW 1/4 Section 8, T25N, R6E

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

Subregion (LRR): A Lat: 47.6692 Long: -122.0735 Datum: NAD83

Soil Map Unit Name: Norma loam NWI classification: PEM

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

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

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

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

Remarks: All three required wetland parameters have been met within the sampled location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: N/P)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		

Chapter 13.

Sapling/Shrub Stratum (Plot size: N/P)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		

Herb Stratum (Plot size: 5 ft)			
1. *Holcus lanatus*	30	Yes	FAC
2. *Phalaris arundinacea*	20		FACW
3. *Trifolium repens*	40	Yes	FAC
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

Woody Vine Stratum (Plot size: N/P)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum N/P % Cover of Biotic Crust N/P

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		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

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

☒ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Site is mowed and maintained as pasture.

SOIL

Sampling Point: TPD-3

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/2	100					SiL	
10"+	10YR 2/1	80	10YR 6/8	20	C	M	GSiL	

[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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1 (**except MLRA 1**))
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks:

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

Project/Site: TAL-1147 City/County: King Sampling Date: 8-26-14

Applicant/Owner: Buff Nelson State: Washington Sampling Point: TPD-4

Investigator(s): DRT Section, Township, Range: NW 1/4 Section 8, T25N, R6E

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

Subregion (LRR): A Lat: 47.6692 Long: -122.0735 Datum: NAD83

Soil Map Unit Name: Norma loam NWI classification: PEM

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

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

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

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

Remarks: All three required wetland parameters have been met within the sampled location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		

Chapter 14.

Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		

Herb Stratum (Plot size: _____)			
1. *Trifolium repens*	30	Yes	FAC
2. *Phalaris arundinacea*	30	Yes	FACW
3. *Juncus effusus*	20		FACW
4. *Galium trifidum var. pacificum*	10		FACW
5.			
6.			
7.			
8.			
	= Total Cover		

Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

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

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		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Site is mowed and maintained as pasture.

SOIL

Sampling Point: TPD-4

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/2	100					SiL	
10"+	10YR 3/1	100					VGSL	

[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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1 (**except MLRA 1**))
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 10"

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks:

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

Project/Site: TAL-1147 City/County: King Sampling Date: 8-26-14

Applicant/Owner: Buff Nelson State: Washington Sampling Point: TPD-5

Investigator(s): DRT Section, Township, Range: NW 1/4 Section 8, T25N, R6E

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

Subregion (LRR): A Lat: 47.6692 Long: -122.0735 Datum: NAD83

Soil Map Unit Name: Norma loam NWI classification: N/A

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

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

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

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

Remarks: All three required wetland parameters were not met within the sampled location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: N/P)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		

Chapter 15.

Sapling/Shrub Stratum (Plot size: N/P)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		

Herb Stratum (Plot size: 5 ft)			
1. *Carex sp*	5		OBL
2. *Trifolium repens*	40	Yes	FAC
3. *Poa sp*	30	Yes	FAC
4. *Phalaris arundinacea*	10		FACW
5.			
6.			
7.			
8.			
	= Total Cover		

Woody Vine Stratum (Plot size: N/P)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum N/P % Cover of Biotic Crust N/P

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		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

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

☒ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Site is mowed and maintained as pasture.

SOIL

Sampling Point: TPD-5

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/2	100					SiL	
10"+	10YR 3/2	100					VGSL	

[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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1 (**except MLRA 1**))
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? **Yes** ☐ **No** ☒

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

Remarks:

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

Project/Site: TAL-1147 (Gunshy) City/County: King Sampling Date: 8/26/14

Applicant/Owner: Buff Nelson State: WA Sampling Point: TPE-1

Investigator(s): J. Martin Section, Township, Range: NW 1/4 Section 8, T25N, R6E

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

Subregion (LRR): LRRA Lat: 47.6692 Long: 122.0735 Datum: NAD83

Soil Map Unit Name: Norma Silt Loam NWI classification: N/A

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

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

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

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

Remarks: Sampled location does not meet all three required wetland parameters.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Alnus rubra*	10	No	FAC
2. *Salix scouleriana*	15	No	FAC
3. *Populus balsamifera*	85	Yes	FAC
4. *Fraxinus latifolia*	05	No	FACW
	115	= Total Cover	
Chapter 16. Sapling/Shrub Stratum (Plot size: 15 ft)			
1. *Acer cicinatum*	05	Yes	FAC
2.			
3.			
4.			
5.			
	05	= Total Cover	
Herb Stratum (Plot size: 5 ft)			
1. *Hypochaeris radicata L.*	05	No	FACU
2. *Plantago major*	05	No	FAC
3. *Holcus lanatus*	20	No	FAC
4. *Trifolium pratense*	20	No	FACU
5. *Poa pratensis*	20	No	FAC
6. *Festuca rubra*	70	Yes	FAC
7.			
8.			
	140	= Total Cover	
Woody Vine Stratum (Plot size: N/P)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 0% % Cover of Biotic Crust N/P

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: 1 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	1	x 2 = 2
FAC species	8	x 3 = 24
FACU species	2	x 4 = 8
UPL species	0	x 5 = 0
Column Totals:	11 (A)	26 (B)

Prevalence Index = B/A = 2.36

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☒ Prevalence Index is ≤3.0[1]

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

☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks:

SOIL

Sampling Point: TPE-1

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

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

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1 (**except MLRA 1**))
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: hardpan

Depth (inches): _____

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks: Could not dig deeper in test pit than 16" bgs due to hardpan.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? **Yes** ☐ **No** ☒

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

Remarks:

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

Project/Site: TAL-1147 (Gunshy) City/County: King Sampling Date: 8/27/14

Applicant/Owner: Buff Nelson State: WA Sampling Point: TPE-2

Investigator(s): J. Martin Section, Township, Range: NW 1/4 Section 8, T25N, R6E

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

Subregion (LRR): LRAA Lat: 47.6692 Long: 122.0735 Datum: NAD83

Soil Map Unit Name: Norma Silt Loam NWI classification: PFO/PSS

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

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

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

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

Remarks: All three required wetland parameters have been met within sampled location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus balsamifera*	70	Yes	FAC
2. *Picea sitchensis*	50	Yes	FAC
3. *Fraxinus latifolia*	20	No	FACW
4. *Crataegus douglasii Lindl*	65	Yes	FAC
	205	= Total Cover	

Chapter 17.

Sapling/Shrub Stratum (Plot size: 15-ft)			
1. *Oemleria cerasiformis*	10	No	FACU
2. *Lonicera involucrata (Richardson) Banks ex Spreng.*	20	Yes	FAC
3. *Fraxinus latifolia*	05	No	FACW
4. *Cornus sericeae*	25	Yes	FACW
5. *Salix lucida Muhl. ssp. lasiandra (Benth.)*	10	No	FACW
	70	= Total Cover	

Herb Stratum (Plot size: 05-ft)			
1. *Carex stipata*	15	Yes	OBL
2. *Equisetum telmateia*	05	No	FACW
3. *Luzula parviflora.*	05	No	FAC
4.			
5.			
6.			
7.			
8.			
	25	= Total Cover	

Woody Vine Stratum (Plot size: N/P)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 80% % Cover of Biotic Crust N/P

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 6 (B)

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	1	x 1 = 1
FACW species	5	x 2 = 10
FAC species	5	x 3 = 15
FACU species	1	x 4 = 4
UPL species	0	x 5 = 0
Column Totals:	12 (A)	30 (B)

Prevalence Index = B/A = 2.5

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☒ Prevalence Index is ≤3.0[1]

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

☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks:

SOIL

Sampling Point: TPE-2

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3	--	--	--	--	--	--	--	Duff
3-8	10YR 2/1	100	--	--	--	--	SiLo	
8-13	10YR 2/1	100	--	--	--	--	SiLo	w/ cobble & gravel

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☒ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1 (**except MLRA 1**))
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: shallow aquitard

Depth (inches): 13" bgs

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks:

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

Project/Site: TAL-1147 (Gunshy) City/County: King Sampling Date: 8/26/14

Applicant/Owner: Buff Nelson State: WA Sampling Point: TPE-3

Investigator(s): J. Martin Section, Township, Range: NW 1/4 Section 8, T25N, R6E

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

Subregion (LRR): LRRA Lat: 47.6692 Long: 122.0735 Datum: NAD83

Soil Map Unit Name: Norma Silt Loam NWI classification: N/A

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

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

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

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

Remarks: Does not meet all three required wetland parameters within sampled location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Fraxinus latifolia*	15	Yes	FACW
2. *Populus balsamifera*	20	Yes	FAC
3. *Salix lucida Muhl. ssp. lasiandra (Benth.)*	10	Yes	FACW
4.			
	45	= Total Cover	

Chapter 18.

Sapling/Shrub Stratum (Plot size: 15-ft)			
1. *Cornus sericeae*	05	Yes	FAC
2.			
3.			
4.			
5.			
	05	= Total Cover	

Herb Stratum (Plot size: 5-ft)			
1. *Hypochaeris radicata L.*	05	No	FACU
2. *Plantago major*	05	No	FAC
3. *Holcus lanatus*	05	No	FAC
4. *Lolium perenne*	50	Yes	FAC
5. *Agrostis capillaris*	80	Yes	FAC
6.			
7.			
8.			
	145	= Total Cover	

Woody Vine Stratum (Plot size: N/P)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 0% % Cover of Biotic Crust N/P

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 6 (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	2	x 2 = 4
FAC species	6	x 3 = 18
FACU species	1	x 4 = 4
UPL species	0	x 5 = 0
Column Totals:	09 (A)	26 (B)

Prevalence Index = B/A = 2.88

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☒ Prevalence Index is ≤3.0[1]

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

☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Trees and shrubs not rooted in upland plot yet provide aerial cover

SOIL

Sampling Point: TPE-3

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-07	10YR 3/3	100	--	--	--	--	SiLo	
7-13	10YR 3/3	100	--	--	--	--	SiLo	w/ gravel

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

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

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1 (**except MLRA 1**))
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: hardpan

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☒

Remarks: Could not dig deeper in test pit than 16" bgs due to hardpan.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks:

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

Project/Site: TAL-1147 (Gunshy) City/County: King Sampling Date: 8/27/14

Applicant/Owner: Buff Nelson State: WA Sampling Point: TPE-4

Investigator(s): J. Martin Section, Township, Range: NW 1/4 Section 8, T25N, R6E

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

Subregion (LRR): LRAA Lat: 47.6692 Long: 122.0735 Datum: NAD83

Soil Map Unit Name: Norma Silt Loam NWI classification: PFO/PSS

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

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

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

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

Remarks: All three required wetland parameters have been met within sampled location.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus balsamifera*	20	Yes	FAC
2. *Fraxinus latifolia*	65	Yes	FACW
3.			
4.			
	85 = Total Cover		
Chapter 19. Sapling/Shrub Stratum (Plot size: 15-ft)			
1. *Salix scouleriana*	10	No	FAC
2. *Lonicera involucrata (Richardson) Banks ex Spreng.*	15	Yes	FAC
3. *Salix lucida Muhl. ssp. lasiandra (Benth.)*	10	No	FACW
4. *Cornus sericeae*	35	Yes	FACW
5.			
	70 = Total Cover		
Herb Stratum (Plot size: 05-ft)			
1. *Poa pratensis*	10	Yes	FAC
2. *Carex stipata*	15	Yes	OBL
3. *Luzula parviflora.*	05	No	FAC
4.			
5.			
6.			
7.			
8.			
	30 = Total Cover		
Woody Vine Stratum (Plot size: N/P)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 60% % Cover of Biotic Crust N/P

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 6 (B)

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	1	x 1 = 1
FACW species	3	x 2 = 6
FAC species	5	x 3 = 15
FACU species	0	x 4 = 0
UPL species	0	x 5 = 0
Column Totals:	9 (A)	22 (B)

Prevalence Index = B/A = 2.44

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☒ Prevalence Index is ≤3.0[1]

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

☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Trees and shrubs are rooted within sampled plot

SOIL

Sampling Point: TPE-4

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 2/1	--	--	--	--	--	SiLo	w/ gravel
5-9	10YR 3/1	100	--	--	--	--	SiLo	w/ gravel
9-16	10YR 3/2	50	10YR 8/2-	50	RM	M	Clay	w/ cobble

[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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1 (**except MLRA 1**))
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: shallow aquitard

Depth (inches): 13" bgs

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks:

Appendix E

Wetland Rating Sheets

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Wetland name or number **TAL-1147 Wetland A**

WETLAND RATING FORM – WESTERN WASHINGTON
Version 2 - Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): TAL- 1147 Wetland A Date of site visit: May 18, 2012

Rated by DRT Trained by Ecology? Yes ✕ No___ Date of training 10-05

SEC: 8 TWNSHP: 25N RNGE: 6E Is S/T/R in Appendix D? Yes___ No ✕

Map of wetland unit: Figure ____ Estimated size 8,300 sf

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III___ IV ✕

Category I = Score >=70
Category II = Score 51-69
Category III = Score 30-50
Category IV = Score < 30

Score for Water Quality Functions	4
Score for Hydrologic Functions	4
Score for Habitat Functions	13
TOTAL score for Functions	**21**

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ Does not Apply ✕

Final Category (choose the "highest" category from above) **Cat. IV**

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	✕
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	✕	Check if unit has multiple HGM classes present	

Does the wetland unit being rated meet any of the criteria below?

If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered* ***animal or plant*** *species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.		×
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered* ***animal*** *species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category I Natural Heritage Wetlands (see p. 19 of data form).		×
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*		×
SP4. *Does the wetland unit have a local significance in addition to its functions*? For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.		×

To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Classification of Wetland Units in Western Washington

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 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
×NO go to 2 **YES** the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe NO – Saltwater Tidal Fringe (Estuarine)**

*If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is rated as an **Estuarine** wetland.* Wetlands that were called estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p.).

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
×NO go to 3 **YES** The wetland class is **Flats**

If your wetland can be classified as a "Flats" wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet both** of the following criteria?
___The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) at least 20 acres (8 ha) in size;
___At least 30% of the open water area is deeper than 6.6 ft (2 m)?
× NO go to 4 **YES –** The wetland class is **Lake-fringe (Lacustrine Fringe)**

4. 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**?
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 <3ft diameter and less than 1 foot deep).*
NO - go to 5 ×**YES –** The wetland class is **Slope**

5. 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 two years.

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

×NO - go to 6 **YES** The wetland class is **Riverine**

6. 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 7 **YES –** The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding. The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

×NO go to 8 **YES** The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. 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 1-7 APPLY TO DIFFERENT AREAS IN THE 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 your wetland. 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 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 along stream within boundary	Depressional
Depressional + Lake-fringe	Depressional
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE under wetlands with special characteristics

If you are unable still 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.

S	**Slope Wetlands** WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality	**Points** (only 1 score per box)
S	**S 1. Does the wetland unit have the <u>potential</u> to improve water quality?**	***(see p.64)***
S	S 1.1 Characteristics of average slope of unit: Slope is1% or less *(a 1% slope has a 1 foot vertical drop in elevation for every 100 ft horizontal distance*) points = 3 Slope is 1% - 2% points = 2 Slope is 2% - 5% points = 1 Slope is greater than 5% points = 0	3
S	S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic *(use NRCS definitions)* YES = 3 points NO = 0 points	0
S	S 1.3 Characteristics of the vegetation in the wetland that trap sediments and pollutants: *Choose the points appropriate for the description that best fits the vegetation in the wetland. Dense vegetation means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 inches.* Dense, uncut, herbaceous vegetation > 90% of the wetland area points = 6 Dense, uncut, herbaceous vegetation > 1/2 of area points = 3 Dense, woody, vegetation > ½ of area points = 2 Dense, uncut, herbaceous vegetation > 1/4 of area points = 1 Does not meet any of the criteria above for vegetation points = 0 Aerial photo or map with vegetation polygons	**Figure ___** 1
S	**Total for S 1** *Add the points in the boxes above*	4
S	**S 2. Does the wetland unit have the <u>opportunity</u> to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity*. — Grazing in the wetland or within 150ft — Untreated stormwater discharges to wetland — Tilled fields, logging, or orchards within 150 feet of wetland — Residential, urban areas, or golf courses are within 150 ft upslope of wetland — Other **YES** multiplier is **2** **NO** multiplier is **1**	***(see p.67)*** multiplier 1
S	**TOTAL - Water Quality Functions** Multiply the score from S1 by S2 ***Add score to table on p. 1***	4

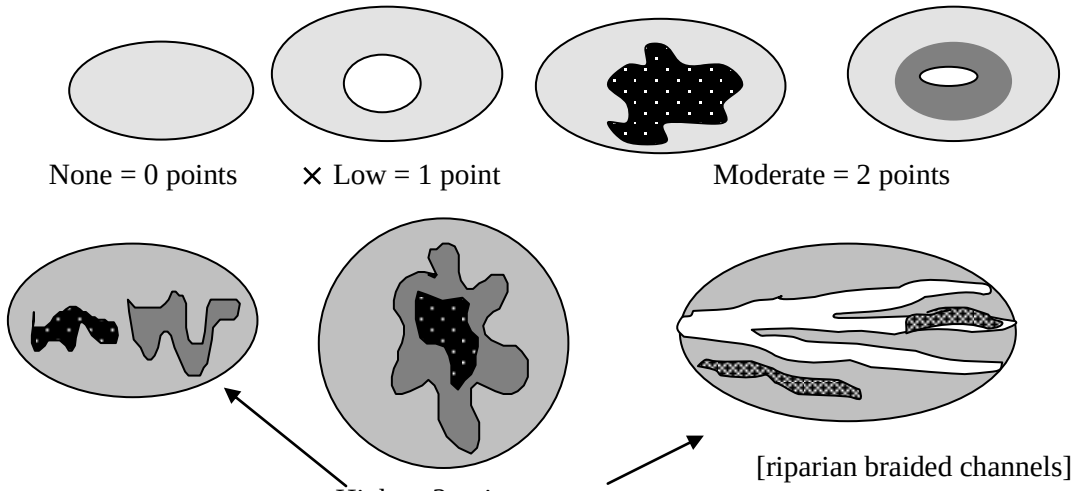
Comments The property is no longer being used for grazing. No other potential sources of pollution were identified within 150 feet of this wetland.

S	**Slope Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream erosion	**Points** (only 1 score per box)
	S 3. Does the wetland unit have the <u>potential</u> to reduce flooding and stream erosion?	***(see p.68)***
S	S 3.1 Characteristics of vegetation that reduce the velocity of surface flows during storms. *Choose the points appropriate for the description that best fit conditions in the wetland. (stems of plants should be thick enough (usually > 1/8in), or dense enough, to remain erect during surface flows)* Dense, uncut, **rigid** vegetation covers > 90% of the area of the wetland. points = 6 Dense, uncut, **rigid** vegetation > 1/2 area of wetland points = 3 Dense, uncut, **rigid** vegetation > 1/4 area points = 1 More than 1/4 of area is grazed, mowed, tilled or vegetation is not rigid points = 0	0
S	S 3.2 Characteristics of slope wetland that holds back small amounts of flood flows: The slope wetland has small surface depressions that can retain water over at least 10% of its area. YES points = 2 NO points = 0	2
S	*Add the points in the boxes above*	2
S	**S 4. Does the wetland have the <u>opportunity</u> to reduce flooding and erosion?** Is the wetland in a landscape position where the reduction in water velocity it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows? *Note which of the following conditions apply.* X Wetland has surface runoff that drains to a river or stream that has flooding problems — Other *(Answer NO if the major source of water is controlled by a reservoir (e.g. wetland is a seep that is on the downstream side of a dam)* **YES** multiplier is **2** **NO** multiplier is **1**	***(see p. 70)*** multiplier 2
S	**TOTAL - Hydrologic Functions** Multiply the score from S 3 by S 4 ***Add score to table on p. 1***	4

Comments Wetland drains to a ditch that eventually flows to Evans Creek. Evans Creek flows through commercially-developed properties and residential areas that could be damaged by flooding.

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit have the <u>potential</u> to provide habitat for many species?	
H 1.1 <u>Vegetation structure</u> ***(see p. 72)*** *Check the types of vegetation classes present (as defined by Cowardin)- Size threshold for each class is ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.* Aquatic bed × Emergent plants Scrub/shrub (areas where shrubs have >30% cover) Forested (areas where trees have >30% cover) *If the unit has a forested class check if:* The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation structures that qualify. If you have:* 4 structures or more points = 4 3 structures points = 2 2 structures points = 1 1 structure points = 0 Map of Cowardin vegetation classes	**Figure ___** 0
H 1.2. <u>Hydroperiods</u> ***(see p. 73)*** *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* Permanently flooded or inundated — 4 or more types present points = 3 Seasonally flooded or inundated — 3 types present points = 2 Occasionally flooded or inundated — 2 types present point = 1 × Saturated only — 1 type present points = 0 × Permanently flowing stream or river in, or adjacent to, the wetland Seasonally flowing stream in, or adjacent to, the wetland ***Lake-fringe wetland* = 2 points** ***Freshwater tidal wetland* = 2 points** Map of hydroperiods	**Figure ___** 1
H 1.3. <u>Richness of Plant Species</u> ***(see p. 75)*** 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, Canadian Thistle* If you counted: > 19 species points = 2 *List species below if you want to:* 5 - 19 species points = 1 Lysichiton americanum, Agrostis tenuis, Poa pratense. < 5 species points = 0 Ranunculus repens, Ranunculus sceleratus, Alnus rubra,	1

Total for page 2

H 1.4. Interspersion of habitats ***(see p. 76)*** Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  None = 0 points × Low = 1 point Moderate = 2 points [riparian braided channels] High = 3 points NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes	**Figure ___** 1
H 1.5. Special Habitat Features: ***(see p. 77)*** *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). Standing snags (diameter at the bottom > 4 inches) in the wetland Undercut banks are present for at least 6.6 ft (2m) and/or overhanging vegetation extends at least 3.3 ft (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft (10m) Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* At least ¼ acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated.*(structures for egg-laying by amphibians)* × Invasive plants cover less than 25% of the wetland area in each stratum of plants *NOTE: The 20% stated in early printings of the manual on page 78 is an error.*	1
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	4

Comments

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
H 2.1 Buffers ***(see p. 80)*** *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."* — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer**.** (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** — 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** × — No paved areas or buildings within 50m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — Heavy grazing in buffer. **Points = 1** — Vegetated buffers are <2m wide (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0**. — Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	**Figure ___** 2
H 2.2 Corridors and Connections ***(see p. 81)*** H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft wide, has at least 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? (*dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor*). YES = **4 points** (*go to H 2.3*) NO = go to H 2.2.2 H 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** (*go to H 2.3*) NO = H 2.2.3 H 2.2.3 Is the wetland: within 5 mi (8km) of a brackish or salt water estuary OR within 3 mi of a large field or pasture (>40 acres) OR × within 1 mi of a lake greater than 20 acres? × YES = **1 point** NO = **0 points**	1

Total for page 3

H 2.3 Near or adjacent to other priority habitats listed by WDFW ***(see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report http://wdfw.wa.gov/hab/phslist.htm)*** Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* ____**Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre). ____**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 p. 152*). ____**Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock. ____**Old-growth/Mature forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age. **(**Mature forests) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 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 of the Cascade crest. _**Oregon white Oak:** Woodlands 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*). × **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other. ____**Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161*). × **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. ____ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report: pp. 167-169 and glossary in Appendix A).* **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 7.6 m (25 ft) high and occurring below 5000 ft. ____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), 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 > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long. If wetland has **3 or more** priority habitats **= 4 points** If wetland has **2** priority habitats = **3 points** If wetland has **1** priority habitat **= 1 point** No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	3

H 2.4 Wetland Landscape *(choose the **one** description of the landscape around the wetland that best fits)* ***(see p. 84)*** There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 There is at least 1 wetland within ½ mile. points = 2 There are no wetlands within ½ mile. points = 0	3
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	9
TOTAL for H 1 from page 14	4
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	**13**

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate answers and Category.

Wetland Type *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	**Category**
SC 1.0 Estuarine wetlands *(see p. 86)* Does the wetland unit meet the following criteria for Estuarine wetlands? — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt. YES Go to SC 1.1 NO ×_	
SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? YES Category I NO go to SC 1.2	**Cat. I**
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three conditions? YES Category I NO Category II — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native *Spartina* spp. are the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** **Cat. II** **Dual rating I/II**

SC 2.0 Natural Heritage Wetlands ***(see p. 87)*** Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? *(this question is used to screen out most sites before you need to contact WNHP/DNR)* S/T/R information from Appendix D or accessed from WNHP/DNR web site YES____ contact WNHP/DNR (see p. 79) and go to SC 2.2 NO × SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? YES Category I NO ×not a Heritage Wetland	**Cat. I**
SC 3.0 Bogs ***(see p. 87)*** Does the wetland unit (**or any part of the unit**) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 × No - go to Q. 2 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? Yes - go to Q. 3 × No - Is not a bog for purpose of rating 3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)? Yes Is a bog for purpose of rating × No - go to Q. 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" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. YES Category I No× Is not a bog for purpose of rating	**Cat. I**

SC 4.0 Forested Wetlands *(see p. 90)* Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *If you answer yes you will still need to rate the wetland based on its functions.* — **Old-growth forests**: (west of Cascade crest) Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm) or more. NOTE: The criterion for dbh is based on measurements for upland forests. Two-hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The DFW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter. — **Mature forests**: (west of the Cascade Crest) Stands where the largest trees are 80 200 years old OR have average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth. YES = Category I NO × not a forested wetland with special characteristics	**Cat. I**
SC 5.0 Wetlands in Coastal Lagoons *(see p. 91)* Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks — The lagoon in which the wetland is located contains surface water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* YES Go to SC 5.1 NO_×_ not a wetland in a coastal lagoon SC 5.1 Does the wetland meets all of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of invasive plant species (see list of invasive species on p. 74). — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland is larger than 1/10 acre (4350 square feet) YES Category I NO Category II	**Cat. I** **Cat. II**

SC 6.0 Interdunal Wetlands ***(see p. 93)*** Is the wetland unit west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? YES - go to SC 6.1 NO ✕ not an interdunal wetland for rating ***If you answer yes you will still need to rate the wetland based on its functions.*** In practical terms that means the following geographic areas: • Long Beach Peninsula- lands west of SR 103 • Grayland-Westport- lands west of SR 105 • Ocean Shores-Copalis- lands west of SR 115 and SR 109 SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is once acre or larger? YES Category II NO go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? YES Category III	**Cat. II** **Cat. III**
Category of wetland based on Special Characteristics *Choose the "highest" rating if wetland falls into several categories, and record on p. 1.* If you answered NO for all types enter "Not Applicable" on p.1	**NA**

Wetland name or number **TAL-1147 Wetland B**

WETLAND RATING FORM – WESTERN WASHINGTON
Version 2 - Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): TAL-1147 Wetland B Date of site visit: 08-26-14

Rated by DRT Trained by Ecology? Yes ✓ No___ Date of training 10-05

SEC: 8 TWNSHP: 25N RNGE: 6E Is S/T/R in Appendix D? Yes___ No ✓

Map of wetland unit: Figure ____ Estimated size _____

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I ✓ II___ III___ IV___

Category I Score > 70
Category II Score 51-69
Category III Score 30-50
Category IV Score < 30

Score for Water Quality Functions	28
Score for Hydrologic Functions	12
Score for Habitat Functions	31
TOTAL score for Functions	**71**

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ Does not Apply ✓

Final Category (choose the "highest" category from above) **Cat. I**

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	✓
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	✓	Check if unit has multiple HGM classes present	

Does the wetland unit being rated meet any of the criteria below?

If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered* ***animal or plant*** *species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.		✓
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered* ***animal*** *species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category I Natural Heritage Wetlands (see p. 19 of data form).		✓
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*	✓	
SP4. *Does the wetland unit have a local significance in addition to its functions*? For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.	✓	

To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Wetland name or number **TAL-1147 Wetland B**

Classification of Wetland Units in Western Washington

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 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
✓ NO go to 2 **YES** the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe NO – Saltwater Tidal Fringe (Estuarine)**

*If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is rated as an **Estuarine** wetland.* Wetlands that were called estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p.).

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
✓ NO go to 3 **YES** The wetland class is **Flats**

If your wetland can be classified as a "Flats" wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet both** of the following criteria?
___The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) at least 20 acres (8 ha) in size;
___At least 30% of the open water area is deeper than 6.6 ft (2 m)?
✓ NO go to 4 **YES –** The wetland class is **Lake-fringe (Lacustrine Fringe)**

4. 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**?
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 <3ft diameter and less than 1 foot deep).*
✓ NO - go to 5 **YES –** The wetland class is **Slope**

5. 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 two years.

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

✓ NO - go to 6 **YES** The wetland class is **Riverine**

6. 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 7 ✓ **YES –** The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding. The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

✓ NO go to 8 **YES** The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. 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 1-7 APPLY TO DIFFERENT AREAS IN THE 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 your wetland. 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 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 along stream within boundary	Depressional
Depressional + Lake-fringe	Depressional
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE under wetlands with special characteristics

If you are unable still 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 **TAL-1147 Wetland B**

D	**Depressional and Flats Wetlands** **WATER QUALITY FUNCTIONS** - Indicators that the wetland unit functions to improve water quality	**Points** (only 1 score per box)
D	**D 1. Does the wetland unit have the <u>potential</u> to improve water quality?**	***(see p.38)***
D	D 1.1 Characteristics of surface water flows out of the wetland: Unit is a depression with no surface water leaving it (no outlet) points = 3 Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2 Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) points = 1 Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch points = 1 (*If ditch is not permanently flowing treat unit as "intermittently flowing"*) Provide photo or drawing	**Figure ___** 1
D	S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic *(use NRCS definitions)* YES points = 4 NO points = 0	4
D	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class) Wetland has persistent, ungrazed, vegetation > = 95% of area points = 5 Wetland has persistent, ungrazed, vegetation > = 1/2 of area points = 3 Wetland has persistent, ungrazed vegetation > = 1/10 of area points = 1 Wetland has persistent, ungrazed vegetation <1/10 of area points = 0 Map of Cowardin vegetation classes	**Figure ___** 5
D	D1.4 Characteristics of seasonal ponding or inundation. *This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.* Area seasonally ponded is > ½ total area of wetland points = 4 Area seasonally ponded is > ¼ total area of wetland points = 2 Area seasonally ponded is < ¼ total area of wetland points = 0 Map of Hydroperiods	**Figure ___** 4
D	**Total for D 1** *Add the points in the boxes above*	14
D	**D 2. Does the wetland unit have the <u>opportunity</u> to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* — Grazing in the wetland or within 150 ft — Untreated stormwater discharges to wetland — Tilled fields or orchards within 150 ft of wetland ✓ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging ✓ Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other **YES** multiplier is **2** **NO** multiplier is **1**	***(see p. 44)*** multiplier 2
D	**<u>TOTAL</u> - Water Quality Functions** Multiply the score from D1 by D2 ***Add score to table on p. 1***	28

Comments:

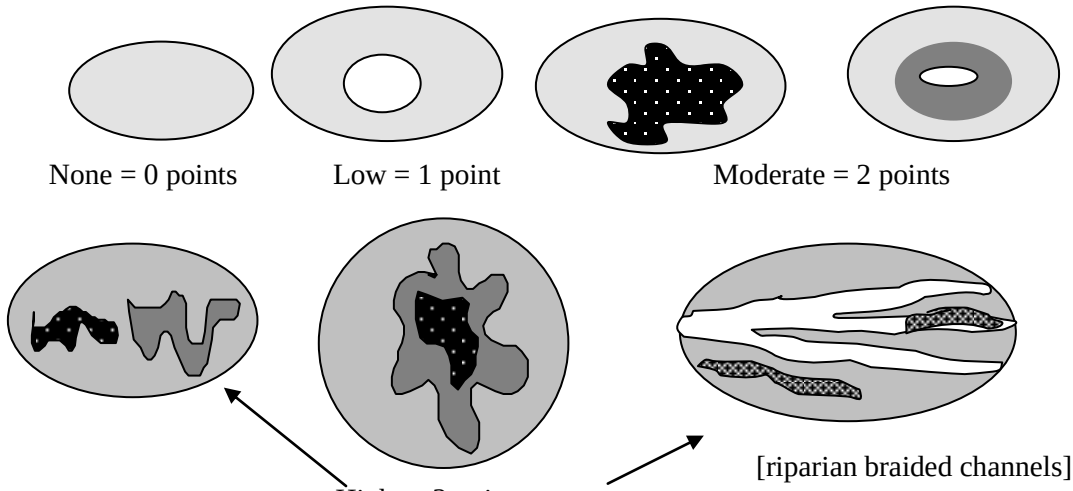
Wetland name or number TAL-1147 Wetland B

D	**Depressional and Flats Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation	**Points** (only 1 score per box)
	D 3. Does the wetland unit have the <u>potential</u> to reduce flooding and erosion?	***(see p.46)***
D	D 3.1 Characteristics of surface water flows out of the wetland unit Unit is a depression with no surface water leaving it (no outlet) points = 4 Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2 Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch points = 1 (*If ditch is not permanently flowing treat unit as "intermittently flowing"*) Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) points = 0	0
D	D 3.2 Depth of storage during wet periods *Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).* Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7 The wetland is a "headwater" wetland" points = 5 Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5 Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3 Unit is flat (yes to Q. 2 or Q. 7 on key) but has small depressions on the surface that trap water points = 1 Marks of ponding less than 0.5 ft points = 0	3
D	D 3.3 Contribution of wetland unit to storage in the watershed *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* The area of the basin is less than 10 times the area of unit points = 5 The area of the basin is 10 to 100 times the area of the unit points = 3 The area of the basin is more than 100 times the area of the unit points = 0 Entire unit is in the FLATS class points = 5	3
D	**Total for D 3** *Add the points in the boxes above*	6
D	**D 4. Does the wetland unit have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* — Wetland is in a headwater of a river or stream that has flooding problems ✓ Wetland drains to a river or stream that has flooding problems — Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems — Other **YES** multiplier is **2** **NO** multiplier is **1**	***(see p. 49)*** multiplier 2
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 ***Add score to table on p. 1***	**12**

Comments:

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit have the <u>potential</u> to provide habitat for many species?	
H 1.1 <u>Vegetation structure</u> ***(see p. 72)*** *Check the types of vegetation classes present (as defined by Cowardin)- Size threshold for each class is ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.* ✓ Aquatic bed ✓ Emergent plants ✓ Scrub/shrub (areas where shrubs have >30% cover) ✓ Forested (areas where trees have >30% cover) *If the unit has a forested class check if:* ✓ The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation structures that qualify. If you have:* 4 structures or more points = 4 3 structures points = 2 2 structures points = 1 1 structure points = 0 Map of Cowardin vegetation classes	**Figure ___** 4
H 1.2. <u>Hydroperiods</u> ***(see p. 73)*** *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ✓ Permanently flooded or inundated — 4 or more types present points = 3 ✓ Seasonally flooded or inundated — 3 types present points = 2 Occasionally flooded or inundated — 2 types present point = 1 ✓ Saturated only — 1 type present points = 0 ✓ Permanently flowing stream or river in, or adjacent to, the wetland Seasonally flowing stream in, or adjacent to, the wetland ***Lake-fringe wetland* = 2 points** ***Freshwater tidal wetland* = 2 points** Map of hydroperiods	**Figure ___** 3
H 1.3. <u>Richness of Plant Species</u> ***(see p. 75)*** 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, Canadian Thistle* If you counted: > 19 species points = 2 *List species below if you want to:* 5 - 19 species points = 1 < 5 species points = 0	2

Total for page 9

H 1.4. Interspersion of habitats ***(see p. 76)*** Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  None = 0 points Low = 1 point Moderate = 2 points High = 3 points [riparian braided channels] NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes	**Figure ___** 3
H 1.5. Special Habitat Features: ***(see p. 77)*** *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ✓ Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). ✓ Standing snags (diameter at the bottom > 4 inches) in the wetland ✓ Undercut banks are present for at least 6.6 ft (2m) and/or overhanging vegetation extends at least 3.3 ft (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft (10m) ✓ Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* ✓ At least ¼ acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated.*(structures for egg-laying by amphibians)* ✓ Invasive plants cover less than 25% of the wetland area in each stratum of plants *NOTE: The 20% stated in early printings of the manual on page 78 is an error.*	6
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	18

Comments

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
H 2.1 Buffers ***(see p. 80)*** *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."* — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer**.** (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** — 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** ✓ — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — No paved areas or buildings within 50m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — Heavy grazing in buffer. **Points = 1** — Vegetated buffers are <2m wide (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0**. — Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	**Figure ___** 2
H 2.2 Corridors and Connections ***(see p. 81)*** H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft wide, has at least 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? (*dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor*). YES = **4 points** (*go to H 2.3*) NO = go to H 2.2.2 H 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? ✓ YES = **2 points** (*go to H 2.3*) NO = H 2.2.3 H 2.2.3 Is the wetland: within 5 mi (8km) of a brackish or salt water estuary OR within 3 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? YES = **1 point** NO = **0 points**	2

Total for page 4

H 2.3 Near or adjacent to other priority habitats listed by WDFW ***(see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report http://wdfw.wa.gov/hab/phslist.htm)*** Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* ____**Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre). ✓ **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 p. 152*). ____**Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock. ____**Old-growth/Mature forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age. **(**Mature forests) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 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 of the Cascade crest. _**Oregon white Oak:** Woodlands 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*). ✓ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other. ____**Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161*). ✓ **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. ____ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report: pp. 167-169 and glossary in Appendix A).* **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 7.6 m (25 ft) high and occurring below 5000 ft. ____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), 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 > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long. If wetland has **3 or more** priority habitats **= 4 points** If wetland has **2** priority habitats = **3 points** If wetland has **1** priority habitat **= 1 point** No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	4

H 2.4 Wetland Landscape *(choose the **one** description of the landscape around the wetland that best fits)* ***(see p. 84)*** There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 There is at least 1 wetland within ½ mile. points = 2 There are no wetlands within ½ mile. points = 0	5
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	13
TOTAL for H 1 from page 14	18
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	**31**

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate answers and Category.

Wetland Type *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	**Category**
SC 1.0 Estuarine wetlands ***(see p. 86)*** Does the wetland unit meet the following criteria for Estuarine wetlands? — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt. YES Go to SC 1.1 NO ✓	
SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? YES Category I NO go to SC 1.2	
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three conditions? YES Category I NO Category II — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native *Spartina* spp. are the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**No**

SC 2.0 Natural Heritage Wetlands ***(see p. 87)*** Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? *(this question is used to screen out most sites before you need to contact WNHP/DNR)* S/T/R information from Appendix D or accessed from WNHP/DNR web site YES____ contact WNHP/DNR (see p. 79) and go to SC 2.2 NO ___ SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? YES Category I NO _✕_not a Heritage Wetland	No
SC 3.0 Bogs ***(see p. 87)*** Does the wetland unit (**or any part of the unit**) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 No - go to Q. 2 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? Yes - go to Q. 3 No - Is not a bog for purpose of rating 3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)? Yes Is a bog for purpose of rating ✓ No - go to Q. 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" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. YES Category I No_✓_ Is not a bog for purpose of rating	No

SC 4.0 Forested Wetlands *(see p. 90)* Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *If you answer yes you will still need to rate the wetland based on its functions.* — **Old-growth forests**: (west of Cascade crest) Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm) or more. NOTE: The criterion for dbh is based on measurements for upland forests. Two-hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The DFW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter. — **Mature forests**: (west of the Cascade Crest) Stands where the largest trees are 80 200 years old OR have average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth. YES = Category I NO ✓ not a forested wetland with special characteristics	No
SC 5.0 Wetlands in Coastal Lagoons *(see p. 91)* Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks — The lagoon in which the wetland is located contains surface water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* YES Go to SC 5.1 NO_✓_ not a wetland in a coastal lagoon SC 5.1 Does the wetland meets all of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of invasive plant species (see list of invasive species on p. 74). — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland is larger than 1/10 acre (4350 square feet) YES Category I NO Category II	No

SC 6.0 Interdunal Wetlands ***(see p. 93)*** Is the wetland unit west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? YES - go to SC 6.1 NO ✓ not an interdunal wetland for rating ***If you answer yes you will still need to rate the wetland based on its functions.*** In practical terms that means the following geographic areas: • Long Beach Peninsula- lands west of SR 103 • Grayland-Westport- lands west of SR 105 • Ocean Shores-Copalis- lands west of SR 115 and SR 109 SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is once acre or larger? YES Category II NO go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? YES Category III	No
Category of wetland based on Special Characteristics *Choose the "highest" rating if wetland falls into several categories, and record on p. 1.* If you answered NO for all types enter "Not Applicable" on p.1	**NA**

Wetland name or number **TAL-1147 Wetland C**

WETLAND RATING FORM – WESTERN WASHINGTON
Version 2 - Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): TAL-1147 Wetland C Date of site visit: 08-26-14

Rated by DRT Trained by Ecology? Yes ✓ No___ Date of training 10-05

SEC: 8 TWNSHP: 25N RNGE: 6E Is S/T/R in Appendix D? Yes___ No ✓

Map of wetland unit: Figure ____ Estimated size 8,298 sf

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III ✓ IV___

Category I = Score >=70
Category II = Score 51-69
Category III = Score 30-50
Category IV = Score < 30

Score for Water Quality Functions	16
Score for Hydrologic Functions	16
Score for Habitat Functions	9
TOTAL score for Functions	**41**

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ Does not Apply ✓

Final Category (choose the "highest" category from above) **Cat. III**

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	✓
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	✓	Check if unit has multiple HGM classes present	

Does the wetland unit being rated meet any of the criteria below?

If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered* ***animal or plant*** *species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.		✓
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered* ***animal*** *species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category I Natural Heritage Wetlands (see p. 19 of data form).		✓
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*		✓
SP4. *Does the wetland unit have a local significance in addition to its functions*? For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.		✓

To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Wetland name or number **TAL-1147 Wetland C**

Classification of Wetland Units in Western Washington

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 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
✓ NO go to 2 **YES** the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe NO – Saltwater Tidal Fringe (Estuarine)**

*If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is rated as an **Estuarine** wetland.* Wetlands that were called estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p.).

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
✓ NO go to 3 **YES** The wetland class is **Flats**

If your wetland can be classified as a "Flats" wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet both** of the following criteria?
___The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) at least 20 acres (8 ha) in size;
___At least 30% of the open water area is deeper than 6.6 ft (2 m)?
✓ NO go to 4 **YES –** The wetland class is **Lake-fringe (Lacustrine Fringe)**

4. 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**?
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 <3ft diameter and less than 1 foot deep).*
NO - go to 5 ✓ **YES –** The wetland class is **Slope**

5. 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 two years.

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

✓ NO - go to 6 **YES** The wetland class is **Riverine**

6. 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 7 **YES –** The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding. The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

✓ NO go to 8 **YES** The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. 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 1-7 APPLY TO DIFFERENT AREAS IN THE 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 your wetland. 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 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 along stream within boundary	Depressional
Depressional + Lake-fringe	Depressional
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE under wetlands with special characteristics

If you are unable still 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.

S	**Slope Wetlands** WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality	**Points** (only 1 score per box)
S	**S 1. Does the wetland unit have the <u>potential</u> to improve water quality?**	***(see p.64)***
S	S 1.1 Characteristics of average slope of unit: Slope is1% or less *(a 1% slope has a 1 foot vertical drop in elevation for every 100 ft horizontal distance*) points = 3 Slope is 1% - 2% points = 2 Slope is 2% - 5% points = 1 Slope is greater than 5% points = 0	2
S	S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic *(use NRCS definitions)* YES = 3 points NO = 0 points	0
S	S 1.3 Characteristics of the vegetation in the wetland that trap sediments and pollutants: *Choose the points appropriate for the description that best fits the vegetation in the wetland. Dense vegetation means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 inches.* Dense, uncut, herbaceous vegetation > 90% of the wetland area points = 6 Dense, uncut, herbaceous vegetation > 1/2 of area points = 3 Dense, woody, vegetation > ½ of area points = 2 Dense, uncut, herbaceous vegetation > 1/4 of area points = 1 Does not meet any of the criteria above for vegetation points = 0 Aerial photo or map with vegetation polygons	**Figure ___** 6
S	**Total for S 1** *Add the points in the boxes above*	8
S	**S 2. Does the wetland unit have the <u>opportunity</u> to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity*. — Grazing in the wetland or within 150ft — Untreated stormwater discharges to wetland ✓ Tilled fields, logging, or orchards within 150 feet of wetland ✓ Residential, urban areas, or golf courses are within 150 ft upslope of wetland — Other **YES** multiplier is **2** **NO** multiplier is **1**	***(see p.67)*** multiplier 2
S	**TOTAL - Water Quality Functions** Multiply the score from S1 by S2 ***Add score to table on p. 1***	16

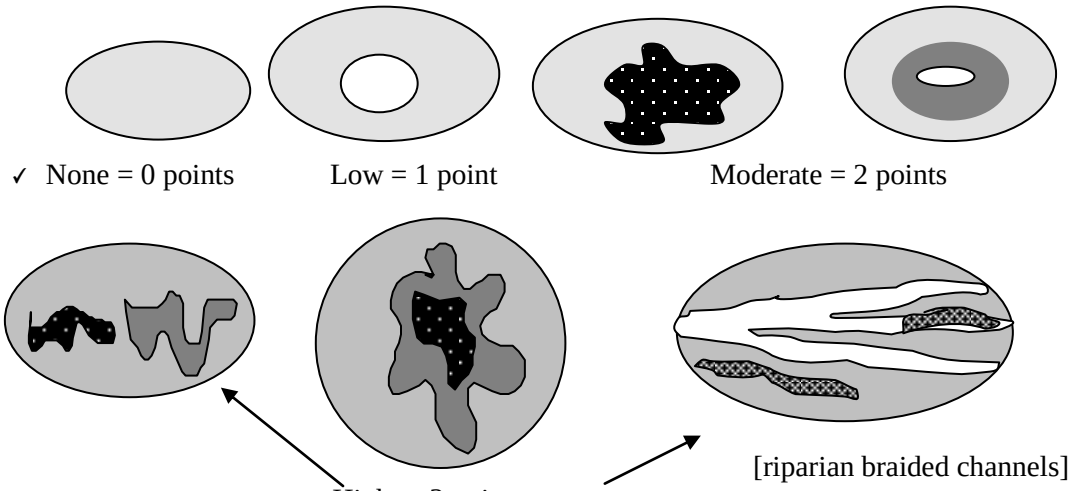
Comments

S	**Slope Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream erosion	**Points** (only 1 score per box)
	S 3. Does the wetland unit have the <u>potential</u> to reduce flooding and stream erosion?	***(see p.68)***
S	S 3.1 Characteristics of vegetation that reduce the velocity of surface flows during storms. *Choose the points appropriate for the description that best fit conditions in the wetland. (stems of plants should be thick enough (usually > 1/8in), or dense enough, to remain erect during surface flows)* Dense, uncut, **rigid** vegetation covers > 90% of the area of the wetland. points = 6 Dense, uncut, **rigid** vegetation > 1/2 area of wetland points = 3 Dense, uncut, **rigid** vegetation > 1/4 area points = 1 More than 1/4 of area is grazed, mowed, tilled or vegetation is not rigid points = 0	6
S	S 3.2 Characteristics of slope wetland that holds back small amounts of flood flows: The slope wetland has small surface depressions that can retain water over at least 10% of its area. YES points = 2 NO points = 0	2
S	*Add the points in the boxes above*	8
S	**S 4. Does the wetland have the <u>opportunity</u> to reduce flooding and erosion?** Is the wetland in a landscape position where the reduction in water velocity it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows? *Note which of the following conditions apply.* ✓ Wetland has surface runoff that drains to a river or stream that has flooding problems — Other *(Answer NO if the major source of water is controlled by a reservoir (e.g. wetland is a seep that is on the downstream side of a dam)* **YES** multiplier is **2** **NO** multiplier is **1**	***(see p. 70)*** multiplier 2
S	**TOTAL - Hydrologic Functions** Multiply the score from S 3 by S 4 ***Add score to table on p. 1***	16

Comments

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit have the <u>potential</u> to provide habitat for many species?	
H 1.1 <u>Vegetation structure</u> ***(see p. 72)*** *Check the types of vegetation classes present (as defined by Cowardin)- Size threshold for each class is ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.* Aquatic bed ✓ Emergent plants Scrub/shrub (areas where shrubs have >30% cover) Forested (areas where trees have >30% cover) *If the unit has a forested class check if:* The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation structures that qualify. If you have:* 4 structures or more points = 4 3 structures points = 2 2 structures points = 1 1 structure points = 0 Map of Cowardin vegetation classes	**Figure ___** 0
H 1.2. <u>Hydroperiods</u> ***(see p. 73)*** *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* Permanently flooded or inundated — 4 or more types present points = 3 ✓ Seasonally flooded or inundated — 3 types present points = 2 Occasionally flooded or inundated — 2 types present point = 1 ✓ Saturated only — 1 type present points = 0 Permanently flowing stream or river in, or adjacent to, the wetland Seasonally flowing stream in, or adjacent to, the wetland ***Lake-fringe wetland* = 2 points** ***Freshwater tidal wetland* = 2 points** Map of hydroperiods	**Figure ___** 1
H 1.3. <u>Richness of Plant Species</u> ***(see p. 75)*** 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, Canadian Thistle* If you counted: > 19 species points = 2 *List species below if you want to:* 5 - 19 species points = 1 < 5 species points = 0	1

Total for page 2

H 1.4. Interspersion of habitats ***(see p. 76)*** Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  ✓ None = 0 points Low = 1 point Moderate = 2 points High = 3 points [riparian braided channels] NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes	**Figure ___** 0
H 1.5. Special Habitat Features: ***(see p. 77)*** *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). Standing snags (diameter at the bottom > 4 inches) in the wetland Undercut banks are present for at least 6.6 ft (2m) and/or overhanging vegetation extends at least 3.3 ft (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft (10m) Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* At least ¼ acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated.*(structures for egg-laying by amphibians)* Invasive plants cover less than 25% of the wetland area in each stratum of plants *NOTE: The 20% stated in early printings of the manual on page 78 is an error.*	0
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	2

Comments

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
H 2.1 Buffers ***(see p. 80)*** *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."* — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer**.** (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** — 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — No paved areas or buildings within 50m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — Heavy grazing in buffer. **Points = 1** — Vegetated buffers are <2m wide (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0**. ✓ Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	**Figure ___** 1
H 2.2 Corridors and Connections ***(see p. 81)*** H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft wide, has at least 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? (*dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor*). YES = **4 points** (*go to H 2.3*) NO = go to H 2.2.2 H 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** (*go to H 2.3*) NO = H 2.2.3 H 2.2.3 Is the wetland: within 5 mi (8km) of a brackish or salt water estuary OR within 3 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? YES = **1 point** ✓ NO = **0 points**	0

Total for page 1

H 2.3 Near or adjacent to other priority habitats listed by WDFW ***(see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report http://wdfw.wa.gov/hab/phslist.htm)*** Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* ____**Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre). ____**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 p. 152*). ____**Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock. ____**Old-growth/Mature forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age. **(**Mature forests) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 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 of the Cascade crest. _**Oregon white Oak:** Woodlands 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*). ✓ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other. ____**Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161*). ✓ **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. ____ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report: pp. 167-169 and glossary in Appendix A).* **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 7.6 m (25 ft) high and occurring below 5000 ft. ____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), 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 > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long. If wetland has **3 or more** priority habitats **= 4 points** If wetland has **2** priority habitats = **3 points** If wetland has **1** priority habitat **= 1 point** No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	3

H 2.4 Wetland Landscape *(choose the **one** description of the landscape around the wetland that best fits)* ***(see p. 84)*** There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 There is at least 1 wetland within ½ mile. points = 2 There are no wetlands within ½ mile. points = 0	3
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	7
TOTAL for H 1 from page 14	2
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	**9**

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate answers and Category.

Wetland Type *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	**Category**
SC 1.0 Estuarine wetlands ***(see p. 86)*** Does the wetland unit meet the following criteria for Estuarine wetlands? — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt. YES Go to SC 1.1 NO ✓	
SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? YES Category I NO go to SC 1.2	
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three conditions? YES Category I NO Category II — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native *Spartina* spp. are the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**No**

SC 2.0 Natural Heritage Wetlands ***(see p. 87)*** Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? *(this question is used to screen out most sites before you need to contact WNHP/DNR)* S/T/R information from Appendix D or accessed from WNHP/DNR web site YES____ contact WNHP/DNR (see p. 79) and go to SC 2.2 NO ___ SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? YES Category I NO __✕__not a Heritage Wetland	No
SC 3.0 Bogs ***(see p. 87)*** Does the wetland unit (**or any part of the unit**) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 No - go to Q. 2 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? Yes - go to Q. 3 ✓ No - Is not a bog for purpose of rating 3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)? Yes Is a bog for purpose of rating ✓ No - go to Q. 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" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. YES Category I No__✓__ Is not a bog for purpose of rating	No

SC 4.0 Forested Wetlands *(see p. 90)* Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *If you answer yes you will still need to rate the wetland based on its functions.* — **Old-growth forests**: (west of Cascade crest) Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm) or more. NOTE: The criterion for dbh is based on measurements for upland forests. Two-hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The DFW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter. — **Mature forests**: (west of the Cascade Crest) Stands where the largest trees are 80 200 years old OR have average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth. YES = Category I NO ✓ not a forested wetland with special characteristics	No
SC 5.0 Wetlands in Coastal Lagoons *(see p. 91)* Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks — The lagoon in which the wetland is located contains surface water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* YES Go to SC 5.1 NO_✓_ not a wetland in a coastal lagoon SC 5.1 Does the wetland meets all of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of invasive plant species (see list of invasive species on p. 74). — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland is larger than 1/10 acre (4350 square feet) YES Category I NO Category II	No

SC 6.0 Interdunal Wetlands ***(see p. 93)*** Is the wetland unit west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? YES - go to SC 6.1 NO ✓ not an interdunal wetland for rating ***If you answer yes you will still need to rate the wetland based on its functions.*** In practical terms that means the following geographic areas: • Long Beach Peninsula- lands west of SR 103 • Grayland-Westport- lands west of SR 105 • Ocean Shores-Copalis- lands west of SR 115 and SR 109 SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is once acre or larger? YES Category II NO go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? YES Category III	No
Category of wetland based on Special Characteristics *Choose the "highest" rating if wetland falls into several categories, and record on p. 1.* If you answered NO for all types enter "Not Applicable" on p.1	**NA**

Wetland name or number TAL-1147 Wetland D

WETLAND RATING FORM – WESTERN WASHINGTON
Version 2 - Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): TAL-1147 Wetland D Date of site visit: 08-26-14

Rated by DRT Trained by Ecology? Yes ✓ No___ Date of training 10-05

SEC: 8 TWNSHP: 25N RNGE: 6E Is S/T/R in Appendix D? Yes___ No ✓

Map of wetland unit: Figure ____ Estimated size 40,833

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III ✓ IV___

Category I = Score >=70
Category II = Score 51-69
Category III = Score 30-50
Category IV = Score < 30

Score for Water Quality Functions	8
Score for Hydrologic Functions	12
Score for Habitat Functions	10
TOTAL score for Functions	**30**

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ Does not Apply ✓

Final Category (choose the "highest" category from above) **Cat. III**

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	✓
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	✓	Check if unit has multiple HGM classes present	

Does the wetland unit being rated meet any of the criteria below?

If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered* ***animal or plant*** *species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.		✓
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered* ***animal*** *species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category I Natural Heritage Wetlands (see p. 19 of data form).		✓
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*		✓
SP4. *Does the wetland unit have a local significance in addition to its functions*? For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.		✓

To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Wetland name or number **TAL-1147 Wetland D**

Classification of Wetland Units in Western Washington

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 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
✓ NO go to 2 **YES** the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe NO – Saltwater Tidal Fringe (Estuarine)**

*If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is rated as an **Estuarine** wetland.* Wetlands that were called estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p.).

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
✓ NO go to 3 **YES** The wetland class is **Flats**

If your wetland can be classified as a "Flats" wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet both** of the following criteria?
___The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) at least 20 acres (8 ha) in size;
___At least 30% of the open water area is deeper than 6.6 ft (2 m)?
✓ NO go to 4 **YES –** The wetland class is **Lake-fringe (Lacustrine Fringe)**

4. 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**?
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 <3ft diameter and less than 1 foot deep).*
NO - go to 5 ✓ **YES –** The wetland class is **Slope**

5. 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 two years.

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

✓ NO - go to 6 **YES** The wetland class is **Riverine**

6. 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 7 **YES –** The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding. The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

✓ NO go to 8 **YES** The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. 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 1-7 APPLY TO DIFFERENT AREAS IN THE 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 your wetland. 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 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 along stream within boundary	Depressional
Depressional + Lake-fringe	Depressional
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE under wetlands with special characteristics

If you are unable still 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.

S	**Slope Wetlands** WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality	**Points** (only 1 score per box)
S	**S 1. Does the wetland unit have the <u>potential</u> to improve water quality?**	***(see p.64)***
S	S 1.1 Characteristics of average slope of unit: Slope is1% or less *(a 1% slope has a 1 foot vertical drop in elevation for every 100 ft horizontal distance*) points = 3 Slope is 1% - 2% points = 2 Slope is 2% - 5% points = 1 Slope is greater than 5% points = 0	2
S	S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic *(use NRCS definitions)* YES = 3 points NO = 0 points	0
S	S 1.3 Characteristics of the vegetation in the wetland that trap sediments and pollutants: *Choose the points appropriate for the description that best fits the vegetation in the wetland. Dense vegetation means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 inches.* Dense, uncut, herbaceous vegetation > 90% of the wetland area points = 6 Dense, uncut, herbaceous vegetation > 1/2 of area points = 3 Dense, woody, vegetation > ½ of area points = 2 Dense, uncut, herbaceous vegetation > 1/4 of area points = 1 Does not meet any of the criteria above for vegetation points = 0 Aerial photo or map with vegetation polygons	**Figure ___** 6
S	**Total for S 1** *Add the points in the boxes above*	8
S	**S 2. Does the wetland unit have the <u>opportunity</u> to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity*. — Grazing in the wetland or within 150ft — Untreated stormwater discharges to wetland — Tilled fields, logging, or orchards within 150 feet of wetland — Residential, urban areas, or golf courses are within 150 ft upslope of wetland — Other **YES** multiplier is **2** **NO** multiplier is **1**	***(see p.67)*** multiplier 1
S	**TOTAL - Water Quality Functions** Multiply the score from S1 by S2 ***Add score to table on p. 1***	8

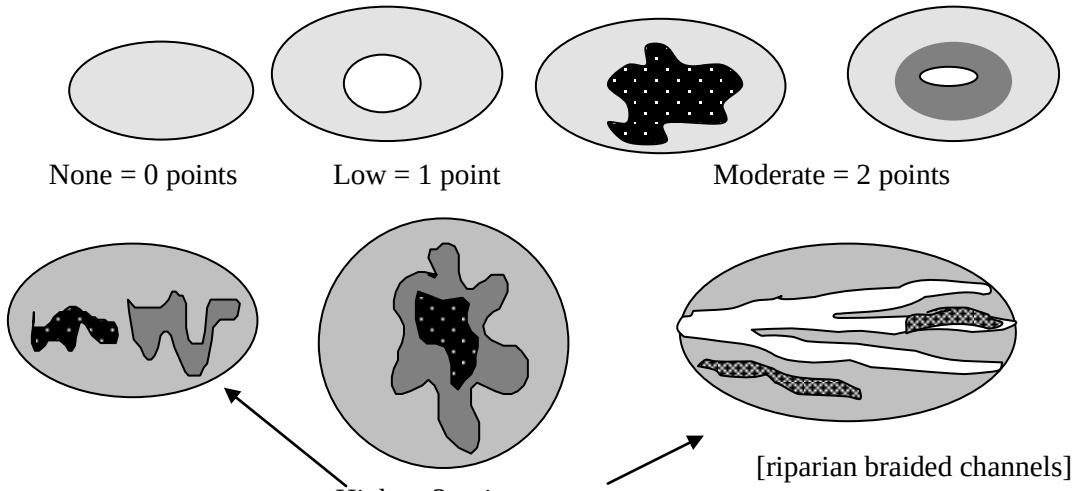
Comments

S	**Slope Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream erosion	**Points** (only 1 score per box)
	S 3. Does the wetland unit have the <u>potential</u> to reduce flooding and stream erosion?	***(see p.68)***
S	S 3.1 Characteristics of vegetation that reduce the velocity of surface flows during storms. *Choose the points appropriate for the description that best fit conditions in the wetland. (stems of plants should be thick enough (usually > 1/8in), or dense enough, to remain erect during surface flows)* Dense, uncut, **rigid** vegetation covers > 90% of the area of the wetland. points = 6 Dense, uncut, **rigid** vegetation > 1/2 area of wetland points = 3 Dense, uncut, **rigid** vegetation > 1/4 area points = 1 More than 1/4 of area is grazed, mowed, tilled or vegetation is not rigid points = 0	6
S	S 3.2 Characteristics of slope wetland that holds back small amounts of flood flows: The slope wetland has small surface depressions that can retain water over at least 10% of its area. YES points = 2 NO points = 0	0
S	*Add the points in the boxes above*	6
S	**S 4. Does the wetland have the <u>opportunity</u> to reduce flooding and erosion?** Is the wetland in a landscape position where the reduction in water velocity it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows? *Note which of the following conditions apply.* ✓ Wetland has surface runoff that drains to a river or stream that has flooding problems — Other *(Answer NO if the major source of water is controlled by a reservoir (e.g. wetland is a seep that is on the downstream side of a dam)* **YES** multiplier is **2** **NO** multiplier is **1**	***(see p. 70)*** multiplier 2
S	**TOTAL - Hydrologic Functions** Multiply the score from S 3 by S 4 ***Add score to table on p. 1***	12

Comments

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit have the <u>potential</u> to provide habitat for many species?	
H 1.1 <u>Vegetation structure</u> ***(see p. 72)*** *Check the types of vegetation classes present (as defined by Cowardin)- Size threshold for each class is ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.* Aquatic bed ✓ Emergent plants Scrub/shrub (areas where shrubs have >30% cover) Forested (areas where trees have >30% cover) *If the unit has a forested class check if:* The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation structures that qualify. If you have:* 4 structures or more points = 4 3 structures points = 2 2 structures points = 1 1 structure points = 0 Map of Cowardin vegetation classes	**Figure ___** 0
H 1.2. <u>Hydroperiods</u> ***(see p. 73)*** *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* Permanently flooded or inundated — 4 or more types present points = 3 ✓ Seasonally flooded or inundated — 3 types present points = 2 Occasionally flooded or inundated — 2 types present point = 1 ✓ Saturated only — 1 type present points = 0 ✓ Permanently flowing stream or river in, or adjacent to, the wetland Seasonally flowing stream in, or adjacent to, the wetland ***Lake-fringe wetland* = 2 points** ***Freshwater tidal wetland* = 2 points** Map of hydroperiods	**Figure ___** 2
H 1.3. <u>Richness of Plant Species</u> ***(see p. 75)*** 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, Canadian Thistle* If you counted: > 19 species points = 2 *List species below if you want to:* 5 - 19 species points = 1 < 5 species points = 0	1

Total for page 3

H 1.4. Interspersion of habitats ***(see p. 76)*** Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  None = 0 points Low = 1 point Moderate = 2 points High = 3 points [riparian braided channels] NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes	**Figure ___** 0
H 1.5. Special Habitat Features: ***(see p. 77)*** *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). Standing snags (diameter at the bottom > 4 inches) in the wetland Undercut banks are present for at least 6.6 ft (2m) and/or overhanging vegetation extends at least 3.3 ft (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft (10m) Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* At least ¼ acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated.*(structures for egg-laying by amphibians)* Invasive plants cover less than 25% of the wetland area in each stratum of plants *NOTE: The 20% stated in early printings of the manual on page 78 is an error.*	0
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	3

Comments

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
H 2.1 Buffers ***(see p. 80)*** *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."* — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer**.** (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** — 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — No paved areas or buildings within 50m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — Heavy grazing in buffer. **Points = 1** — Vegetated buffers are <2m wide (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0**. ✓ Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	**Figure ___** 1
H 2.2 Corridors and Connections ***(see p. 81)*** H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft wide, has at least 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? (*dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor*). YES = **4 points** (*go to H 2.3*) NO = go to H 2.2.2 H 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** (*go to H 2.3*) NO = H 2.2.3 H 2.2.3 Is the wetland: within 5 mi (8km) of a brackish or salt water estuary OR within 3 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? YES = **1 point** NO = **0 points**	0

Total for page 1

H 2.3 Near or adjacent to other priority habitats listed by WDFW ***(see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report http://wdfw.wa.gov/hab/phslist.htm)*** Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* ____**Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre). ____**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 p. 152*). ____**Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock. ____**Old-growth/Mature forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age. **(**Mature forests) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 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 of the Cascade crest. _**Oregon white Oak:** Woodlands 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*). ✓ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other. ____**Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161*). ✓ **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. ____ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report: pp. 167-169 and glossary in Appendix A).* **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 7.6 m (25 ft) high and occurring below 5000 ft. ____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), 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 > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long. If wetland has **3 or more** priority habitats **= 4 points** If wetland has **2** priority habitats = **3 points** If wetland has **1** priority habitat **= 1 point** No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	3

H 2.4 Wetland Landscape *(choose the **one** description of the landscape around the wetland that best fits)* ***(see p. 84)*** There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 There is at least 1 wetland within ½ mile. points = 2 There are no wetlands within ½ mile. points = 0	3
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	7
TOTAL for H 1 from page 14	3
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	**10**

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate answers and Category.

Wetland Type *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	**Category**
SC 1.0 Estuarine wetlands ***(see p. 86)*** Does the wetland unit meet the following criteria for Estuarine wetlands? — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt. YES Go to SC 1.1 NO ✓	
SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? YES Category I NO go to SC 1.2	
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three conditions? YES Category I NO Category II — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native *Spartina* spp. are the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**No**

SC 2.0 Natural Heritage Wetlands ***(see p. 87)*** Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? *(this question is used to screen out most sites before you need to contact WNHP/DNR)* S/T/R information from Appendix D or accessed from WNHP/DNR web site YES____ contact WNHP/DNR (see p. 79) and go to SC 2.2 NO ___ SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? YES Category I NO _×_not a Heritage Wetland	No
SC 3.0 Bogs ***(see p. 87)*** Does the wetland unit (**or any part of the unit**) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 No - go to Q. 2 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? Yes - go to Q. 3 ✓ No - Is not a bog for purpose of rating 3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)? Yes Is a bog for purpose of rating No - go to Q. 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" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. YES Category I No_✓_ Is not a bog for purpose of rating	No

SC 4.0 Forested Wetlands *(see p. 90)* Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *If you answer yes you will still need to rate the wetland based on its functions.* — **Old-growth forests**: (west of Cascade crest) Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm) or more. NOTE: The criterion for dbh is based on measurements for upland forests. Two-hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The DFW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter. — **Mature forests**: (west of the Cascade Crest) Stands where the largest trees are 80 200 years old OR have average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth. YES = Category I NO ✓ not a forested wetland with special characteristics	No
SC 5.0 Wetlands in Coastal Lagoons *(see p. 91)* Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks — The lagoon in which the wetland is located contains surface water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* YES Go to SC 5.1 NO_✓_ not a wetland in a coastal lagoon SC 5.1 Does the wetland meets all of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of invasive plant species (see list of invasive species on p. 74). — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland is larger than 1/10 acre (4350 square feet) YES Category I NO Category II	No

SC 6.0 Interdunal Wetlands ***(see p. 93)*** Is the wetland unit west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? YES - go to SC 6.1 NO ✓ not an interdunal wetland for rating ***If you answer yes you will still need to rate the wetland based on its functions.*** In practical terms that means the following geographic areas: • Long Beach Peninsula- lands west of SR 103 • Grayland-Westport- lands west of SR 105 • Ocean Shores-Copalis- lands west of SR 115 and SR 109 SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is once acre or larger? YES Category II NO go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? YES Category III	No
Category of wetland based on Special Characteristics *Choose the "highest" rating if wetland falls into several categories, and record on p. 1.* If you answered NO for all types enter "Not Applicable" on p.1	**NA**

Wetland name or number TAL-1147 Wetland E

WETLAND RATING FORM – WESTERN WASHINGTON
Version 2 - Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): TAL- 1147 Wetland E Date of site visit: Aug 26, 2014

Rated by DRT Trained by Ecology? Yes ✓ No___ Date of training 10-05

SEC: 8 TWNSHP: 25N RNGE: 6E Is S/T/R in Appendix D? Yes___ No ✓

Map of wetland unit: Figure ____ Estimated size 21,635

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III ✓ IV___

Category I = Score >=70
Category II = Score 51-69
Category III = Score 30-50
Category IV = Score < 30

Score for Water Quality Functions	16
Score for Hydrologic Functions	6
Score for Habitat Functions	17
TOTAL score for Functions	**39**

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ Does not Apply ✓

Final Category (choose the "highest" category from above) **Cat. III**

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	✓
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	✓	Check if unit has multiple HGM classes present	

Does the wetland unit being rated meet any of the criteria below?

If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered* ***animal or plant*** *species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.		✓
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered* ***animal*** *species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category I Natural Heritage Wetlands (see p. 19 of data form).		✓
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*		✓
SP4. *Does the wetland unit have a local significance in addition to its functions*? For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.		✓

To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Classification of Wetland Units in Western Washington

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 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
✓ NO go to 2 **YES** the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe NO – Saltwater Tidal Fringe (Estuarine)**

*If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is rated as an **Estuarine** wetland.* Wetlands that were called estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p.).

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
✓ NO go to 3 **YES** The wetland class is **Flats**

If your wetland can be classified as a "Flats" wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet both** of the following criteria?
___The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) at least 20 acres (8 ha) in size;
___At least 30% of the open water area is deeper than 6.6 ft (2 m)?
✓ NO go to 4 **YES –** The wetland class is **Lake-fringe (Lacustrine Fringe)**

4. 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**?
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 <3ft diameter and less than 1 foot deep).*
✓ NO - go to 5 **YES –** The wetland class is **Slope**

5. 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 two years.

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

✓ NO - go to 6 **YES** The wetland class is **Riverine**

6. 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 7 ✓ **YES –** The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding. The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

✓ NO go to 8 **YES** The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. 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 1-7 APPLY TO DIFFERENT AREAS IN THE 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 your wetland. 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 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 along stream within boundary	Depressional
Depressional + Lake-fringe	Depressional
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE under wetlands with special characteristics

If you are unable still 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 TAL-1147 Wetland E

D	**Depressional and Flats Wetlands** **WATER QUALITY FUNCTIONS** - Indicators that the wetland unit functions to improve water quality	**Points** (only 1 score per box)
D	**D 1. Does the wetland unit have the <u>potential</u> to improve water quality?**	***(see p.38)***
D	D 1.1 Characteristics of surface water flows out of the wetland: Unit is a depression with no surface water leaving it (no outlet) points = 3 Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2 Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) points = 1 Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch points = 1 (*If ditch is not permanently flowing treat unit as "intermittently flowing"*) Provide photo or drawing	**Figure ___** 1
D	S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic *(use NRCS definitions)* YES points = 4 NO points = 0	0
D	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class) Wetland has persistent, ungrazed, vegetation > = 95% of area points = 5 Wetland has persistent, ungrazed, vegetation > = 1/2 of area points = 3 Wetland has persistent, ungrazed vegetation > = 1/10 of area points = 1 Wetland has persistent, ungrazed vegetation <1/10 of area points = 0 Map of Cowardin vegetation classes	**Figure ___** 5
D	D1.4 Characteristics of seasonal ponding or inundation. *This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.* Area seasonally ponded is > ½ total area of wetland points = 4 Area seasonally ponded is > ¼ total area of wetland points = 2 Area seasonally ponded is < ¼ total area of wetland points = 0 Map of Hydroperiods	**Figure ___** 2
D	**Total for D 1** *Add the points in the boxes above*	8
D	**D 2. Does the wetland unit have the <u>opportunity</u> to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* — Grazing in the wetland or within 150 ft ✓ Untreated stormwater discharges to wetland — Tilled fields or orchards within 150 ft of wetland — A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other **YES** multiplier is **2** **NO** multiplier is **1**	***(see p. 44)*** multiplier 2
D	**<u>TOTAL</u> - Water Quality Functions** Multiply the score from D1 by D2 ***Add score to table on p. 1***	16

Comments:

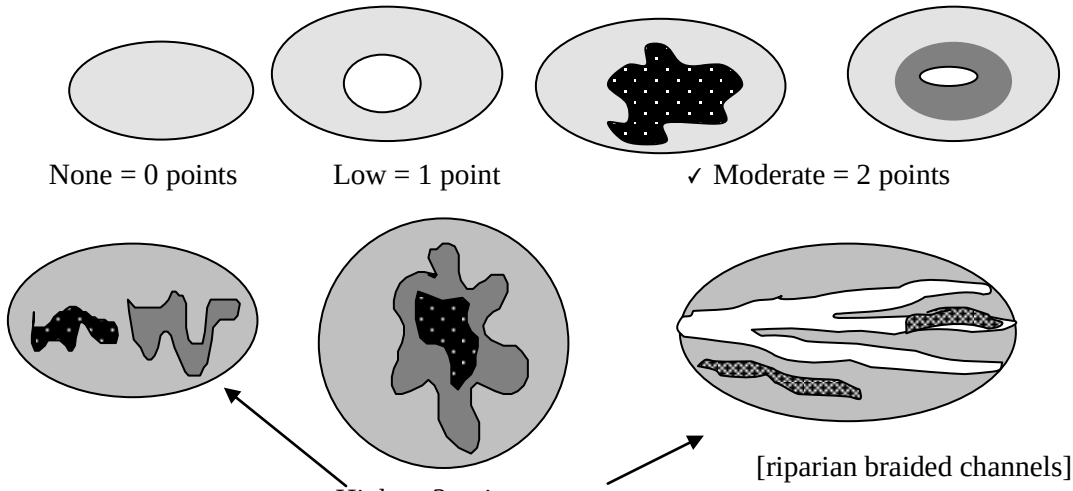
Wetland name or number TAL-1147 Wetland E

D	**Depressional and Flats Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation	**Points** (only 1 score per box)
	D 3. Does the wetland unit have the <u>potential</u> to reduce flooding and erosion?	***(see p.46)***
D	D 3.1 Characteristics of surface water flows out of the wetland unit Unit is a depression with no surface water leaving it (no outlet) points = 4 Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2 Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch points = 1 (*If ditch is not permanently flowing treat unit as "intermittently flowing"*) Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) points = 0	0
D	D 3.2 Depth of storage during wet periods *Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).* Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7 The wetland is a "headwater" wetland" points = 5 Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5 Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3 Unit is flat (yes to Q. 2 or Q. 7 on key) but has small depressions on the surface that trap water points = 1 Marks of ponding less than 0.5 ft points = 0	0
D	D 3.3 Contribution of wetland unit to storage in the watershed *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* The area of the basin is less than 10 times the area of unit points = 5 The area of the basin is 10 to 100 times the area of the unit points = 3 The area of the basin is more than 100 times the area of the unit points = 0 Entire unit is in the FLATS class points = 5	3
D	**Total for D 3** *Add the points in the boxes above*	3
D	**D 4. Does the wetland unit have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* — Wetland is in a headwater of a river or stream that has flooding problems ✓ Wetland drains to a river or stream that has flooding problems — Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems — Other **YES** multiplier is **2** **NO** multiplier is **1**	***(see p. 49)*** multiplier 2
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 ***Add score to table on p. 1***	**6**

Comments:

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit have the <u>potential</u> to provide habitat for many species?	
H 1.1 <u>Vegetation structure</u> ***(see p. 72)*** *Check the types of vegetation classes present (as defined by Cowardin)- Size threshold for each class is ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.* Aquatic bed Emergent plants ✓ Scrub/shrub (areas where shrubs have >30% cover) ✓ Forested (areas where trees have >30% cover) *If the unit has a forested class check if:* ✓ The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation structures that qualify. If you have:* 4 structures or more points = 4 3 structures points = 2 2 structures points = 1 1 structure points = 0 Map of Cowardin vegetation classes	**Figure ___** 2
H 1.2. <u>Hydroperiods</u> ***(see p. 73)*** *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* Permanently flooded or inundated — 4 or more types present points = 3 ✓ Seasonally flooded or inundated — 3 types present points = 2 Occasionally flooded or inundated — 2 types present point = 1 Saturated only — 1 type present points = 0 ✓ Permanently flowing stream or river in, or adjacent to, the wetland Seasonally flowing stream in, or adjacent to, the wetland ***Lake-fringe wetland* = 2 points** ***Freshwater tidal wetland* = 2 points** Map of hydroperiods	**Figure ___** 1
H 1.3. <u>Richness of Plant Species</u> ***(see p. 75)*** 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, Canadian Thistle* If you counted: > 19 species points = 2 *List species below if you want to:* 5 - 19 species points = 1 *Frla, Poba, Alru, Crmo, Coal, Atfi, Ruar* < 5 species points = 0	1

Total for page 4

H 1.4. Interspersion of habitats ***(see p. 76)*** Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  None = 0 points Low = 1 point ✓ Moderate = 2 points [riparian braided channels] High = 3 points NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes	**Figure ___** 2
H 1.5. Special Habitat Features: ***(see p. 77)*** *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ✓ Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). ✓ Standing snags (diameter at the bottom > 4 inches) in the wetland Undercut banks are present for at least 6.6 ft (2m) and/or overhanging vegetation extends at least 3.3 ft (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft (10m) Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* At least ¼ acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated.*(structures for egg-laying by amphibians)* ✓ Invasive plants cover less than 25% of the wetland area in each stratum of plants *NOTE: The 20% stated in early printings of the manual on page 78 is an error.*	3
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	9

Comments

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
H 2.1 Buffers ***(see p. 80)*** *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."* — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer**.** (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** — 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** ✓ — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — No paved areas or buildings within 50m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — Heavy grazing in buffer. **Points = 1** — Vegetated buffers are <2m wide (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0**. — Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	**Figure ___** 2
H 2.2 Corridors and Connections ***(see p. 81)*** H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft wide, has at least 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? (*dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor*). YES = **4 points** (*go to H 2.3*) NO = go to H 2.2.2 H 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** (*go to H 2.3*) NO = H 2.2.3 H 2.2.3 Is the wetland: within 5 mi (8km) of a brackish or salt water estuary OR within 3 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? YES = **1 point** NO = **0 points**	0

Total for page 2

H 2.3 Near or adjacent to other priority habitats listed by WDFW ***(see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report http://wdfw.wa.gov/hab/phslist.htm)*** Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* ____**Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre). ____**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 p. 152*). ____**Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock. ____**Old-growth/Mature forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age. **(**Mature forests) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 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 of the Cascade crest. _**Oregon white Oak:** Woodlands 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*). ✓ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other. ____**Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161*). ✓ **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. ____ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report: pp. 167-169 and glossary in Appendix A).* **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 7.6 m (25 ft) high and occurring below 5000 ft. ____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), 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 > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long. If wetland has **3 or more** priority habitats **= 4 points** If wetland has **2** priority habitats = **3 points** If wetland has **1** priority habitat **= 1 point** No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	3

H 2.4 Wetland Landscape *(choose the **one** description of the landscape around the wetland that best fits)* ***(see p. 84)*** There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 There is at least 1 wetland within ½ mile. points = 2 There are no wetlands within ½ mile. points = 0	3
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	8
TOTAL for H 1 from page 14	9
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	**17**

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate answers and Category.

Wetland Type *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	**Category**
SC 1.0 Estuarine wetlands *(see p. 86)* Does the wetland unit meet the following criteria for Estuarine wetlands? — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt. YES Go to SC 1.1 NO ✓	
SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? YES Category I NO go to SC 1.2	
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three conditions? YES Category I NO Category II — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native *Spartina* spp. are the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	No

SC 2.0 Natural Heritage Wetlands ***(see p. 87)*** Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? *(this question is used to screen out most sites before you need to contact WNHP/DNR)* S/T/R information from Appendix D or accessed from WNHP/DNR web site YES____ contact WNHP/DNR (see p. 79) and go to SC 2.2 NO __✓__ SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? YES Category I NO __✓__not a Heritage Wetland	No
SC 3.0 Bogs ***(see p. 87)*** Does the wetland unit (**or any part of the unit**) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 No - go to Q. 2 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? Yes - go to Q. 3 ✓ No - Is not a bog for purpose of rating 3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)? Yes Is a bog for purpose of rating No - go to Q. 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" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. YES Category I No__✓__ Is not a bog for purpose of rating	No

SC 4.0 Forested Wetlands *(see p. 90)* Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *If you answer yes you will still need to rate the wetland based on its functions.* — **Old-growth forests**: (west of Cascade crest) Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm) or more. NOTE: The criterion for dbh is based on measurements for upland forests. Two-hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The DFW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter. — **Mature forests**: (west of the Cascade Crest) Stands where the largest trees are 80 200 years old OR have average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth. YES = Category I NO ✓ not a forested wetland with special characteristics	No
SC 5.0 Wetlands in Coastal Lagoons *(see p. 91)* Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks — The lagoon in which the wetland is located contains surface water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* YES Go to SC 5.1 NO_✓_ not a wetland in a coastal lagoon SC 5.1 Does the wetland meets all of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of invasive plant species (see list of invasive species on p. 74). — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland is larger than 1/10 acre (4350 square feet) YES Category I NO Category II	No

SC 6.0 Interdunal Wetlands ***(see p. 93)*** Is the wetland unit west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? YES - go to SC 6.1 NO ✓ not an interdunal wetland for rating ***If you answer yes you will still need to rate the wetland based on its functions.*** In practical terms that means the following geographic areas: • Long Beach Peninsula- lands west of SR 103 • Grayland-Westport- lands west of SR 105 • Ocean Shores-Copalis- lands west of SR 115 and SR 109 SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is once acre or larger? YES Category II NO go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? YES Category III	No
Category of wetland based on Special Characteristics *Choose the "highest" rating if wetland falls into several categories, and record on p. 1.* If you answered NO for all types enter "Not Applicable" on p.1	**NA**

Wetland name or number TAL-1147 Wetland G

WETLAND RATING FORM – WESTERN WASHINGTON
Version 2 - Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): TAL- 1147 Wetland G Date of site visit: 04-30-15

Rated by DRT Trained by Ecology? Yes ✓ No___ Date of training 10-05

SEC: 8 TWNSHP: 25N RNGE: 6E Is S/T/R in Appendix D? Yes___ No ✓

Map of wetland unit: Figure ____ Estimated size 6,792 sf

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III___ IV ✓

Category I = Score >=70
Category II = Score 51-69
Category III = Score 30-50
Category IV = Score < 30

Score for Water Quality Functions	3
Score for Hydrologic Functions	4
Score for Habitat Functions	15
TOTAL score for Functions	**22**

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ Does not Apply ✓

Final Category (choose the "highest" category from above) **Cat. IV**

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	✓
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	✓	Check if unit has multiple HGM classes present	

Does the wetland unit being rated meet any of the criteria below?

If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered* ***animal or plant*** *species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.		✓
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered* ***animal*** *species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category I Natural Heritage Wetlands (see p. 19 of data form).		✓
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*		✓
SP4. *Does the wetland unit have a local significance in addition to its functions*? For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.		✓

To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Classification of Wetland Units in Western Washington

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 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
✓ NO go to 2 **YES** the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe NO – Saltwater Tidal Fringe (Estuarine)**

*If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is rated as an **Estuarine** wetland.* Wetlands that were called estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p.).

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
✓ NO go to 3 **YES** The wetland class is **Flats**

If your wetland can be classified as a "Flats" wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet both** of the following criteria?
___The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) at least 20 acres (8 ha) in size;
___At least 30% of the open water area is deeper than 6.6 ft (2 m)?
✓ NO go to 4 **YES –** The wetland class is **Lake-fringe (Lacustrine Fringe)**

4. 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**?
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 <3ft diameter and less than 1 foot deep).*
NO - go to 5 ✓ **YES –** The wetland class is **Slope**

5. 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 two years.

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

✓ NO - go to 6 **YES** The wetland class is **Riverine**

6. 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 7 **YES –** The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding. The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

✓ NO go to 8 **YES** The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. 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 1-7 APPLY TO DIFFERENT AREAS IN THE 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 your wetland. 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 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 along stream within boundary	Depressional
Depressional + Lake-fringe	Depressional
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE under wetlands with special characteristics

If you are unable still 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.

S	**Slope Wetlands** WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality	**Points** (only 1 score per box)
S	**S 1. Does the wetland unit have the <u>potential</u> to improve water quality?**	***(see p.64)***
S	S 1.1 Characteristics of average slope of unit: Slope is1% or less *(a 1% slope has a 1 foot vertical drop in elevation for every 100 ft horizontal distance*) points = 3 Slope is 1% - 2% points = 2 Slope is 2% - 5% points = 1 Slope is greater than 5% points = 0	3
S	S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic *(use NRCS definitions)* YES = 3 points NO = 0 points	0
S	S 1.3 Characteristics of the vegetation in the wetland that trap sediments and pollutants: *Choose the points appropriate for the description that best fits the vegetation in the wetland. Dense vegetation means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 inches.* Dense, uncut, herbaceous vegetation > 90% of the wetland area points = 6 Dense, uncut, herbaceous vegetation > 1/2 of area points = 3 Dense, woody, vegetation > ½ of area points = 2 Dense, uncut, herbaceous vegetation > 1/4 of area points = 1 Does not meet any of the criteria above for vegetation points = 0 Aerial photo or map with vegetation polygons	**Figure ___** 0
S	**Total for S 1** *Add the points in the boxes above*	3
S	**S 2. Does the wetland unit have the <u>opportunity</u> to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity*. — Grazing in the wetland or within 150ft — Untreated stormwater discharges to wetland — Tilled fields, logging, or orchards within 150 feet of wetland — Residential, urban areas, or golf courses are within 150 ft upslope of wetland — Other **YES** multiplier is **2** **NO** multiplier is **1**	***(see p.67)*** multiplier 1
S	**TOTAL - Water Quality Functions** Multiply the score from S1 by S2 ***Add score to table on p. 1***	3

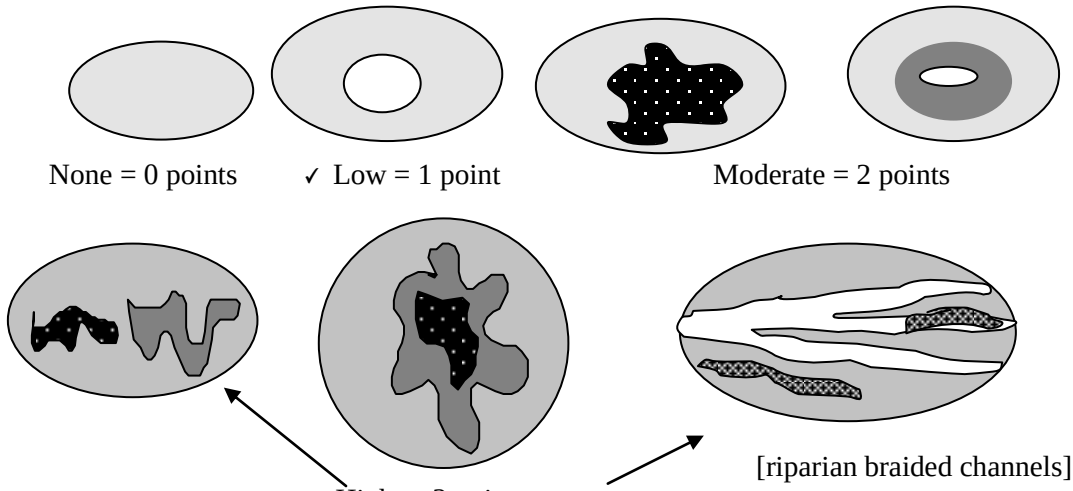
Comments

S	**Slope Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream erosion	**Points** (only 1 score per box)
	S 3. Does the wetland unit have the <u>potential</u> to reduce flooding and stream erosion?	***(see p.68)***
S	S 3.1 Characteristics of vegetation that reduce the velocity of surface flows during storms. *Choose the points appropriate for the description that best fit conditions in the wetland. (stems of plants should be thick enough (usually > 1/8in), or dense enough, to remain erect during surface flows)* Dense, uncut, **rigid** vegetation covers > 90% of the area of the wetland. points = 6 Dense, uncut, **rigid** vegetation > 1/2 area of wetland points = 3 Dense, uncut, **rigid** vegetation > 1/4 area points = 1 More than 1/4 of area is grazed, mowed, tilled or vegetation is not rigid points = 0	0
S	S 3.2 Characteristics of slope wetland that holds back small amounts of flood flows: The slope wetland has small surface depressions that can retain water over at least 10% of its area. YES points = 2 NO points = 0	2
S	*Add the points in the boxes above*	2
S	**S 4. Does the wetland have the <u>opportunity</u> to reduce flooding and erosion?** Is the wetland in a landscape position where the reduction in water velocity it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows? *Note which of the following conditions apply.* — Wetland has surface runoff that drains to a river or stream that has flooding problems ✓ Other Flows to Evans Creek *(Answer NO if the major source of water is controlled by a reservoir (e.g. wetland is a seep that is on the downstream side of a dam)* **YES** multiplier is **2** **NO** multiplier is **1**	***(see p. 70)*** multiplier 2
S	**TOTAL - Hydrologic Functions** Multiply the score from S 3 by S 4 ***Add score to table on p. 1***	4

Comments

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit have the <u>potential</u> to provide habitat for many species?	
H 1.1 <u>Vegetation structure</u> ***(see p. 72)*** *Check the types of vegetation classes present (as defined by Cowardin)- Size threshold for each class is ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.* Aquatic bed ✓ Emergent plants Scrub/shrub (areas where shrubs have >30% cover) ✓ Forested (areas where trees have >30% cover) *If the unit has a forested class check if:* The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation structures that qualify. If you have:* 4 structures or more points = 4 3 structures points = 2 2 structures points = 1 1 structure points = 0 Map of Cowardin vegetation classes	**Figure ___** 1
H 1.2. <u>Hydroperiods</u> ***(see p. 73)*** *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* Permanently flooded or inundated — 4 or more types present points = 3 Seasonally flooded or inundated — 3 types present points = 2 Occasionally flooded or inundated — 2 types present point = 1 ✓ Saturated only — 1 type present points = 0 ✓ Permanently flowing stream or river in, or adjacent to, the wetland Seasonally flowing stream in, or adjacent to, the wetland ***Lake-fringe wetland* = 2 points** ***Freshwater tidal wetland* = 2 points** Map of hydroperiods	**Figure ___** 1
H 1.3. <u>Richness of Plant Species</u> ***(see p. 75)*** 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, Canadian Thistle* If you counted: > 19 species points = 2 *List species below if you want to:* 5 - 19 species points = 1 < 5 species points = 0	0

Total for page 2

H 1.4. Interspersion of habitats ***(see p. 76)*** Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  None = 0 points ✓ Low = 1 point Moderate = 2 points [riparian braided channels] High = 3 points NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes	**Figure ___** 1
H 1.5. Special Habitat Features: ***(see p. 77)*** *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). Standing snags (diameter at the bottom > 4 inches) in the wetland Undercut banks are present for at least 6.6 ft (2m) and/or overhanging vegetation extends at least 3.3 ft (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft (10m) Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* At least ¼ acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated.*(structures for egg-laying by amphibians)* ✓ Invasive plants cover less than 25% of the wetland area in each stratum of plants *NOTE: The 20% stated in early printings of the manual on page 78 is an error.*	1
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	4

Comments

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
H 2.1 Buffers ***(see p. 80)*** *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."* — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer**.** (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** — 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** ✓ — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — No paved areas or buildings within 50m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — Heavy grazing in buffer. **Points = 1** — Vegetated buffers are <2m wide (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0**. — Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	**Figure ___** 3
H 2.2 Corridors and Connections ***(see p. 81)*** H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft wide, has at least 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? (*dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor*). YES = **4 points** (*go to H 2.3*) NO = go to H 2.2.2 H 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** (*go to H 2.3*) NO = H 2.2.3 H 2.2.3 Is the wetland: within 5 mi (8km) of a brackish or salt water estuary OR within 3 mi of a large field or pasture (>40 acres) OR ✓ within 1 mi of a lake greater than 20 acres? YES = **1 point** NO = **0 points**	1

Total for page 4

H 2.3 Near or adjacent to other priority habitats listed by WDFW ***(see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report http://wdfw.wa.gov/hab/phslist.htm)*** Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* ____**Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre). ____**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 p. 152*). ____**Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock. ____**Old-growth/Mature forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age. **(**Mature forests) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 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 of the Cascade crest. _**Oregon white Oak:** Woodlands 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*). ✓ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other. ____**Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161*). ✓ **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. ____ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report: pp. 167-169 and glossary in Appendix A).* **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 7.6 m (25 ft) high and occurring below 5000 ft. ____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), 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 > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long. If wetland has **3 or more** priority habitats **= 4 points** If wetland has **2** priority habitats = **3 points** If wetland has **1** priority habitat **= 1 point** No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	4

H 2.4 Wetland Landscape *(choose the **one** description of the landscape around the wetland that best fits)* ***(see p. 84)*** There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 There is at least 1 wetland within ½ mile. points = 2 There are no wetlands within ½ mile. points = 0	3
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	11
TOTAL for H 1 from page 14	4
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	**15**

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate answers and Category.

Wetland Type *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	**Category**
SC 1.0 Estuarine wetlands *(see p. 86)* Does the wetland unit meet the following criteria for Estuarine wetlands? — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt. YES Go to SC 1.1 NO ✓	
SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? YES Category I NO go to SC 1.2	
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three conditions? YES Category I NO Category II — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native *Spartina* spp. are the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	No

SC 2.0 Natural Heritage Wetlands ***(see p. 87)*** Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? *(this question is used to screen out most sites before you need to contact WNHP/DNR)* S/T/R information from Appendix D or accessed from WNHP/DNR web site YES____ contact WNHP/DNR (see p. 79) and go to SC 2.2 NO __✓__ SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? YES Category I NO __✓__not a Heritage Wetland	No
SC 3.0 Bogs ***(see p. 87)*** Does the wetland unit (**or any part of the unit**) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 No - go to Q. 2 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? Yes - go to Q. 3 ✓ No - Is not a bog for purpose of rating 3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)? Yes Is a bog for purpose of rating No - go to Q. 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" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. YES Category I No__✓__ Is not a bog for purpose of rating	No

SC 4.0 Forested Wetlands *(see p. 90)* Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *If you answer yes you will still need to rate the wetland based on its functions.* — **Old-growth forests**: (west of Cascade crest) Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm) or more. NOTE: The criterion for dbh is based on measurements for upland forests. Two-hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The DFW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter. — **Mature forests**: (west of the Cascade Crest) Stands where the largest trees are 80 200 years old OR have average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth. YES = Category I NO ✓ not a forested wetland with special characteristics	No
SC 5.0 Wetlands in Coastal Lagoons *(see p. 91)* Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks — The lagoon in which the wetland is located contains surface water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* YES Go to SC 5.1 NO_✓_ not a wetland in a coastal lagoon SC 5.1 Does the wetland meets all of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of invasive plant species (see list of invasive species on p. 74). — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland is larger than 1/10 acre (4350 square feet) YES Category I NO Category II	No

SC 6.0 Interdunal Wetlands ***(see p. 93)*** Is the wetland unit west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? YES - go to SC 6.1 NO __ not an interdunal wetland for rating ***If you answer yes you will still need to rate the wetland based on its functions.*** In practical terms that means the following geographic areas: • Long Beach Peninsula- lands west of SR 103 • Grayland-Westport- lands west of SR 105 • Ocean Shores-Copalis- lands west of SR 115 and SR 109 SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is once acre or larger? YES Category II NO go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? YES Category III	No
Category of wetland based on Special Characteristics *Choose the "highest" rating if wetland falls into several categories, and record on p. 1.* If you answered NO for all types enter "Not Applicable" on p.1	**NA**

Wetland name or number **TAL-1147 Wetland H**

WETLAND RATING FORM – WESTERN WASHINGTON
Version 2 - Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): TAL- 1147 Wetland H Date of site visit: 04-30-15

Rated by DRT Trained by Ecology? Yes ✓ No___ Date of training 10-05

SEC: 8 TWNSHP: 25N RNGE: 6E Is S/T/R in Appendix D? Yes___ No ✓

Map of wetland unit: Figure ____ Estimated size _____

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III___ IV ✓

Category I Score > 70
Category II Score 51-69
Category III Score 30-50
Category IV Score < 30

Score for Water Quality Functions	3
Score for Hydrologic Functions	4
Score for Habitat Functions	11
TOTAL score for Functions	**18**

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ Does not Apply ✓

Final Category (choose the "highest" category from above) **Cat. IV**

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		**Wetland HGM Class used for Rating**	
Estuarine		**Depressional**	
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	✓
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	✓	Check if unit has multiple HGM classes present	

Does the wetland unit being rated meet any of the criteria below?

If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered* ***animal or plant*** *species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.		✓
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered* ***animal*** *species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category I Natural Heritage Wetlands (see p. 19 of data form).		✓
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*		✓
SP4. *Does the wetland unit have a local significance in addition to its functions*? For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.		✓

To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Classification of Wetland Units in Western Washington

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 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
✓ NO go to 2 **YES** the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe NO – Saltwater Tidal Fringe (Estuarine)**

*If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is rated as an **Estuarine** wetland.* Wetlands that were called estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p.).

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
✓ NO go to 3 **YES** The wetland class is **Flats**

If your wetland can be classified as a "Flats" wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet both** of the following criteria?
___The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) at least 20 acres (8 ha) in size;
___At least 30% of the open water area is deeper than 6.6 ft (2 m)?
✓ NO go to 4 **YES –** The wetland class is **Lake-fringe (Lacustrine Fringe)**

4. 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**?
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 <3ft diameter and less than 1 foot deep).*
NO - go to 5 ✓ **YES –** The wetland class is **Slope**

5. 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 two years.

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

✓ NO - go to 6 **YES** The wetland class is **Riverine**

6. 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 7 **YES –** The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding. The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

✓ NO go to 8 **YES** The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. 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 1-7 APPLY TO DIFFERENT AREAS IN THE 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 your wetland. 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 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 along stream within boundary	Depressional
Depressional + Lake-fringe	Depressional
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE under wetlands with special characteristics

If you are unable still 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.

S	**Slope Wetlands** WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality	**Points** (only 1 score per box)
S	**S 1. Does the wetland unit have the <u>potential</u> to improve water quality?**	***(see p.64)***
S	S 1.1 Characteristics of average slope of unit: Slope is1% or less *(a 1% slope has a 1 foot vertical drop in elevation for every 100 ft horizontal distance*) points = 3 Slope is 1% - 2% points = 2 Slope is 2% - 5% points = 1 Slope is greater than 5% points = 0	3
S	S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic *(use NRCS definitions)* YES = 3 points NO = 0 points	0
S	S 1.3 Characteristics of the vegetation in the wetland that trap sediments and pollutants: *Choose the points appropriate for the description that best fits the vegetation in the wetland. Dense vegetation means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 inches.* Dense, uncut, herbaceous vegetation > 90% of the wetland area points = 6 Dense, uncut, herbaceous vegetation > 1/2 of area points = 3 Dense, woody, vegetation > ½ of area points = 2 Dense, uncut, herbaceous vegetation > 1/4 of area points = 1 Does not meet any of the criteria above for vegetation points = 0 Aerial photo or map with vegetation polygons	**Figure ___** 0
S	**Total for S 1** *Add the points in the boxes above*	3
S	**S 2. Does the wetland unit have the <u>opportunity</u> to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity*. — Grazing in the wetland or within 150ft — Untreated stormwater discharges to wetland — Tilled fields, logging, or orchards within 150 feet of wetland — Residential, urban areas, or golf courses are within 150 ft upslope of wetland — Other **YES** multiplier is **2** **NO** multiplier is **1**	***(see p.67)*** multiplier 1
S	**TOTAL - Water Quality Functions** Multiply the score from S1 by S2 ***Add score to table on p. 1***	3

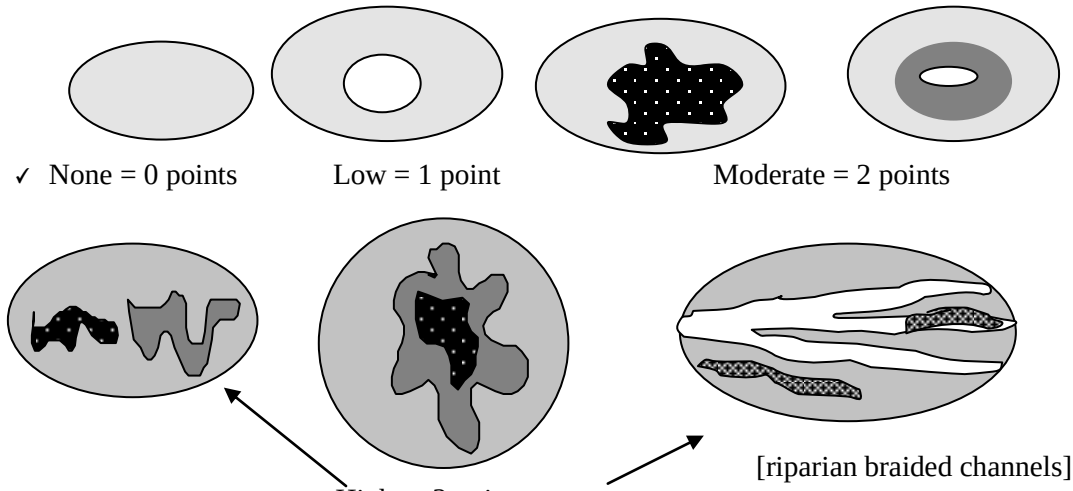
Comments

S	**Slope Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream erosion	**Points** (only 1 score per box)
	S 3. Does the wetland unit have the <u>potential</u> to reduce flooding and stream erosion?	***(see p.68)***
S	S 3.1 Characteristics of vegetation that reduce the velocity of surface flows during storms. *Choose the points appropriate for the description that best fit conditions in the wetland. (stems of plants should be thick enough (usually > 1/8in), or dense enough, to remain erect during surface flows)* Dense, uncut, **rigid** vegetation covers > 90% of the area of the wetland. points = 6 Dense, uncut, **rigid** vegetation > 1/2 area of wetland points = 3 Dense, uncut, **rigid** vegetation > 1/4 area points = 1 More than 1/4 of area is grazed, mowed, tilled or vegetation is not rigid points = 0	0
S	S 3.2 Characteristics of slope wetland that holds back small amounts of flood flows: The slope wetland has small surface depressions that can retain water over at least 10% of its area. YES points = 2 NO points = 0	2
S	*Add the points in the boxes above*	2
S	**S 4. Does the wetland have the <u>opportunity</u> to reduce flooding and erosion?** Is the wetland in a landscape position where the reduction in water velocity it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows? *Note which of the following conditions apply.* ✓ Wetland has surface runoff that drains to a river or stream that has flooding problems — Other *(Answer NO if the major source of water is controlled by a reservoir (e.g. wetland is a seep that is on the downstream side of a dam)* **YES** multiplier is **2** **NO** multiplier is **1**	***(see p. 70)*** multiplier 2
S	**TOTAL - Hydrologic Functions** Multiply the score from S 3 by S 4 ***Add score to table on p. 1***	4

Comments Discharges to a ditch that flows into Evans Creek

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit have the <u>potential</u> to provide habitat for many species?	
H 1.1 <u>Vegetation structure</u> ***(see p. 72)*** *Check the types of vegetation classes present (as defined by Cowardin)- Size threshold for each class is ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.* Aquatic bed ✓ Emergent plants Scrub/shrub (areas where shrubs have >30% cover) Forested (areas where trees have >30% cover) *If the unit has a forested class check if:* The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation structures that qualify. If you have:* 4 structures or more points = 4 3 structures points = 2 2 structures points = 1 1 structure points = 0 Map of Cowardin vegetation classes	**Figure ___** 0
H 1.2. <u>Hydroperiods</u> ***(see p. 73)*** *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* Permanently flooded or inundated — 4 or more types present points = 3 ✓ Seasonally flooded or inundated — 3 types present points = 2 Occasionally flooded or inundated — 2 types present point = 1 ✓ Saturated only — 1 type present points = 0 ✓ Permanently flowing stream or river in, or adjacent to, the wetland Seasonally flowing stream in, or adjacent to, the wetland ***Lake-fringe wetland* = 2 points** ***Freshwater tidal wetland* = 2 points** Map of hydroperiods	**Figure ___** 2
H 1.3. <u>Richness of Plant Species</u> ***(see p. 75)*** 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, Canadian Thistle* If you counted: > 19 species points = 2 *List species below if you want to:* 5 - 19 species points = 1 < 5 species points = 0	0

Total for page 2

H 1.4. Interspersion of habitats ***(see p. 76)*** Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  ✓ None = 0 points Low = 1 point Moderate = 2 points High = 3 points [riparian braided channels] NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes	**Figure ___** 0
H 1.5. Special Habitat Features: ***(see p. 77)*** *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). Standing snags (diameter at the bottom > 4 inches) in the wetland Undercut banks are present for at least 6.6 ft (2m) and/or overhanging vegetation extends at least 3.3 ft (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft (10m) Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* At least ¼ acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated.*(structures for egg-laying by amphibians)* ✓ Invasive plants cover less than 25% of the wetland area in each stratum of plants *NOTE: The 20% stated in early printings of the manual on page 78 is an error.*	1
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	3

Comments

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
H 2.1 Buffers ***(see p. 80)*** *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."* — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer**.** (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** — 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — No paved areas or buildings within 50m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — Heavy grazing in buffer. **Points = 1** — Vegetated buffers are <2m wide (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0**. ✓ Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	**Figure ___** 1
H 2.2 Corridors and Connections ***(see p. 81)*** H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft wide, has at least 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? (*dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor*). YES = **4 points** (*go to H 2.3*) NO = go to H 2.2.2 H 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** (*go to H 2.3*) NO = H 2.2.3 H 2.2.3 Is the wetland: within 5 mi (8km) of a brackish or salt water estuary OR within 3 mi of a large field or pasture (>40 acres) OR ✓ within 1 mi of a lake greater than 20 acres? ✓ YES = **1 point** NO = **0 points**	1

Total for page 2

H 2.3 Near or adjacent to other priority habitats listed by WDFW ***(see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report http://wdfw.wa.gov/hab/phslist.htm)*** Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* ____**Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre). ____**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 p. 152*). ____**Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock. ____**Old-growth/Mature forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age. **(**Mature forests) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 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 of the Cascade crest. _**Oregon white Oak:** Woodlands 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*). ✓ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other. ____**Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161*). ✓ **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. ____ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report: pp. 167-169 and glossary in Appendix A).* **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 7.6 m (25 ft) high and occurring below 5000 ft. ____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), 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 > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long. If wetland has **3 or more** priority habitats **= 4 points** If wetland has **2** priority habitats = **3 points** If wetland has **1** priority habitat **= 1 point** No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	3

H 2.4 Wetland Landscape *(choose the **one** description of the landscape around the wetland that best fits)* ***(see p. 84)*** There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 There is at least 1 wetland within ½ mile. points = 2 There are no wetlands within ½ mile. points = 0	3
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	8
TOTAL for H 1 from page 14	3
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	**11**

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate answers and Category.

Wetland Type *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	**Category**
SC 1.0 Estuarine wetlands *(see p. 86)* Does the wetland unit meet the following criteria for Estuarine wetlands? — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt. YES Go to SC 1.1 NO ✓	
SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? YES Category I NO go to SC 1.2	
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three conditions? YES Category I NO Category II — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native *Spartina* spp. are the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	No

SC 2.0 Natural Heritage Wetlands ***(see p. 87)*** Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? *(this question is used to screen out most sites before you need to contact WNHP/DNR)* S/T/R information from Appendix D or accessed from WNHP/DNR web site YES____ contact WNHP/DNR (see p. 79) and go to SC 2.2 NO ___ SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? YES Category I NO __✓__not a Heritage Wetland	No
SC 3.0 Bogs ***(see p. 87)*** Does the wetland unit (**or any part of the unit**) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 No - go to Q. 2 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? Yes - go to Q. 3 No - Is not a bog for purpose of rating 3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)? Yes Is a bog for purpose of rating ✓ No - go to Q. 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" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. YES Category I No__✓_ Is not a bog for purpose of rating	No

SC 4.0 Forested Wetlands *(see p. 90)* Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *If you answer yes you will still need to rate the wetland based on its functions.* — **Old-growth forests**: (west of Cascade crest) Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm) or more. NOTE: The criterion for dbh is based on measurements for upland forests. Two-hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The DFW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter. — **Mature forests**: (west of the Cascade Crest) Stands where the largest trees are 80 200 years old OR have average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth. YES = Category I NO ✓ not a forested wetland with special characteristics	No
SC 5.0 Wetlands in Coastal Lagoons *(see p. 91)* Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks — The lagoon in which the wetland is located contains surface water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* YES Go to SC 5.1 NO_✓_ not a wetland in a coastal lagoon SC 5.1 Does the wetland meets all of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of invasive plant species (see list of invasive species on p. 74). — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland is larger than 1/10 acre (4350 square feet) YES Category I NO Category II	No

SC 6.0 Interdunal Wetlands ***(see p. 93)*** Is the wetland unit west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? YES - go to SC 6.1 NO ✓ not an interdunal wetland for rating ***If you answer yes you will still need to rate the wetland based on its functions.*** In practical terms that means the following geographic areas: • Long Beach Peninsula- lands west of SR 103 • Grayland-Westport- lands west of SR 105 • Ocean Shores-Copalis- lands west of SR 115 and SR 109 SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is once acre or larger? YES Category II NO go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? YES Category III	No
Category of wetland based on Special Characteristics *Choose the "highest" rating if wetland falls into several categories, and record on p. 1.* If you answered NO for all types enter "Not Applicable" on p.1	**NA**

Wetland name or number **TAL-1147 Wetland I**

WETLAND RATING FORM – WESTERN WASHINGTON
Version 2 - Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): TAL- 1147 Wetland I Date of site visit: 04-30-15

Rated by DRT Trained by Ecology? Yes ✓ No___ Date of training 10-05

SEC: 8 TWNSHP: 25N RNGE: 6E Is S/T/R in Appendix D? Yes___ No___

Map of wetland unit: Figure ____ Estimated size _____

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III___ IV ✓

Category I Score > 70
Category II Score 51-69
Category III Score 30-50
Category IV Score < 30

Score for Water Quality Functions	3
Score for Hydrologic Functions	14
Score for Habitat Functions	10
TOTAL score for Functions	**27**

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ Does not Apply ✓

Final Category (choose the "highest" category from above) **Cat. IV**

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		**Wetland HGM Class used for Rating**	
Estuarine		**Depressional**	✓
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	✓	Check if unit has multiple HGM classes present	

Does the wetland unit being rated meet any of the criteria below?

If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered* ***animal or plant*** *species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.		✓
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered* ***animal*** *species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category I Natural Heritage Wetlands (see p. 19 of data form).		✓
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*		✓
SP4. *Does the wetland unit have a local significance in addition to its functions*? For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.		✓

To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Classification of Wetland Units in Western Washington

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 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
✓ NO go to 2 **YES** the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe NO – Saltwater Tidal Fringe (Estuarine)**

*If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is rated as an **Estuarine** wetland.* Wetlands that were called estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p.).

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
✓ NO go to 3 **YES** The wetland class is **Flats**

If your wetland can be classified as a "Flats" wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet both** of the following criteria?
___The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) at least 20 acres (8 ha) in size;
___At least 30% of the open water area is deeper than 6.6 ft (2 m)?
✓ NO go to 4 **YES –** The wetland class is **Lake-fringe (Lacustrine Fringe)**

4. 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**?
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 <3ft diameter and less than 1 foot deep).*
✓ NO - go to 5 **YES –** The wetland class is **Slope**

5. 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 two years.

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

✓ NO - go to 6 **YES** The wetland class is **Riverine**

6. 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 7 ✓ **YES –** The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding. The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

✓ NO go to 8 **YES** The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. 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 1-7 APPLY TO DIFFERENT AREAS IN THE 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 your wetland. 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 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 along stream within boundary	Depressional
Depressional + Lake-fringe	Depressional
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE under wetlands with special characteristics

If you are unable still 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 TAL-1147 Wetland I

D	**Depressional and Flats Wetlands** **WATER QUALITY FUNCTIONS** - Indicators that the wetland unit functions to improve water quality	**Points** (only 1 score per box)
D	**D 1. Does the wetland unit have the <u>potential</u> to improve water quality?**	***(see p.38)***
D	D 1.1 Characteristics of surface water flows out of the wetland: Unit is a depression with no surface water leaving it (no outlet) points = 3 Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2 Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) points = 1 Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch points = 1 (*If ditch is not permanently flowing treat unit as "intermittently flowing"*) Provide photo or drawing	**Figure ___** 3
D	S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic *(use NRCS definitions)* YES points = 4 NO points = 0	0
D	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class) Wetland has persistent, ungrazed, vegetation > = 95% of area points = 5 Wetland has persistent, ungrazed, vegetation > = 1/2 of area points = 3 Wetland has persistent, ungrazed vegetation > = 1/10 of area points = 1 Wetland has persistent, ungrazed vegetation <1/10 of area points = 0 Map of Cowardin vegetation classes	**Figure ___** 0
D	D1.4 Characteristics of seasonal ponding or inundation. *This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.* Area seasonally ponded is > ½ total area of wetland points = 4 Area seasonally ponded is > ¼ total area of wetland points = 2 Area seasonally ponded is < ¼ total area of wetland points = 0 Map of Hydroperiods	**Figure ___** 0
D	**Total for D 1** *Add the points in the boxes above*	3
D	**D 2. Does the wetland unit have the <u>opportunity</u> to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* — Grazing in the wetland or within 150 ft — Untreated stormwater discharges to wetland — Tilled fields or orchards within 150 ft of wetland — A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other **YES** multiplier is **2** **NO** multiplier is **1**	***(see p. 44)*** multiplier 1
D	**<u>TOTAL</u> - Water Quality Functions** Multiply the score from D1 by D2 ***Add score to table on p. 1***	3

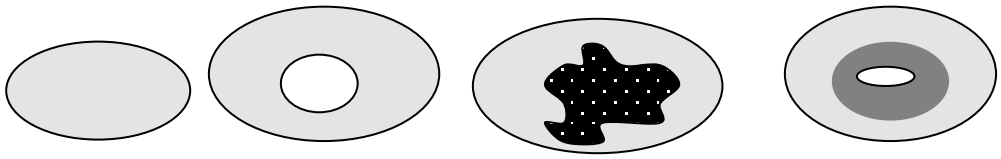
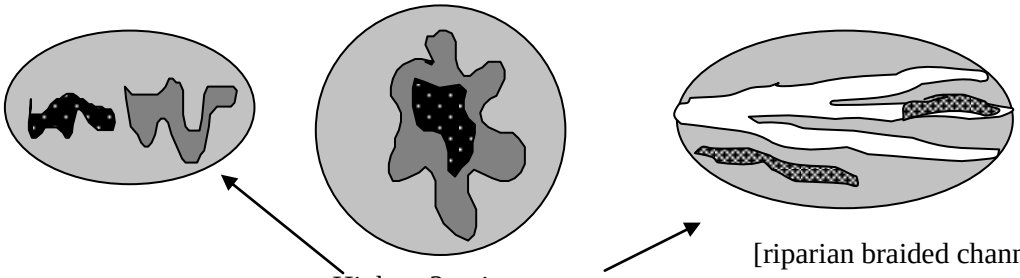
Comments:

D	**Depressional and Flats Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation	**Points** (only 1 score per box)
	D 3. Does the wetland unit have the <u>potential</u> to reduce flooding and erosion?	***(see p.46)***
D	D 3.1 Characteristics of surface water flows out of the wetland unit Unit is a depression with no surface water leaving it (no outlet) points = 4 Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2 Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch points = 1 (*If ditch is not permanently flowing treat unit as "intermittently flowing"*) Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) points = 0	4
D	D 3.2 Depth of storage during wet periods *Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).* Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7 The wetland is a "headwater" wetland" points = 5 Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5 Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3 Unit is flat (yes to Q. 2 or Q. 7 on key) but has small depressions on the surface that trap water points = 1 Marks of ponding less than 0.5 ft points = 0	0
D	D 3.3 Contribution of wetland unit to storage in the watershed *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* The area of the basin is less than 10 times the area of unit points = 5 The area of the basin is 10 to 100 times the area of the unit points = 3 The area of the basin is more than 100 times the area of the unit points = 0 Entire unit is in the FLATS class points = 5	3
D	**Total for D 3** *Add the points in the boxes above*	7
D	**D 4. Does the wetland unit have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* — Wetland is in a headwater of a river or stream that has flooding problems — Wetland drains to a river or stream that has flooding problems ✓ Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems — Other **YES** multiplier is **2** **NO** multiplier is **1**	***(see p. 49)*** multiplier 2
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 ***Add score to table on p. 1***	**14**

Comments:

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit have the <u>potential</u> to provide habitat for many species?	
H 1.1 <u>Vegetation structure</u> ***(see p. 72)*** *Check the types of vegetation classes present (as defined by Cowardin)- Size threshold for each class is ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.* Aquatic bed ✓ Emergent plants Scrub/shrub (areas where shrubs have >30% cover) Forested (areas where trees have >30% cover) *If the unit has a forested class check if:* The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation structures that qualify. If you have:* 4 structures or more points = 4 3 structures points = 2 2 structures points = 1 1 structure points = 0 Map of Cowardin vegetation classes	**Figure ___** 0
H 1.2. <u>Hydroperiods</u> ***(see p. 73)*** *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* Permanently flooded or inundated — 4 or more types present points = 3 Seasonally flooded or inundated — 3 types present points = 2 Occasionally flooded or inundated — 2 types present point = 1 ✓ Saturated only — 1 type present points = 0 Permanently flowing stream or river in, or adjacent to, the wetland Seasonally flowing stream in, or adjacent to, the wetland ***Lake-fringe wetland* = 2 points** ***Freshwater tidal wetland* = 2 points** Map of hydroperiods	**Figure ___** 0
H 1.3. <u>Richness of Plant Species</u> ***(see p. 75)*** 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, Canadian Thistle* If you counted: > 19 species points = 2 *List species below if you want to:* 5 - 19 species points = 1 < 5 species points = 0	0

Total for page 0

H 1.4. Interspersion of habitats ***(see p. 76)*** Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  ✓ None = 0 points Low = 1 point Moderate = 2 points  High = 3 points [riparian braided channels] NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes	**Figure ___** 0
H 1.5. Special Habitat Features: ***(see p. 77)*** *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). Standing snags (diameter at the bottom > 4 inches) in the wetland Undercut banks are present for at least 6.6 ft (2m) and/or overhanging vegetation extends at least 3.3 ft (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft (10m) Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* At least ¼ acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated.*(structures for egg-laying by amphibians)* ✓ Invasive plants cover less than 25% of the wetland area in each stratum of plants *NOTE: The 20% stated in early printings of the manual on page 78 is an error.*	1
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	1

Comments

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
H 2.1 Buffers ***(see p. 80)*** *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."* — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer**.** (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** — 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** ✓ — No paved areas or buildings within 50m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — Heavy grazing in buffer. **Points = 1** — Vegetated buffers are <2m wide (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0**. — Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	**Figure ___** 2
H 2.2 Corridors and Connections ***(see p. 81)*** H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft wide, has at least 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? (*dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor*). YES = **4 points** (*go to H 2.3*) NO = go to H 2.2.2 H 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** (*go to H 2.3*) NO = H 2.2.3 H 2.2.3 Is the wetland: within 5 mi (8km) of a brackish or salt water estuary OR within 3 mi of a large field or pasture (>40 acres) OR ✓ within 1 mi of a lake greater than 20 acres? ✓ YES = **1 point** NO = **0 points**	1

Total for page 3

H 2.3 Near or adjacent to other priority habitats listed by WDFW ***(see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report http://wdfw.wa.gov/hab/phslist.htm)*** Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* ____**Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre). ____**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 p. 152*). ____**Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock. ____**Old-growth/Mature forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age. **(**Mature forests) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 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 of the Cascade crest. _**Oregon white Oak:** Woodlands 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*). ✓ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other. ____**Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161*). ✓ **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. ____ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report: pp. 167-169 and glossary in Appendix A).* **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 7.6 m (25 ft) high and occurring below 5000 ft. ____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), 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 > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long. If wetland has **3 or more** priority habitats **= 4 points** If wetland has **2** priority habitats = **3 points** If wetland has **1** priority habitat **= 1 point** No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	3

H 2.4 Wetland Landscape *(choose the **one** description of the landscape around the wetland that best fits)* ***(see p. 84)*** There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 There is at least 1 wetland within ½ mile. points = 2 There are no wetlands within ½ mile. points = 0	3
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	9
TOTAL for H 1 from page 14	1
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	**10**

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate answers and Category.

Wetland Type *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	**Category**
SC 1.0 Estuarine wetlands *(see p. 86)* Does the wetland unit meet the following criteria for Estuarine wetlands? — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt. YES Go to SC 1.1 NO ✓	
SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? YES Category I NO go to SC 1.2	
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three conditions? YES Category I NO Category II — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native *Spartina* spp. are the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	No

SC 2.0 Natural Heritage Wetlands ***(see p. 87)*** Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? *(this question is used to screen out most sites before you need to contact WNHP/DNR)* S/T/R information from Appendix D or accessed from WNHP/DNR web site YES____ contact WNHP/DNR (see p. 79) and go to SC 2.2 NO ___ SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? YES Category I NO __✓__not a Heritage Wetland	No
SC 3.0 Bogs ***(see p. 87)*** Does the wetland unit (**or any part of the unit**) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 No - go to Q. 2 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? Yes - go to Q. 3 ✓ No - Is not a bog for purpose of rating 3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)? Yes Is a bog for purpose of rating No - go to Q. 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" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. YES Category I No__✓__ Is not a bog for purpose of rating	No

SC 4.0 Forested Wetlands *(see p. 90)* Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *If you answer yes you will still need to rate the wetland based on its functions.* — **Old-growth forests**: (west of Cascade crest) Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm) or more. NOTE: The criterion for dbh is based on measurements for upland forests. Two-hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The DFW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter. — **Mature forests**: (west of the Cascade Crest) Stands where the largest trees are 80 200 years old OR have average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth. YES = Category I NO ✓ not a forested wetland with special characteristics	No
SC 5.0 Wetlands in Coastal Lagoons *(see p. 91)* Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks — The lagoon in which the wetland is located contains surface water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* YES Go to SC 5.1 NO_✓_ not a wetland in a coastal lagoon SC 5.1 Does the wetland meets all of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of invasive plant species (see list of invasive species on p. 74). — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland is larger than 1/10 acre (4350 square feet) YES Category I NO Category II	No

SC 6.0 Interdunal Wetlands ***(see p. 93)*** Is the wetland unit west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? YES - go to SC 6.1 NO ✓ not an interdunal wetland for rating ***If you answer yes you will still need to rate the wetland based on its functions.*** In practical terms that means the following geographic areas: • Long Beach Peninsula- lands west of SR 103 • Grayland-Westport- lands west of SR 105 • Ocean Shores-Copalis- lands west of SR 115 and SR 109 SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is once acre or larger? YES Category II NO go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? YES Category III	No
Category of wetland based on Special Characteristics *Choose the "highest" rating if wetland falls into several categories, and record on p. 1.* If you answered NO for all types enter "Not Applicable" on p.1	**NA**

Wetland name or number **TAL-1147 Wetland K**

WETLAND RATING FORM – WESTERN WASHINGTON
Version 2 - Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): TAL- 1147 Wetland K Date of site visit: 04-30-15

Rated by DRt Trained by Ecology? Yes ✓ No___ Date of training 10-05

SEC: 8 TWNSHP: 25N RNGE: 6E Is S/T/R in Appendix D? Yes___ No ✓

Map of wetland unit: Figure ____ Estimated size _____

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III___ IV ✓

Category I Score > 70
Category II Score 51-69
Category III Score 30-50
Category IV Score < 30

Score for Water Quality Functions	3
Score for Hydrologic Functions	14
Score for Habitat Functions	11
TOTAL score for Functions	**28**

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ Does not Apply ✓

Final Category (choose the "highest" category from above) **Cat. IV**

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		**Wetland HGM Class used for Rating**	
Estuarine		**Depressional**	✓
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	✓	Check if unit has multiple HGM classes present	

Does the wetland unit being rated meet any of the criteria below?

If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered* ***animal or plant*** *species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.		✓
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered* ***animal*** *species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category I Natural Heritage Wetlands (see p. 19 of data form).		✓
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*		✓
SP4. *Does the wetland unit have a local significance in addition to its functions*? For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.		✓

To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Classification of Wetland Units in Western Washington

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 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
✓ NO go to 2 **YES** the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe NO – Saltwater Tidal Fringe (Estuarine)**

*If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is rated as an **Estuarine** wetland.* Wetlands that were called estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p.).

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
✓ NO go to 3 **YES** The wetland class is **Flats**

If your wetland can be classified as a "Flats" wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet both** of the following criteria?
___The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) at least 20 acres (8 ha) in size;
___At least 30% of the open water area is deeper than 6.6 ft (2 m)?
✓ NO go to 4 **YES –** The wetland class is **Lake-fringe (Lacustrine Fringe)**

4. 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**?
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 <3ft diameter and less than 1 foot deep).*
✓ NO - go to 5 **YES –** The wetland class is **Slope**

5. 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 two years.

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

✓ NO - go to 6 **YES** The wetland class is **Riverine**

6. 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 7 ✓ **YES –** The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding. The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

✓ NO go to 8 **YES** The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. 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 1-7 APPLY TO DIFFERENT AREAS IN THE 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 your wetland. 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 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 along stream within boundary	Depressional
Depressional + Lake-fringe	Depressional
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE under wetlands with special characteristics

If you are unable still 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 TAL-1147 Wetland K

D	**Depressional and Flats Wetlands** **WATER QUALITY FUNCTIONS** - Indicators that the wetland unit functions to improve water quality	**Points** (only 1 score per box)
D	**D 1. Does the wetland unit have the <u>potential</u> to improve water quality?**	***(see p.38)***
D	D 1.1 Characteristics of surface water flows out of the wetland: Unit is a depression with no surface water leaving it (no outlet) points = 3 Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2 Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) points = 1 Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch points = 1 (*If ditch is not permanently flowing treat unit as "intermittently flowing"*) Provide photo or drawing	**Figure ___** 3
D	S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic *(use NRCS definitions)* YES points = 4 NO points = 0	0
D	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class) Wetland has persistent, ungrazed, vegetation > = 95% of area points = 5 Wetland has persistent, ungrazed, vegetation > = 1/2 of area points = 3 Wetland has persistent, ungrazed vegetation > = 1/10 of area points = 1 Wetland has persistent, ungrazed vegetation <1/10 of area points = 0 Map of Cowardin vegetation classes	**Figure ___** 0
D	D1.4 Characteristics of seasonal ponding or inundation. *This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.* Area seasonally ponded is > ½ total area of wetland points = 4 Area seasonally ponded is > ¼ total area of wetland points = 2 Area seasonally ponded is < ¼ total area of wetland points = 0 Map of Hydroperiods	**Figure ___** 0
D	**Total for D 1** *Add the points in the boxes above*	3
D	**D 2. Does the wetland unit have the <u>opportunity</u> to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* — Grazing in the wetland or within 150 ft — Untreated stormwater discharges to wetland — Tilled fields or orchards within 150 ft of wetland — A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other **YES** multiplier is **2** **NO** multiplier is **1**	***(see p. 44)*** multiplier 1
D	**<u>TOTAL</u> - Water Quality Functions** Multiply the score from D1 by D2 ***Add score to table on p. 1***	3

Comments:

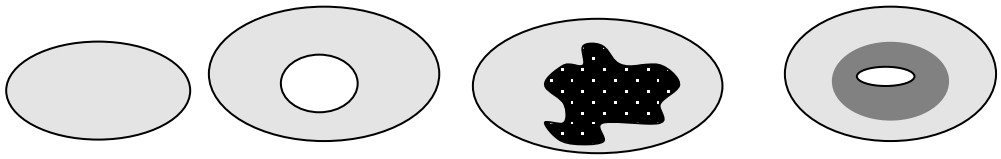
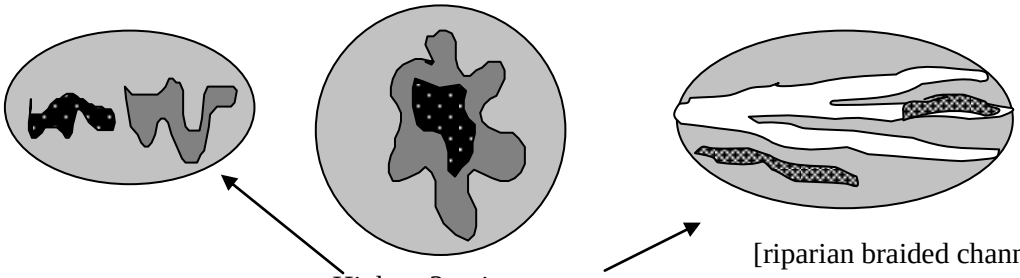
Wetland name or number TAL-1147 Wetland K

D	**Depressional and Flats Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation	**Points** (only 1 score per box)
	D 3. Does the wetland unit have the <u>potential</u> to reduce flooding and erosion?	***(see p.46)***
D	D 3.1 Characteristics of surface water flows out of the wetland unit Unit is a depression with no surface water leaving it (no outlet) points = 4 Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2 Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch points = 1 (*If ditch is not permanently flowing treat unit as "intermittently flowing"*) Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) points = 0	4
D	D 3.2 Depth of storage during wet periods *Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).* Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7 The wetland is a "headwater" wetland" points = 5 Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5 Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3 Unit is flat (yes to Q. 2 or Q. 7 on key) but has small depressions on the surface that trap water points = 1 Marks of ponding less than 0.5 ft points = 0	0
D	D 3.3 Contribution of wetland unit to storage in the watershed *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* The area of the basin is less than 10 times the area of unit points = 5 The area of the basin is 10 to 100 times the area of the unit points = 3 The area of the basin is more than 100 times the area of the unit points = 0 Entire unit is in the FLATS class points = 5	3
D	**Total for D 3** *Add the points in the boxes above*	7
D	**D 4. Does the wetland unit have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* — Wetland is in a headwater of a river or stream that has flooding problems ✓ Wetland drains to a river or stream that has flooding problems — Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems — Other **YES** multiplier is **2** **NO** multiplier is **1**	***(see p. 49)*** multiplier 2
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 ***Add score to table on p. 1***	**14**

Comments:

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit have the <u>potential</u> to provide habitat for many species?	
H 1.1 <u>Vegetation structure</u> ***(see p. 72)*** *Check the types of vegetation classes present (as defined by Cowardin)- Size threshold for each class is ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.* Aquatic bed ✓ Emergent plants Scrub/shrub (areas where shrubs have >30% cover) Forested (areas where trees have >30% cover) *If the unit has a forested class check if:* The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation structures that qualify. If you have:* 4 structures or more points = 4 3 structures points = 2 2 structures points = 1 1 structure points = 0 Map of Cowardin vegetation classes	**Figure ___** 0
H 1.2. <u>Hydroperiods</u> ***(see p. 73)*** *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* Permanently flooded or inundated — 4 or more types present points = 3 Seasonally flooded or inundated — 3 types present points = 2 Occasionally flooded or inundated — 2 types present point = 1 ✓ Saturated only — 1 type present points = 0 ✓ Permanently flowing stream or river in, or adjacent to, the wetland Seasonally flowing stream in, or adjacent to, the wetland ***Lake-fringe wetland* = 2 points** ***Freshwater tidal wetland* = 2 points** Map of hydroperiods	**Figure ___** 1
H 1.3. <u>Richness of Plant Species</u> ***(see p. 75)*** 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, Canadian Thistle* If you counted: > 19 species points = 2 *List species below if you want to:* 5 - 19 species points = 1 < 5 species points = 0	0

Total for page 1

H 1.4. Interspersion of habitats ***(see p. 76)*** Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  ✓ None = 0 points Low = 1 point Moderate = 2 points  High = 3 points [riparian braided channels] NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes	**Figure ___** 0
H 1.5. Special Habitat Features: ***(see p. 77)*** *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). Standing snags (diameter at the bottom > 4 inches) in the wetland Undercut banks are present for at least 6.6 ft (2m) and/or overhanging vegetation extends at least 3.3 ft (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft (10m) Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* At least ¼ acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated.*(structures for egg-laying by amphibians)* ✓ Invasive plants cover less than 25% of the wetland area in each stratum of plants *NOTE: The 20% stated in early printings of the manual on page 78 is an error.*	1
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	2

Comments

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
H 2.1 Buffers ***(see p. 80)*** *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."* — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer**.** (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** — 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** ✓ — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — No paved areas or buildings within 50m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — Heavy grazing in buffer. **Points = 1** — Vegetated buffers are <2m wide (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0**. — Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	**Figure ___** 2
H 2.2 Corridors and Connections ***(see p. 81)*** H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft wide, has at least 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? (*dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor*). YES = **4 points** (*go to H 2.3*) NO = go to H 2.2.2 H 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** (*go to H 2.3*) NO = H 2.2.3 H 2.2.3 Is the wetland: within 5 mi (8km) of a brackish or salt water estuary OR within 3 mi of a large field or pasture (>40 acres) OR ✓ within 1 mi of a lake greater than 20 acres? ✓ YES = **1 point** NO = **0 points**	1

Total for page 3

H 2.3 Near or adjacent to other priority habitats listed by WDFW ***(see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report http://wdfw.wa.gov/hab/phslist.htm)*** Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* ____**Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre). ____**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 p. 152*). ____**Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock. ____**Old-growth/Mature forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age. **(**Mature forests) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 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 of the Cascade crest. _**Oregon white Oak:** Woodlands 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*). ✓ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other. ____**Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161*). ✓ **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. ____ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report: pp. 167-169 and glossary in Appendix A).* **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 7.6 m (25 ft) high and occurring below 5000 ft. ____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), 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 > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long. If wetland has **3 or more** priority habitats **= 4 points** If wetland has **2** priority habitats = **3 points** If wetland has **1** priority habitat **= 1 point** No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	3

H 2.4 Wetland Landscape *(choose the **one** description of the landscape around the wetland that best fits*) ***(see p. 84)*** There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 There is at least 1 wetland within ½ mile. points = 2 There are no wetlands within ½ mile. points = 0	3
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	9
TOTAL for H 1 from page 14	2
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	**11**

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate answers and Category.

Wetland Type *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	**Category**
SC 1.0 Estuarine wetlands *(see p. 86)* Does the wetland unit meet the following criteria for Estuarine wetlands? — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt. YES Go to SC 1.1 NO ✓	
SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? YES Category I NO go to SC 1.2	
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three conditions? YES Category I NO Category II — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native *Spartina* spp. are the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	No

SC 2.0 Natural Heritage Wetlands ***(see p. 87)*** Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? *(this question is used to screen out most sites before you need to contact WNHP/DNR)* S/T/R information from Appendix D or accessed from WNHP/DNR web site YES____ contact WNHP/DNR (see p. 79) and go to SC 2.2 NO ___ SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? YES Category I NO __✓__not a Heritage Wetland	No
SC 3.0 Bogs ***(see p. 87)*** Does the wetland unit (**or any part of the unit**) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 No - go to Q. 2 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? Yes - go to Q. 3 ✓ No - Is not a bog for purpose of rating 3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)? Yes Is a bog for purpose of rating No - go to Q. 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" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. YES Category I No__✓__ Is not a bog for purpose of rating	No

SC 4.0 Forested Wetlands *(see p. 90)* Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *If you answer yes you will still need to rate the wetland based on its functions.* — **Old-growth forests**: (west of Cascade crest) Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm) or more. NOTE: The criterion for dbh is based on measurements for upland forests. Two-hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The DFW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter. — **Mature forests**: (west of the Cascade Crest) Stands where the largest trees are 80 200 years old OR have average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth. YES = Category I NO ✓ not a forested wetland with special characteristics	No
SC 5.0 Wetlands in Coastal Lagoons *(see p. 91)* Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks — The lagoon in which the wetland is located contains surface water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* YES Go to SC 5.1 NO_✓_ not a wetland in a coastal lagoon SC 5.1 Does the wetland meets all of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of invasive plant species (see list of invasive species on p. 74). — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland is larger than 1/10 acre (4350 square feet) YES Category I NO Category II	No

SC 6.0 Interdunal Wetlands ***(see p. 93)*** Is the wetland unit west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? YES - go to SC 6.1 NO ✓ not an interdunal wetland for rating ***If you answer yes you will still need to rate the wetland based on its functions.*** In practical terms that means the following geographic areas: • Long Beach Peninsula- lands west of SR 103 • Grayland-Westport- lands west of SR 105 • Ocean Shores-Copalis- lands west of SR 115 and SR 109 SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is once acre or larger? YES = Category II NO – go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? YES = Category III	No
Category of wetland based on Special Characteristics *Choose the "highest" rating if wetland falls into several categories, and record on p. 1.* If you answered NO for all types enter "Not Applicable" on p.1	**NA**

Appendix F

Final Restoration & Mitigation Work Plan

(prepared by Talasaea Consultants)

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FINAL RESTORATION AND MITIGATION WORK PLAN

GUNSHY MANOR FARM
KING COUNTY, WASHINGTON

EPA DOCKET NO. CWA-10-2016-0087

Prepared For:
THE ESTATE OF BARBARA J. NELSON
Redmond, Washington

Prepared By:
TALASAEA CONSULTANTS, INC.
Woodinville, Washington

28 March 2016
(Revised 16 August 2017)

EPA Final Restoration and Mitigation Work Plan

Gunshy Manor Farm
King County, Washington

EPA Docket No. CWA-10-2016-0087

Prepared For:
The Estate of Barbara J. Nelson
16508 NE 79th Street
Redmond, Washington 98072

Prepared By:
Talasaea Consultants, Inc.
150250 Bear Creek Road NE
Woodinville, Washington 98077
(425) 861-7550

28 March 2016
(Revised 16 August 2017)

EXECUTIVE SUMMARY

REPORT TYPE: Mitigation Plan

REPORT NAME: Gunshy Manor Final Restoration and Mitigation Work Plan

SYNOPSIS OF REPORT UPDATE: This report is an update of our report submitted to the EPA on 9/16/2016 based on mitigation design modifications resulting from agency discussions and revisions to the Critical Areas Report, dated 1 June 2017.

LOCATION: The Property is an irregularly-shaped, approximately 124-acre, group of six parcels located south of and abutting NE Union Hill Road, abutting and extending approximately 1,300 feet east from 196th Avenue in King County, Washington. The King County tax parcels that comprise the Property are 0825069013 (Parcel A), 0825069103 (Parcel B), 0825069104 (Parcel C), 0825069105 (Parcel D), 0825069012 (Parcel E), and 0825069102 (Parcel F). The Public Land Survey System location is the NW ¼ of Section 8, T25N, R6E, Willamette Meridian.

REPORT STAFF: Bill Shiels, Principal; David R. Teesdale, PWS, Senior Wetland Ecologist; Jennifer M. Marriott, PWS, Senior Ecologist.

CLIENT: The Estate of Barbara J. Nelson.

PROPERTY USE: An approximately 66-acre portion of the Property is currently developed with a single-family residence, a guest house, associated outbuildings and storage sheds, barns, and farm fields used for livestock grazing and hay production.

DETERMINATION: Details on the critical areas located within the Property are provided in the Critical Areas Report for Gunshy Manor, dated 1 June 2017.

MITIGATION PLAN: Proposed mitigation will include the following mitigation elements:

- Lowering the elevation of the Spur Farm Road;
- Removing gravel from critical area buffers;
- Reducing the widths of, and replacing the gravel used in the Loop and Burn Pile Farm Roads;
- Adding a meander to Farm Ditch D1;
- Removing designated catch basins;
- Replacing existing culvert with fish-friendly crossing; and
- Planting native species throughout the Property at targeted areas as agreed upon, including segments of Evans Creek.

A summary of mitigation elements is contained in **Chapter 1.2** of this report. The performance monitoring and maintenance associated with each mitigation element is contained in **Chapters 2, 3, 4, 5, and 6** of this report.

REPORT'S INTENDED USE: This report is prepared as part of settlements with the Environmental Protection Agency and the Washington State Department of Ecology as referenced in EPA Docket No. CWA-10-2016-0087 and in Washington State Department of Ecology Agreed Administrative Order Docket # 13182.

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TABLE OF CONTENTS

Executive Summary i
Table of Contents ii
Tables and Exhibits iv

Chapter 1. Introduction and Purpose 1
1.1 Work 1
1.2 Mitigation Design Elements 1
1.3 Property Survey 2
Chapter 2. Farm Ditch D1 Meander 2
2.1 Agencies Involved 2
2.2 Purpose and Area Where Activities Will Occur 2
2.3 Description of How Work Will be Completed 3
2.3.1 Task Schedule 3
2.3.2 List of Heavy Earthmoving Equipment to be Used 3
2.3.3 Name(s) and Contact Information for Person(s) and/or Contractor(s) that will complete the Work 3
2.3.4 Process for Meandering Farm Ditch D1 and Vegetating Area 3
2.3.5 Upland Disposal Area 3
2.3.6 List of Best Management Practices 3
2.3.7 Monitoring Plan 4
2.3.7.1 Performance Monitoring Guidelines 5
2.3.7.2 Hydrologic (Flow) Monitoring 5
2.3.7.3 Turbidity Monitoring 6
2.3.8 Performance Standards 6
2.3.9 Contingency Measures 6
Chapter 3. Spur Farm Road, Loop Farm Road, and Burn Pile Farm Road Modifications 7
3.1 Agencies Involved 7
3.2 Purpose and Area Where Activities Will Occur 7
3.3 Description of How Work Will be Completed 7
3.3.1 Task Schedule 8
3.3.2 List of Heavy Earthmoving Equipment to be Used 8
3.3.3 Name(s) and Contact Information for Person(s) and/or Contractor(s) that will Complete the Work 8
3.3.4 Process for Removing Gravel and Fill and Vegetating Area 8
3.3.5 Upland Disposal Area 8
3.3.6 List of Best Management Practices 9
3.3.7 Monitoring Plan 9
3.3.8 Performance Standards 9
3.3.9 Contingency Measures 10
Chapter 4. Catch Basin Removal (Doublewide Pasture) 10
4.1 Agencies Involved 10
4.2 Purpose and Area Where Activities Will Occur 10
4.3 Description of How Work Will be Completed 10

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4.3.1 Task Schedule ... 10
4.3.2 List of Heavy Earthmoving Equipment to be Used ... 10
4.3.3 Name(s) and Contact Information for Person(s) and/or Contractor(s) that will Complete the Work ... 11
4.3.4 Process for Removing Gravel and Fill and Vegetating Area ... 11
4.3.5 List of Best Management Practices ... 11
4.3.6 Monitoring Plan ... 11
4.3.7 Performance Standards ... 12
4.3.8 Contingency Measures ... 12
Chapter 5. Culvert Replacement - Farm Ditch D1 ... 12
5.1 Agencies Involved ... 12
5.2 Purpose and Area Where Activities Will Occur ... 12
5.3 Description of How Work Will be Completed ... 12
5.3.1 Task Schedule ... 12
5.3.2 List of Heavy Earthmoving Equipment to be Used ... 13
5.3.3 Name(s) and Contact Information for Person(s) and/or Contractor(s) that will Complete the Work ... 13
5.3.4 Process for Removing Gravel and Fill and Vegetating Area ... 13
5.3.5 List of Best Management Practices ... 13
5.3.6 Monitoring Plan ... 13
5.3.7 Performance Standards ... 14
5.3.8 Contingency Measures ... 14
Chapter 6. Plantings - Vegetation Plan ... 14
6.1 Agencies Involved ... 14
6.2 Purpose and Area Where Activities Will Occur ... 14
6.3 Description of How Work Will be Completed ... 15
6.3.1 Task Schedule ... 15
6.3.2 List of Heavy Earthmoving Equipment to be Used ... 15
6.3.3 Name(s) and Contact Information for Person(s) and/or Contractor(s) that will Complete the Work ... 15
6.3.4 List of Best Management Practices ... 15
6.4 Monitoring Plan ... 16
6.4.1 Performance Monitoring Guidelines ... 16
6.4.2 Maintenance Reviews ... 17
6.4.3 Temporary Irrigation System ... 18
6.4.4 Performance Standards ... 18
6.4.5 Contingency Measures ... 18
Chapter 7. Proposed Schedule ... 19
Chapter 8. Notifications and Reports ... 20
8.1 Notifications to EPA ... 20
8.2 Completion Report ... 20
8.3 Annual Reports ... 20

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TABLES

Table 1. Summary of Mitigation Elements. 2

Table 2. Projected Schedule for Performance Monitoring and Maintenance Events 5

Table 3. Projected Schedule for Performance Monitoring and Maintenance Events ... 16

EXHIBITS

Exhibit A: Gunshy Manor Farm Work Plan (As Prepared by ESM)

Exhibit B: Vegetation Plan

Exhibit C: Property Survey (As Prepared by ESM)

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CHAPTER 1. INTRODUCTION AND PURPOSE

This Restoration and Mitigation Work Plan ("Work Plan") is prepared to satisfy requirements of the US Environmental Protection Agency (EPA) Administrative Order on Consent ("AOC"), Docket No. CWA-10-2016-0087and the Washington State Department of Ecology Agreed Administrative Order Docket # 13182.

1.1 Work

The restoration and mitigation work documented in this Plan is described more specifically below and in the documents entitled "Gunshy Manor Farm Work Plan," attached as **Exhibit A** and the "Vegetation Plan," attached as **Exhibit B**.

Where permits or approvals are required to complete the work, the Applicant will obtain those permits through the appropriate regulatory agencies.

1.2 Mitigation Design Elements

The following mitigation elements were discussed with all involved agency staff through a series of communications and meetings with the EPA, and are presented below in their current form. **Table 1** lists the mitigation elements by agency, with a discussion of each element following in Chapter 2.1 below. Details of each mitigation element, including where the work will occur, how the work will be completed, and the subsequent monitoring plans are provided in the following chapters.

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Table 1. Summary of Mitigation Elements.

Mitigation Element	EPA	DOE	King County
Farm Ditch D1 Meander (South Farm Ditch)	X		X
Spur Farm Road*	X		X
Loop Farm Road*	X		X
Burn Pile Farm Road*	X		X
Catch Basin Removal (Doublewide Pasture)	X		
Culvert Removal and Crossing Installation (Farm Ditch D1, aka South Farm Ditch)	X		
Plantings (multiple locations)	X	X	

*These road modifications are discussed together below as the essential components of these mitigation elements are similar.

1.3 Property Survey

Attached as **Exhibit C** is a scaled Property survey, sketch(s) and/or drawing(s), depicting the Property's features and boundaries ("Property Survey") for purposes of locating the restoration and mitigation activities.

CHAPTER 2. FARM DITCH D1 MEANDER

2.1 Agencies Involved

This mitigation element is being provided to EPA and King County. Authorization by the US Army Corps of Engineers (Corps) and the Washington Department of Fish and Wildlife (WDFW) is expected for this mitigation task as work within a fish-bearing waterbody is proposed.

2.2 Purpose and Area Where Activities Will Occur

A small segment of the Farm Ditch D1, also known as South Farm Ditch, will be realigned to restore a previous meander. The proposed realignment will occur between Wetlands B and E as described in **Exhibit A**. The dimensions (length, width and depth) of the realigned Farm Ditch D1 are outlined in **Exhibit A**. The total length of the realigned portion of the Farm Ditch D1 is approximately 200 feet.

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Plantings of native tree and shrub species will be conducted in association with this activity. The details of the monitoring plan relating to these plantings are outlined within Chapter 4 below.

2.3 Description of How Work Will be Completed

2.3.1 Task Schedule

Assuming all permits have been obtained, work on this portion of the project is estimated to begin in summer of 2017, when the water level in the Farm Ditch D1 is either dry, or at its lowest level.

2.3.2 List of Heavy Earthmoving Equipment to be Used

Mini-excavator, dump truck, skidster, and excavator. Heavy earthmoving equipment will access the Farm to conduct the Work from the Union Hill Road entrance.

2.3.3 Name(s) and Contact Information for Person(s) and/or Contractor(s) that will complete the Work

Robert Bailie, Cascade Utilities, 7600 185th Ave. NE, Redmond, WA 98052; (425) 861-8787.

2.3.4 Process for Meandering Farm Ditch D1 and Vegetating Area

The meander will be configured to match the existing slope and grade of the adjacent existing Farm Ditches D1 and D2. Materials excavated to create the meander portion will be used to fill the portion of the ditch to be abandoned. Excess material is anticipated from this portion of the project and will be used to replace gravel that will be removed from the Loop Farm Road, as outlined in Chapter 3 below. Farm ditches on Gunshy Manor Farm will continue to be maintained according to normal farming practices, as needed, such as routine minor maintenance of farm ditches by hand-pulling, using hand-held tools or equipment, or using equipment that is carried when used. Hydroseeding of exposed soil will occur after completion of construction. Plantings associated with the Farm Ditch D1 are outlined within **Exhibit B** and described below in Chapter 4.

2.3.5 Upland Disposal Area

Any excess material from this project will be minimal and used to backfill the areas along the Loop Farm Road where gravel will be removed. Excess material will not be placed in wetlands or wetland buffers.

2.3.6 List of Best Management Practices

Work will be completed in the late summer to reduce the likelihood of runoff from exposed soils during construction. Prior to construction, the Contractor will install orange filter fabric fences around all areas of disturbance that may result in sediment entering the farm ditches or adjacent wetlands. Additional Best Management Practices (BMPs) will be followed for the Farm Ditch D1 realignment as outlined in King County's *Agricultural Drainage Assistance Program* as approved by WDFW, dated December 13, 2011, as well as WDFW's pamphlet on *Aquatic Plants and Fish*, dated July 2015.

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Two temporary dams will be installed at either end of the reach of the Farm Ditch D1 to be abandoned. This will create a fish exclusion zone and will serve to allow dewatering of the proposed work area. The dams will be constructed of sand bags, impermeable geotextile fabric, and hogwire fencing. The hogwire fencing will provide adequate structural support for the geotextile fabric and the sand bags will be used to seal the base of the dam.

During construction, access to the work area must be maintained for a variety of heavy equipment and vehicles. It is important to protect soil and existing vegetation from damage to the maximum extent practicable. Access to the construction area for heavy equipment and vehicles will be clearly defined in the field.

The new Farm Ditch D1 meander and the old abandoned and filled channel will be hydroseeded at the conclusion of construction. Bare soil along the new channel and the abandoned and filled old channel will be hydroseeded to prevent erosion. The hydroseeding along the old abandoned channel will return that portion of the property into hay production. Revegetation of the new ditch channel per the Vegetation Plan (**Exhibit B**) will occur during the late summer or early fall. The temporary dams will be removed from the Farm Ditch D1 after hydroseeded grasses become established.

At the conclusion of the ditch meander work, soil and vegetation damaged (if any) will be revegetated by hydroseeding to return the area back into farm production. When soils around the ditch meander area are stabilized through revegetation (or as determined by Talasaea Consultants), orange filter fabric fencing will be removed and disposed of at an off-site facility.

The proposed project will implement BMPs during construction to minimize impacts to the on-site critical areas during the construction process. Stormwater and erosion control BMPs to be implemented for the proposed project may include, but are not limited to:

- Site runoff containment;
- Silt fences;
- Straw bale dams;
- Rock check dams;
- Erosion control mesh, netting, seeding, or other cover for exposed soils;
- Rocked road entries; and covered, seeded, or otherwise stabilized soil stockpiles.

2.3.7 Monitoring Plan

The following monitoring will be conducted for a period of five (5) years. Hydrologic (flow) monitoring and turbidity monitoring will be conducted concurrently with the vegetation plantings performance monitoring after the installation of the meander. Monitoring of plantings will occur for a minimum of five (5) years according to the schedule presented in **Table 2** below, and are outlined in more detail in Chapter 6. Performance monitoring will be conducted according to all applicable code, regulatory requirements, and permit conditions.

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Table 2. Projected Schedule for Performance Monitoring and Maintenance Events

Year	Date	Maintenance Review	Performance Monitoring	Report Due to Agencies
Completion Report (includes As-built drawings and baseline assessment data)	Within 14 days of completing activity			X
Year 1 (includes As-built drawings and baseline assessment data)	Fall	X	X	X
Year 2	Spring	X	X	
	Fall	X	X	X
Year 3	Spring	X	X	
	Fall	X	X	
Year 4	Spring	X		
	Fall	X	X	X
Year 5	Spring	X		
	Fall	X	X	X

All monitoring will be performed by a qualified biologist or ecologist. Data collected during the fall monitoring event will be used in that year's Anniversary report to the EPA and other jurisdictional agencies. These data will be compared with baseline data and data collected from previous years monitoring events to illustrate the Property's progress towards success. All comparisons and conclusions will be based on the project's stated performance standards.

2.3.7.1 Performance Monitoring Guidelines

At the conclusion of construction, a minimum of 1 permanent photo station will be established to show the progress of the mitigation throughout the years of monitoring. Photos will be taken of the mitigation areas and included in the as-built (Completion) report to be sent to EPA and other jurisdictional agencies after completion of the realignment of the ditch. Photos will be taken in subsequent years at these permanent photo stations to be included in each Anniversary report, including a photo location graphic, as appropriate, for the respective element of the Mitigation Plan.

2.3.7.2 Hydrologic (Flow) Monitoring

Flow monitoring will be provided using a flow meter and a staff gauge over the course of the 5-year performance monitoring. A staff gauge will be installed at the northern end of the meander to record water elevations to provide ease of relating flow to water levels. Water levels at this staff gauge can be noted concurrent with performance monitoring events for turbidity monitoring.

A permanent transect across the ditch will be established to identify the location of future flow measurements. This transect will be measured such that a cross section of the ditch can be prepared. Flow levels will be measured at this location a minimum of twice per year concurrent with performance monitoring events or turbidity monitoring. A flow curve can be prepared for this ditch once enough data has been collected to determine how this ditch is functioning.

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Baseline conditions for water level elevations and flow patterns within Farm Ditch D1 will be established through a single data collection event prior to the initiation of construction of the meander.

2.3.7.3 Turbidity Monitoring

Turbidity monitoring will be conducted concurrent with construction activities and for 5 years after completion of construction at an established location within the ditch near its confluence with Farm Ditch D2. A baseline assessment will be conducted prior to initiation of construction activities to determine the baseline turbidity within this ditch. Turbidity monitoring will be conducted daily while construction activities are ongoing. Once construction is complete, turbidity monitoring will occur during normal performance monitoring twice a year and after any rain event greater than ½" per 24-hour period.

2.3.8 Performance Standards

The following performance standards shall apply for the meander of the Farm Ditch D1:

- **Hydrologic (Flow) Monitoring**. Farm Ditch D1 will be monitored for flow rates using a flow meter and staff gauge. Results will be recorded and presented to the Agencies to reflect the post-construction conditions of the ditch. The flow within South Farm Ditch will be no less than that outlined in the baseline conditions.
- **Turbidity Monitoring.** Farm Ditch D1 will be monitored for turbidity levels during construction and for 5 years after completion of construction. Results will be compared to the baseline assessment, completed prior to the initiation of construction, to determine if turbidity levels are within the normal limits for this ditch.
- **Ditch bank stability**. The Farm Ditch D1 Meander will be evaluated during each monitoring event for evidence of erosion or sloughing. Such evidence will be photographed and its extent along the bank measured. Talasaea will collaborate with the Project Engineer, the Client, and the jurisdictional agencies to determine the cause of the failure and to devise a solution to stabilize the bank.

2.3.9 Contingency Measures

Contingency measures are provided as potential solutions if performance standards are not being met for a given mitigation site. Contingency measures are most often used within the first 2 years of a mitigation site's lifetime, which is when most problems occur, barring Acts of God. The details and contingency measures relating to vegetation plantings are outlined in more detail in Chapter 6. The contingency measures outlined within Chapter 2 relate to the physical parameters of Farm Ditch D1 – bank stabilization, turbidity, and changes in flow. Any contingency measures would likely be noticed and required within the first year post-construction. Given the anticipated timeline of activities, we expect the performance standards for flow, turbidity, and bank stability to be met within 2 years following construction. If the performance standards referenced above are not being met, then the following contingency/adaptive management measures shall apply**.**

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- **Re-stabilization**. If the banks of Farm Ditch D1 show areas of instability, these areas will be restabilized using additional soil material, as necessary. Any exposed soil will be hydroseeded.
- **Turbidity Concerns**. If turbidity levels exceed the allowable thresholds identified through the baseline condition assessment, the source of the additional turbidity will be identified and addressed to the extent practicable. Talasaea will work with the Project Engineer, the Client, and the EPA (as well as other jurisdictional agencies) to determine the cause of excess turbidity. Corrective actions will be developed to address the excess turbidity upon approval by the EPA.
- **Flow Deviations**. Talasaea will work with the Project Engineer, the Client, and the EPA (as well as other jurisdictional agencies) to assess flows that deviate from the normal conditions established during the baseline condition assessment. Corrective actions will be developed to address the flow levels upon approval by the EPA.

CHAPTER 3. SPUR FARM ROAD, LOOP FARM ROAD, AND BURN PILE FARM ROAD MODIFICATIONS

3.1 Agencies Involved

This mitigation element is being provided to the EPA and King County. Coordination with WDFW will occur to verify that a Hydraulic Permit Application (HPA) is not required. The Applicant will submit the necessary information to receive an HPA should WDFW determine that an HPA is necessary.

3.2 Purpose and Area Where Activities Will Occur

The work on the Spur Farm Road, Loop Farm Road, and Burn Pile Farm Road will occur in the areas described on **Exhibit A**. Portions of the Spur Farm Road will be lowered by excavating and removing gravel and dirt to the proposed finished grade. Portions of the Loop Farm Road and Burn Pile Farm Road within critical area buffers will have the entire width of gravel removed and replaced with topsoil and pit run gravel to match existing grades. Topsoil will be placed generally along the outer edges and the pit run will be placed resulting in an 8-foot wide farm road within the original gravel road prism. These modifications will remove the existing gravel material and reduce the overall farm road width to approximately 8 feet. Estimated volumes of excavation and backfilling to accomplish the Farm Road Modifications are shown on **Exhibit A**.

3.3 Description of How Work Will be Completed

Portions of each identified farm road will be lowered by excavating and removing gravel and dirt as shown on **Exhibit A,** and replacing it with topsoil and pit run as shown on **Exhibit A**. Prior to construction, the Contractor will install orange fabric fences around work areas and install filter fabric in yard drains to prevent sediment from entering the adjacent ditches or wetlands.

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3.3.1 Task Schedule

Assuming all permits have been issued, work on this portion of the project would begin in summer of 2017, when water levels in the adjacent ditches are low and after the first crop of hay has been harvested.

3.3.2 List of Heavy Earthmoving Equipment to be Used

Excavator, dump truck, skidster, mini-excavator, bulldozer, roller and grader. Heavy earthmoving equipment will access the Farm to conduct the Work from the Union Hill Road entrance.

3.3.3 Name(s) and Contact Information for Person(s) and/or Contractor(s) that will Complete the Work

Robert Bailie, Cascade Utilities, 7600 185th Ave. NE., Redmond, WA 98052; (425) 861-8787.

3.3.4 Process for Removing Gravel and Fill and Vegetating Area

Portions of the identified farm roads will be modified as outlined on **Exhibit A**. This includes modifications to reduce the height and volume of the Spur Farm Road, reduce the widths of the Loop Farm and Burn Pile Farm Roads.

The Spur Farm Road will be reduced in height so that the finished grade will be lower than its current condition, as outlined on **Exhibit A**. Once the existing material is removed from the Spur Farm Road, the remaining material will not be compacted. The existing gravel material within those portions of the Loop and Burn Pile Farm Roads identified on Exhibit A will be removed and replaced with topsoil and pit run, resulting in a narrowed, approximately 8-foot wide farm road gravel surface. The road surface will be rolled and compacted. New topsoil and excess top soil from the Farm Ditch D1 meander will be placed along the outer edges of the 8-foot wide gravel farm road for reintroduction into hay production.

The new topsoil and pit run will be compacted enough so that the material stays in place and so that farm vehicles can travel the road without either getting stuck or creating ruts in the road. The disturbed areas along the modified farm roads will be prepared and seeded with a pasture seed mix or hydro-seeded for use in the continued production of hay. The Spur Farm Road will also be seeded with grass seed or hydro-seeded after removal of the material (**Exhibits A and B**).

3.3.5 Upland Disposal Area

The dirt and gravel removed from the Spur Farm Road will be used to backfill where the gravel is to be removed from the Loop Farm Road. Gravel removed from the Loop Farm Road will be used for regraveling of the upland farm road surface. A small volume, up to 10 cubic yards, will be stockpiled on-site for future regraveling of the upland farm road surfaces and filling potholes (as needed), as depicted on Exhibit A. After regraveling of the upland farm road and stockpiling the 10 cubic yards, any surplus gravel removed from the Loop Farm Road and Burn Pile Road will be hauled off-site for disposal at an approved receiving site. No gravel removed from the Loop Farm Road and Burn Pile Road will be placed into wetlands or wetland buffers.

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3.3.6 List of Best Management Practices

Assuming issuance of all needed permits, work will start in July to lessen the likelihood of runoff from exposed soils during construction. Prior to construction, the Contractor will install orange fabric fencing to define the limits of construction and to prevent mobilized soil, sediment, and other pollutants from entering the Farm Ditches or adjacent wetlands. At the conclusion of construction, the new Spur Farm Road bed will be hydroseeded to prevent erosion. All exposed soil along the farm roads will be reseeded with an appropriate pasture mix of grasses, thus permitting continued hay production.

The proposed project will implement BMPs during construction to minimize impacts to the on-site critical areas during the construction process. Stormwater and erosion control BMPs to be implemented for the proposed project may include, but are not limited to:

- Site runoff containment;
- Silt fences;
- Straw bale dams;
- Rock check dams;
- Erosion control mesh, netting, seeding, or other cover for exposed soils;
- Rocked road entries; and covered, seeded, or otherwise stabilized soil stockpiles.

3.3.7 Monitoring Plan

Permanent photo stations will be established within the Spur Farm Road, Loop Farm Road, and Burn Pile Farm Road construction areas prior to the commencement of any work. A minimum of 1 photo station will be established at each proposed road modification. Photos, including a photo location graphic, will be taken during the performance monitoring events outlined in **Table 2**. Photos will be included as figures in the report due to agencies.

The existing conditions of the construction areas will be thoroughly photo-documented. These permanent photo station locations will be used weekly to photo-document the progress of construction from initiation to completion. These photos will illustrate how work is proceeding in these areas and document the final conditions following the completion of construction work. Photo stations will be located outside of the work area, but will provide panoramic views of said areas and the work being accomplished. The photos showing the existing condition and the as-built condition will be used to confirm the successful completion of the required work.

3.3.8 Performance Standards

No performance standards are proposed for these Mitigation Plan elements. The reduction of road sizes as outlined in Exhibit A will be documented through photographs and field measurements to reflect the post-construction dimensions of the Spur Farm Road, Loop Farm Road, and Burn Pile Farm Road.

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The only vegetation plantings associated with the Spur Farm Road, Loop Farm Road, and Burn Pile Farm Road modifications are hydroseeding, as required to complete proper erosion and sediment control. Areas that have been hydroseeded will be evaluated through a visual assessment with photographs at 1 month and 9 months post-construction to ensure proper coverage of the seed mix to reestablish pasture grass (hay) species within these areas.

3.3.9 Contingency Measures

Contingency measures are provided as potential solutions if performance standards are not being met for a given mitigation site. Contingency measures are most often used within the first 2 years of a mitigation site's lifetime, which is when most problems occur, barring Acts of God. Given the anticipated timeline of activities, we expect the road dimension reductions and bare ground stabilization to be achieved within 1 year following construction. If the performance standards referenced above are not being met, then the following contingency/adaptive management measures shall apply**.**

- **Road Dimensions.** If the resulting roadway does not reflect the reduce road dimensions as designed and outlined in **Exhibit A**, the road modification work will continue until the designed dimensions are achieved.
- **Hydroseed Coverage**. Should areas of hydroseeding not provide substantial coverage within 9 months, these areas will be reseeded with attention paid to the areas of less dense vegetation. Additional considerations will be examined if herbaceous species coverage continues to be poor within these areas.

CHAPTER 4. CATCH BASIN REMOVAL (DOUBLEWIDE PASTURE)

4.1 Agencies Involved

This mitigation element is being provided to the EPA.

4.2 Purpose and Area Where Activities Will Occur

The work on the catch basins removal will occur in the areas described on **Exhibit A**.

4.3 Description of How Work Will be Completed

The catch basins will be physically removed through the use of small equipment, as needed, backfilled with sand and topsoil, and seeded with a pasture grass blend.

4.3.1 Task Schedule

Assuming all permits have been issued, work on this portion of the project would begin in summer of 2017, when water levels are lowest within the wetland and the surface is dry.

4.3.2 List of Heavy Earthmoving Equipment to be Used

Small excavator or backhoe and dump truck. Heavy earthmoving equipment will access the Farm to conduct the Work from the Union Hill Road entrance.

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4.3.3 Name(s) and Contact Information for Person(s) and/or Contractor(s) that will Complete the Work

Robert Bailie, Cascade Utilities, 7600 185th Ave. NE., Redmond, WA 98052; (425) 861-8787.

4.3.4 Process for Removing Gravel and Fill and Vegetating Area

Four (4) catch basins east of Wetland C will be removed as outlined on **Exhibit A**. The contractor will excavate around the structure before cutting and capping the pvc pipe and removing the catch basin to sever this connection. The remaining hole will be back-filled with sand and topsoil to match the surface elevation of the adjacent areas. These catch basins are located within a pasture, and so these areas will be hydroseeded or planted with appropriate pasture grasses to restore this area consistent to the adjacent pasture.

4.3.5 List of Best Management Practices

Work will be completed in the late summer to lessen the likelihood of runoff from exposed soils during construction. The proposed project will implement BMPs during construction to minimize impacts to the on-site critical areas during the construction process. Stormwater and erosion control BMPs to be implemented for the proposed project may include, but are not limited to:

- Site runoff containment;
- Silt fences;
- Straw bale dams;
- Rock check dams;
- Erosion control mesh, netting, seeding, or other cover for exposed soils;
- Rocked road entries; and covered, seeded, or otherwise stabilized soil stockpiles.

4.3.6 Monitoring Plan

A minimum of 1 permanent photo station will be established at the catch basins identified for removal prior to the commencement of any work. Photos will be taken after the conclusion of construction to document that these catch basins have been permanently removed. Photos, including a photo location graphic, will be included as figures in the first report due to agencies to document that this Mitigation Plan element is complete.

The existing conditions of the construction areas will be thoroughly photo-documented. These permanent photo station locations will be used weekly to photo-document the progress of construction from initiation to completion. These photos will illustrate how work is proceeding in these areas and document the final conditions following the completion of construction work. Photo stations will be located outside of the work area, but will provide panoramic views of said areas and the work being accomplished. The photos showing the existing condition and the as-built condition will be used to confirm the successful completion of the required work.

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4.3.7 Performance Standards

No performance standards are proposed for this Mitigation Plan element. The removal of the catch basins as outlined in **Exhibit A** will be documented through photographs to reflect the post-construction condition.

4.3.8 Contingency Measures

Contingency measures are provided as potential solutions if performance standards are not being met for a given mitigation site. Contingency measures are most often used within the first 2 years of a mitigation site's lifetime, which is when most problems occur, barring Acts of God. Given the anticipated timeline of activities, we expect the catch basin removal and bare ground stabilization to be achieved within 1 year following construction. If the performance standards referenced above are not being met, then the following contingency/adaptive management measures shall apply**.**

- **Catch Basin Removal.** If the post-development photographs do not reflect the removal of the noted catch basins as outlined in **Exhibit A**, the catch basin removal will continue until this Mitigation Plan element is complete.
- **Hydroseed Coverage**. Should areas of hydroseeding not provide substantial coverage within 9 months, these areas will be reseeded with attention paid to the areas of less dense vegetation. Additional considerations will be examined if herbaceous species coverage continues to be poor within these areas.

CHAPTER 5. CULVERT REPLACEMENT - FARM DITCH D1

5.1 Agencies Involved

This mitigation element is being provided to the EPA. Notification to the Corps and WDFW will be provided for this mitigation task as work adjacent to a fish-bearing stream is proposed.

5.2 Purpose and Area Where Activities Will Occur

The work will occur in and around Farm Ditch D1 as described on **Exhibit A**.

5.3 Description of How Work Will be Completed

The existing culvert will be removed and a small bridge will be placed instead, providing a more fish-friendly crossing, as shown on **Exhibit A**. Prior to construction, the Contractor will install orange fabric fences around work areas to prevent sediment from entering the adjacent ditches or wetlands. The ditch will be dammed at either end of the required stream segment to exclude fish from within the work area. Fish from within the work segment of this ditch will be removed with the use of a seine net and/or electroshocking to safely remove and relocate fish prior to construction disturbance.

5.3.1 Task Schedule

Assuming all permits have been issued, work on this portion of the project would begin in summer of 2017, when water levels within the ditch are lowest. This task will most likely be required to adhere to the fish window for Evans Creek, or as determined by WDFW.

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5.3.2 List of Heavy Earthmoving Equipment to be Used

Excavator, dump truck, and mini-excavator. Heavy earthmoving equipment will access the Farm to conduct the Work from the Union Hill Road entrance.

5.3.3 Name(s) and Contact Information for Person(s) and/or Contractor(s) that will Complete the Work

Robert Bailie, Cascade Utilities, 7600 185th Ave. NE., Redmond, WA 98052; (425) 861-8787.

5.3.4 Process for Removing Gravel and Fill and Vegetating Area

The existing culvert will be exposed and removed. The new abutments and crossing will be placed and the adjacent areas graded so that the crossing matches the adjacent ground elevations, as outlined on **Exhibit A**. Hydroseeding of exposed soil will occur after completion of construction. All debris will be removed and disposed of at a suitable location.

5.3.5 List of Best Management Practices

Work will be completed in the late summer to lessen the likelihood of runoff from exposed soils during construction. Prior to construction, the Contractor will install orange fabric fencing to define the limits of construction and to prevent mobilized soil, sediment, and other pollutants from entering the Farm Ditches or adjacent wetlands. Any disturbed soils will be hydroseeded post-construction.

The proposed project will implement BMPs during construction to minimize impacts to the on-site critical areas during the construction process. Stormwater and erosion control BMPs to be implemented for the proposed project may include, but are not limited to:

- Site runoff containment;
- Silt fences;
- Straw bale dams;
- Rock check dams;
- Erosion control mesh, netting, seeding, or other cover for exposed soils;
- Rocked road entries; and covered, seeded, or otherwise stabilized soil stockpiles.

5.3.6 Monitoring Plan

A minimum of 1 permanent photo station will be established at the crossing location prior to the commencement of any work. Photos will be taken during and after the conclusion of construction to document the construction process. Photos, including a photo location graphic, will be included as figures in the first report due to agencies to document that this mitigation task is complete.

The existing conditions of the construction areas will be thoroughly photo-documented. These permanent photo station locations will be used regularly to photo-document the progress of construction from initiation to completion. These photos will illustrate how work is proceeding in these areas and document the final conditions following the

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completion of construction work. Photo stations will be located outside of the work area, but will provide panoramic views of said areas and the work being accomplished. The photos showing the existing condition and the as-built condition will be used to confirm the successful completion of the required work.

5.3.7 Performance Standards

No performance standards are proposed for this Mitigation Plan element. The replacement of the culvert as outlined in **Exhibit A** will be documented through photographs to reflect the post-construction condition.

5.3.8 Contingency Measures

Contingency measures are provided as potential solutions if performance standards are not being met for a given mitigation site. Contingency measures are most often used within the first 2 years of a mitigation site's lifetime, which is when most problems occur, barring Acts of God. Given the anticipated timeline of activities, we expect the culvert removal and bridge replacement to be achieved immediately following construction. Bare ground stabilization will be achieved within 1 year following construction activities. If the performance standards referenced above are not being met, then the following contingency/adaptive management measures shall apply**.**

- **Culvert Removal.** If the post-development photographs do not reflect the removal and replacement of the noted culvert as outlined in **Exhibit A**, work will continue until this Mitigation Plan element is complete.
- **Hydroseed Coverage**. Should areas of hydroseeding not provide substantial coverage within 9 months, these areas will be reseeded with attention paid to the areas of less dense vegetation. Additional considerations will be examined if herbaceous species coverage continues to be poor within these areas.

CHAPTER 6. PLANTINGS - VEGETATION PLAN

6.1 Agencies Involved

This mitigation element is being provided to EPA and DOE. No additional permits are anticipated for these mitigation elements, as the only work proposed within wetlands is the planting of native trees and shrubs. These elements will be outlined to agencies during the application process for any required permits, but no separate permits will be sought in relation to these plantings.

6.2 Purpose and Area Where Activities Will Occur

Plantings of native vegetation will be added at multiple locations around the Property. These plantings will occur along Farm Ditch D1, Farm Ditch D2, Evans Creek, and within Wetlands B, Wetland C, and E as reflected on **Exhibit B**. Plantings adjacent to Evans Creek and the ditches are anticipated to create shading for anadromous fish habitat where shading vegetation is currently lacking. Coniferous trees will be used to the maximum extent practicable. Wet-adapted species will be used throughout the riparian habitat areas. Where a canopy exists, understory shrubs will be added to provide additional species diversity and habitat complexity. Access corridors along the

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ditches will be maintained between the proposed plantings to ensure continued access for farm maintenance.

6.3 Description of How Work Will be Completed

The plantings will be added as shown on **Exhibit B**.

6.3.1 Task Schedule

Assuming all permits have been issued, work on this portion of the project would begin in fall of 2017, when water levels in the adjacent ditches and wetlands are low and with expectation of rains beginning later in the year.

6.3.2 List of Heavy Earthmoving Equipment to be Used

Auger, mower and rototiller on a tractor, and a Truck. **Heavy earthmoving equipment will access the Farm to conduct the Work from the Union Hill Road entrance.**

6.3.3 Name(s) and Contact Information for Person(s) and/or Contractor(s) that will Complete the Work

Gordon Wegner, G&F Landscape Services, 107 236th Street SE, Bothell, Washington 98021. (425) 487-0486.

6.3.4 List of Best Management Practices

All planting will occur during the fall to maximize plant survivability. All plants will be inspected prior to installation to ensure health and vigor. The project contractor will lay out the plants based on the approved planting plan. Talasaea will then inspect the proposed plant layouts and make adjustments of plant locations based on existing conditions to ensure that plants are not being installed in specific locations unsuitable for their long-term survival. Talasaea will also inspect all plant material after installation to ensure that they have been properly installed, per industry standards.

Prior to the installation of plants, the soil within the planting area will be properly prepared. Preparation will include the removal of rubble, trash, or other construction-related debris; loosening of compacted soil; removal of non-native, invasive plant species; improve soil drainage (if necessary); and amendments to soil (if necessary) to improve plant survival.

Plant pits will be created using an auger on a piece of equipment to keep the impact minimal. The planting pits created will not be deeper than the plant's root ball or container depth. Soil amendments will be placed in the planting pits, if needed. Planting pits will be backfilled with topsoil from the auger cast-off to a depth not to exceed the crown of the plant. Plastic tubing or similar material will be placed around the stems of woody plants to prevent damage from small mammals, such as voles. These tubes will be removed at the end of the five-year monitoring period, or when plants are sufficiently mature to withstand potential small mammal damage. Planted material adjacent to ditches or streams will be protected from beaver by installing temporary wire fencing (i.e., hogwire fencing or similar material) around planting areas. This fencing will be removed at the end of the five-year monitoring period. Mulch rings will be established around planted material located outside of wetlands for a diameter of at least 2 feet and a depth of at least 3 inches.

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All planted material will require irrigation during the first year in the ground. Irrigation may be required during subsequent years until planted material has become well established. Watering will occur during the first year at regular intervals through the summer months or during periods of prolonged drought. Irrigation will provide approximately 1 inch of water per week between June 15 and October 15, or more frequently if necessary. Irrigation amounts and frequency may be reduced if approved by Talasaea Consultants.

6.4 Monitoring Plan

The following monitoring will be conducted for a period of five (5) years from the date of entry of the AOC, as outlined in **Table 2** above (copied below for ease of reference). Tree and shrub survivability will be monitored once per year during the growing season, preferably during the late spring, by directly assessing plant health (survivability) for the trees and shrubs planted as part of this Work Plan. Data collected during the fall monitoring event will be used in that year's Anniversary report to the EPA and other jurisdictional agencies. These data will be compared with baseline data and data collected from previous years monitoring events to illustrate the Property's progress towards success. All comparisons and conclusions will be based on the project's stated performance standards.

Table 3. Projected Schedule for Performance Monitoring and Maintenance Events

Year	Date	Maintenance Review	Performance Monitoring	Report Due to Agencies
Completion Report (includes As-built drawings and baseline assessment data)	Within 14 days of completing activity			X
Year 1 (includes As-built drawings and baseline assessment data)	Fall	X	X	X
Year 2	Spring	X	X	
	Fall	X	X	X
Year 3	Spring	X	X	
	Fall	X	X	
Year 4	Spring	X		
	Fall	X	X	X
Year 5	Spring	X		
	Fall	X	X	X

6.4.1 Performance Monitoring Guidelines

Performance monitoring will be conducted according to all applicable code or regulatory requirements and permit conditions. Monitoring will occur for a minimum of five (5) years according to the schedule presented in **Table 2** above. A qualified biologist or ecologist will perform all monitoring.

At the conclusion of construction, a minimum of 4 permanent photo stations will be established around the planting areas to show the progress of the mitigation throughout

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the years of monitoring. Photos will be taken of the mitigation planting areas and included in the as-built report to be sent to EPA and other jurisdictional agencies. Photos will be taken in subsequent years at these permanent photo stations to be included in each Anniversary report along with a graphic showing photo station locations.

Performance monitoring will be conducted through evaluation of permanent sampling transects. The number and location of permanent sampling transects will be determined at the time of the baseline assessment for the as-built report. The starting points of these transects will be identified in the field using ½ inch rebar topped with plastic caps. Each transect will be a minimum of 50 feet long. The orientation of each transect will be recorded in the as-built report and will be reused for each monitoring event (i.e., each transect will be the same length and at the same orientation for each monitoring event as established in the as-built report). Percent aerial coverage will be determined using the point-intercept methodology along the transect line. Percent survival of planted material will be determined by direct inventory of planted material at a minimum of two feet on either side of the transect line (once a width is established for a particular transect line, that width will be used for all subsequent monitoring events for the transect). Baseline data collected during the as-built inspection will be used to show the progress of the mitigation plan towards the successful completion of stated mitigation goals.

Data collected during the fall monitoring event will be used in that year's Anniversary report to the EPA and other jurisdictional agencies. These data will be compared with baseline data and data collected from previous years monitoring events to illustrate the Property's progress towards successful mitigation. All comparisons and conclusions will be based on the project's stated mitigation goals.

6.4.2 Maintenance Reviews

Maintenance reviews will be conducted in conjunction with performance monitoring. The purpose of this review is to identify areas of the mitigation planting areas that may be damaged (herbivory, flooding, plant dieback, trash, or evidence of vandalism) so that appropriate corrective actions may be taken. If significant issues affecting the success of the mitigation are detected, Talasaea will work with the Client and jurisdictional agencies to prepare remedial action (see Contingency Measures Section 4.4.5). Following maintenance reviews by the biologist or ecologist, required maintenance on the site will be implemented within 30 business days of submission of a maintenance memo to the maintenance contractor and permittee. A summary of maintenance items completed will be provided in the annual report.

The following list includes examples of maintenance actions that may be implemented during the course of the monitoring period. This list is not intended to be exhaustive, and other maintenance actions may be implemented as deemed necessary.

- During year one, replace all dead woody plant material.
- Remove/control weedy or exotic invasive plants (e.g., Himalayan blackberry, purple loosestrife, Japanese knotweed, etc.) by manual or chemical means approved by permitting agencies. Use of herbicides or pesticides within the

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mitigation area would only be implemented if other measures failed or were considered unlikely to be successful, and would only be applied by a certified applicator.
- All non-native vegetation must be removed and composted on-site or removed off-site.
- Weed all trees and shrubs to the dripline and provide 3-inch deep mulch rings 24 inches in diameter for shrubs and 36 inches in diameter for trees. Mulch would only be added within non-flood prone areas.
- Remove trash and other debris from the mitigation areas twice a year.
- Selectively prune woody plants at the direction of Talasaea Consultants to meet the mitigation plan's goal and objectives (e.g., thinning and removal of dead or diseased portions of trees/shrubs).

6.4.3 Temporary Irrigation System
A temporary irrigation system may be installed where necessary, as determined appropriate.

6.4.4 Performance Standards
The following performance standards for species shall apply:

- **Species diversity.** At least five (5) trees (three conifer and two small deciduous species) and nine (9) shrubs will be present during the monitoring period.
- **Plant survival.** At least 70% of this vegetation shall survive at the conclusion of the second vegetation monitoring event.
- **Plant survival**. Survival will be measured to assess the health of the mitigation area and will also be used to monitor species diversity. Plant survival will be no less than 70 percent on any subsequent year of monitoring.
- **Aerial plant coverage**. Plant cover is one way to measure the success of a newly planted area through natural regeneration and repopulation of a planted area. Aerial cover will be calculated at each permanent sampling transect via the point-intercept method and averaged across all transects to understand general site conditions. Total aerial coverage by woody plants will be 10% by the end of Year 1, 20% by the end of Year 2, 30% by the end of Year 3, and 50% by the end of Year 5.

6.4.5 Contingency Measures
Contingency measures are provided as potential solutions if performance standards are not being met for a given mitigation site. Contingency measures are most often used within the first 2 years of the mitigation site's lifetime, which is when most problems occur, barring Acts of God. Established performance standards for the project will be compared to the yearly monitoring results to judge the success of the mitigation. Potential or actual problems that might trigger the use of contingency measures would be readily apparent through this regular comparison of current data to previous years' data, as well as to the outlined performance standards.

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If, during the course of the monitoring period, there appears to be a significant problem with achieving the performance standards, the permittee shall work with the appropriate Agency staff to develop a Contingency Plan in order to get the project back into compliance with the performance standards. Contingency plans can include, but are not limited to, the following actions: additional plant installation, erosion control, modifications to hydrology, minor grading, soil amendments, irrigation, and plant substitutions of species, size, quantity, and/or location. Any required contingency plan shall be prepared and submitted according to the requirements of the EPA, as appropriate.

Should something occur that prevents the Site from meeting performance standards at the Year 5 monitoring event and dictates the use of contingency measures late in the performance monitoring timeframe, the 5-year monitoring report will clearly outline the proposed corrective actions and a timeline to anticipate success of those corrective actions. A determination about additional monitoring timeframes should be discussed at that point since many corrective actions take time to see results, particularly in light of the performance standards for vegetation plantings.

If the performance standards referenced above are not met, then the following contingency/adaptive management plan shall apply:

- **Consultation**. Talasaea will work with the Project Engineer, the Client, and the EPA (as well as other jurisdictional agencies) to determine the cause of plant failure. Corrective actions will be developed to address the plant failures upon approval by the EPA.
- **Evaluation of Non-attainment of Performance Standards**. Non-attainment of performance standards concerning planted material may be caused by poor soil conditions or drainage, diseased stock, flooding, or herbivory. Poor soil conditions may be rectified through drainage improvements or soil amendments. Other potential solutions include planting different species that may be better adapted for a specific site condition (such as dry conditions or flood tolerance), or providing additional protection against herbivory.
- **Active management and removal of invasive species**. Invasive species, such as reed canarygrass or Himalayan blackberry, can prevent the establishment of desirable native plant species.
- **Plant replacement.** Dead or dying plants will be removed and replanted. Substitution of plant species may be required if localized conditions are not favorable for the initial species planted. Additional protection from herbivory will be provided, if needed.

CHAPTER 7. PROPOSED SCHEDULE

The restoration and mitigation work will be generally sequenced as follows:

- Apply for and diligently pursue the legally required permits. Application for legally required permits will be submitted to the appropriate regulatory agencies no later

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than 90 days after the approval of this Work Plan by EPA and issuance of the King County grading permit.

- Survey and mark, as appropriate, areas for Farm Ditch D1 meander, farm road modification work, and tree and shrub planting.
- Farm Ditch D1 meander work will begin during summer 2017 when the ditch is either dry, or at its lowest level, and following permit approvals.
- Following permit approvals, road modification work will be conducted after the meander work to utilize ditch spoils from the meander work.
- Hydroseeding and/or use of straw to cover appropriate areas will occur upon completion of the construction activities to stabilize exposed soil as quickly as possible.
- Plantings of native trees and shrubs will occur according to the Vegetation Plan. Tree and shrub plantings will be completed during the first fall planting season (preferably mid September or early October) following completion of both the farm ditch meander work and farm road modification work.

CHAPTER 8. NOTIFICATIONS AND REPORTS

8.1 Notifications to EPA

At least seven (7) days prior to commencing activities on the Property under the EPA-Approved Final Restoration and Mitigation Work Plan, Respondents will notify the following EPA representative of Respondent's intent to commence the work: Krista Rave-Perkins, Water and Wetlands Enforcement Unit, U.S. Environmental Protection Agency, Region 10, 1200 Sixth Avenue, Mail Stop – OCE-101, Seattle, Washington 98101, Phone: (206) 553-6686

8.2 Completion Report

Within 14 days of completing the on-site mitigation activities described herein, Respondents will notify the EPA representative specified in paragraph 5.6 of the AOC and the DOE representative specified in the DOE Order through the preparation of a Completion (as-built) report documenting the activities completed. The notification will include photographs of Property conditions before and after compliance with the AOC. EPA will approve the Completion Report within a reasonable time, not to exceed thirty (30) days from receipt of Respondent's written notification.

8.3 Annual Reports

Four (4) Annual Reports will be submitted to EPA as specified in paragraph 5.7 of the AOC and as specified in the "Progress Report" section of the DOE Order, which will include: Documentation of the changes of the Farm Ditch D1 meander (channel stability and erosion); photographic documentation of the fill removal at the Spur Farm Road, Loop Farm Road, and Burn Pile Farm Road; and documentation of the seeding/vegetation efforts described in the EPA Final Restoration and Mitigation Work Plan. The Reports shall be submitted on the following schedule:

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Annual Report #1: On or before 1st anniversary of EPA's AOC Report
Annual Report #2: On or before 2nd anniversary of EPA's AOC Report
Annual Report #3: On or before 4th anniversary of EPA's AOC Report
Annual Report #4: On or before 5th anniversary of EPA's AOC Report

Reports shall be submitted to the following EPA and DOE representatives:

EPA:
Krista Rave-Perkins
Water and Wetlands Enforcement Unit
U.S. EPA
1200 Sixth Avenue, Mail Stop – OCE-101
Seattle, WA 98101
Phone: (206) 553-6686

DOE:
Doug Gresham
Department of Ecology
Northwest Regional Office
3190 160th Ave., SE
Bellevue, WA 98008
Phone: (425) 649-7148

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EXHIBIT A

Gunshy Manor Farm Work Plan

(As Prepared by ESM)

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CONSTRUCTION PLANS

for

GUNSHY MANOR FARM

EXHIBIT "A" SITE SURVEY, SKETCH, AND/OR DRAWING DEPICTING SITE'S FEATURES AND BOUNDARIES

prepared for

THE ESTATE OF BARBARA J. NELSON AND THE WCN
GST NONEXEMPT MARITAL TRUST #2

C/O WILLIAM C. NELSON, JR.
16508 NE 79TH STREET
REDMOND, WA 98072

NOTE:
CONTRACTOR MUST OBTAIN A COPY OF THIS CONSENT ORDER TO PERFORM ANY OF THE WORK SHOWN ON THIS PLAN SET AT LEAST 48 HOURS PRIOR TO THE INITIATION OF SUCH WORK,

OWNER
THE ESTATE OF BARBARA J. NELSON AND THE WCN
GST NONEXEMPT MARITAL TRUST #2
C/O WILLIAM C. NELSON, JR.
16508 NE 79TH STREET
REDMOND, WA 98072

WETLAND CONSULTANT
TALASAEA CONSULTANTS
10520 BEAR CREEK RD. NE
WOODINVILLE, WA 98072
PHONE: 425-861-7550
CONTACT: BILL SHIELS

SITE DATA
KING COUNTY ASSESSORS PARCEL NUMBERS: 082506-9012
-9103
-9104
-9105

ADDRESS: 7412 196TH AVE NE
REDMOND WA, 98053

COMPREHENSIVE PLAN DESIGNATION: RURAL

ZONING: RA-5

LAND USE: RESIDENTIAL/FARMING

ADMINISTRATIVE ORDER ON CONSENT
DOCKET NO. CWA-10-2016-0087
EFFECTIVE JUNE 7, 2016

HORIZONTAL DATUM
PLAT OF "GUN-SHY RIDGE" AS RECORDED IN VOLUME 148 OF PLATS, PAGES 77 THROUGH 89, UNDER RECORDING NO. 8910181051.

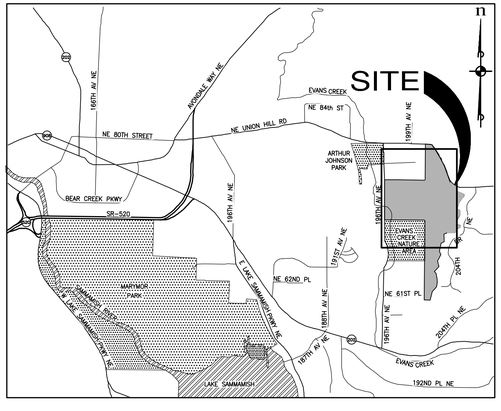
BASIS OF BEARING
N 00°14'24" E PER THE PLAT OF "GUN-SHY RIDGE" AS MEASURED BETWEEN THE FOUND SOUTHWEST CORNER OF SECTION AND THE FOUND WEST QUARTER CORNER OF SECTION AS DEPICTED HEREON.

BASIS OF VERTICAL DATUM:
NAVD88

BENCH MARK COR 9157, 2" DIAMETER BRASS DISK STAMPED "CITY OF REDMOND 9157, 2009"
LOCATION: SET IN CENTER OF A 5 FOOT WIDE CONCRETE STRIP AT THE NORTH END OF "HISTORIC BRICK ROAD", +/- 27' SOUTH OF THE INTERSECTION OF NE UNION HILL RD. AND 196TH AVENUE NE
ELEVATION = 68.32

TEMPORARY BENCHMARKS:
TBM#1000-REBAR AND CONTROL CAP, EL.64.62'
TBM#2002-PK NAIL AND WASHER, EL.68.32'

Vicinity Map



prepared by

ESM

33400 8th Ave S, Suite 205
FEDERAL WAY, WASHINGTON 98003
Phone: (253) 838-6113

LAURA G. BARTENHAGEN
STATE OF WASHINGTON
40111
REGISTERED PROFESSIONAL ENGINEER

Sheet Index

SHEET NO.	DRAWING NO.	DESCRIPTION
1	EPA-01	EXHIBIT "A" SITE SURVEY, SKETCH, AND/OR DRAWING DEPICTING SITE'S FEATURES AND BOUNDARIES - COVER SHEET
2	EPA-02	EXHIBIT "A" SITE SURVEY, SKETCH, AND/OR DRAWING DEPICTING SITE'S FEATURES AND BOUNDARIES - SITE SURVEY
3	EPA-03	EXHIBIT "A" SITE SURVEY, SKETCH, AND/OR DRAWING DEPICTING SITE'S FEATURES AND BOUNDARIES - WORK PLAN
4	EPA-04	EXHIBIT "A" SITE SURVEY, SKETCH, AND/OR DRAWING DEPICTING SITE'S FEATURES AND BOUNDARIES - WORK PLAN
5	EPA-05	EXHIBIT "A" SITE SURVEY, SKETCH, AND/OR DRAWING DEPICTING SITE'S FEATURES AND BOUNDARIES - WORK PLAN
6	EPA-06	EXHIBIT "A" SITE SURVEY, SKETCH, AND/OR DRAWING DEPICTING SITE'S FEATURES AND BOUNDARIES - WORK PLAN
7	EPA-07	EXHIBIT "A" SITE SURVEY, SKETCH, AND/OR DRAWING DEPICTING SITE'S FEATURES AND BOUNDARIES - T.E.S.C. NOTES & DETAILS

ESM JOB NO. 1359-001-007

KING COUNTY DDES APPROVAL	
Review Engineer	Date
Senior Engineer	Date
Scott Smith, P.E. DEVELOPMENT ENGINEER	Date

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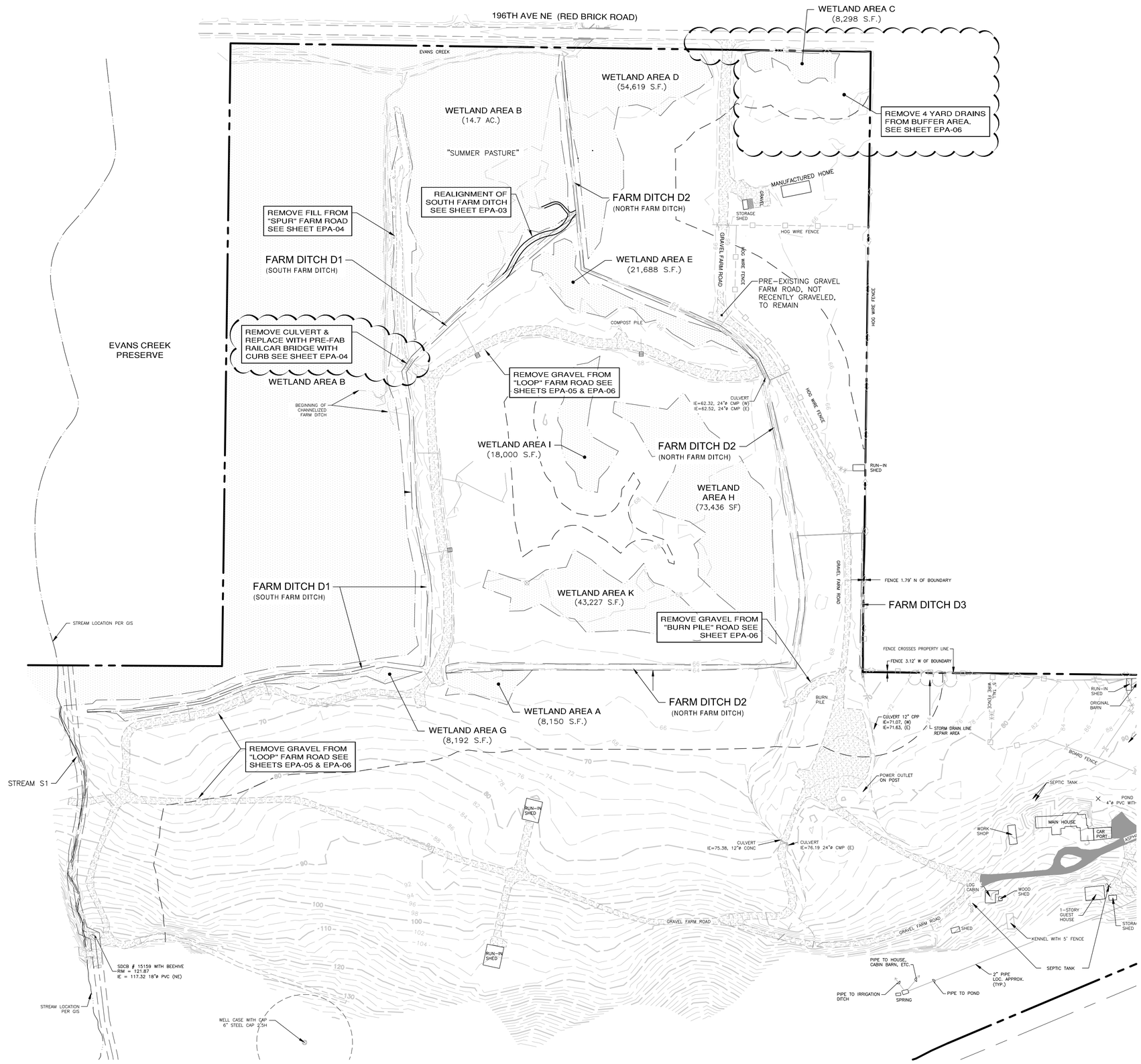
Plotted By: Don Lapp



n

SCALE: 1" = 100'

100 50 0 100 200

CONTOUR INTERVAL = 2'

LEGEND (EXISTING)

- STORM DRAIN CATCH BASIN
- GUY ANCHOR
- POWER POLE
- GRAVEL FARM ROADS
- WETLANDS
- WETLAND BUFFERS
- HOG WIRE FENCE
- CULVERT
- TOPOGRAPHIC CONTOUR

KING COUNTY DDES APPROVAL	
Review Engineer	Date
Senior Engineer	Date
Scott Smith, P.E. DEVELOPMENT ENGINEER	Date

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4	PER EPA #CWA-10-2016-0085 05/01/2017	ESM

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THE ESTATE OF BARBARA J. NELSON

GUNSHY MANOR FARM

EXHIBIT "A" SITE SURVEY, SKETCH, AND/OR DRAWING DEPICTING SITE'S FEATURES AND BOUNDARIES
KING COUNTY WASHINGTON

SITE SURVEY

JOB NO.:	1359-001-012
DWG. NAME:	EPA-02
DESIGNED BY:	EGL
DRAWN BY:	CJR
CHECKED BY:	
DATE:	05/31/2017
DATE OF PRINT:	

EPA-02

2 OF 7 SHEETS

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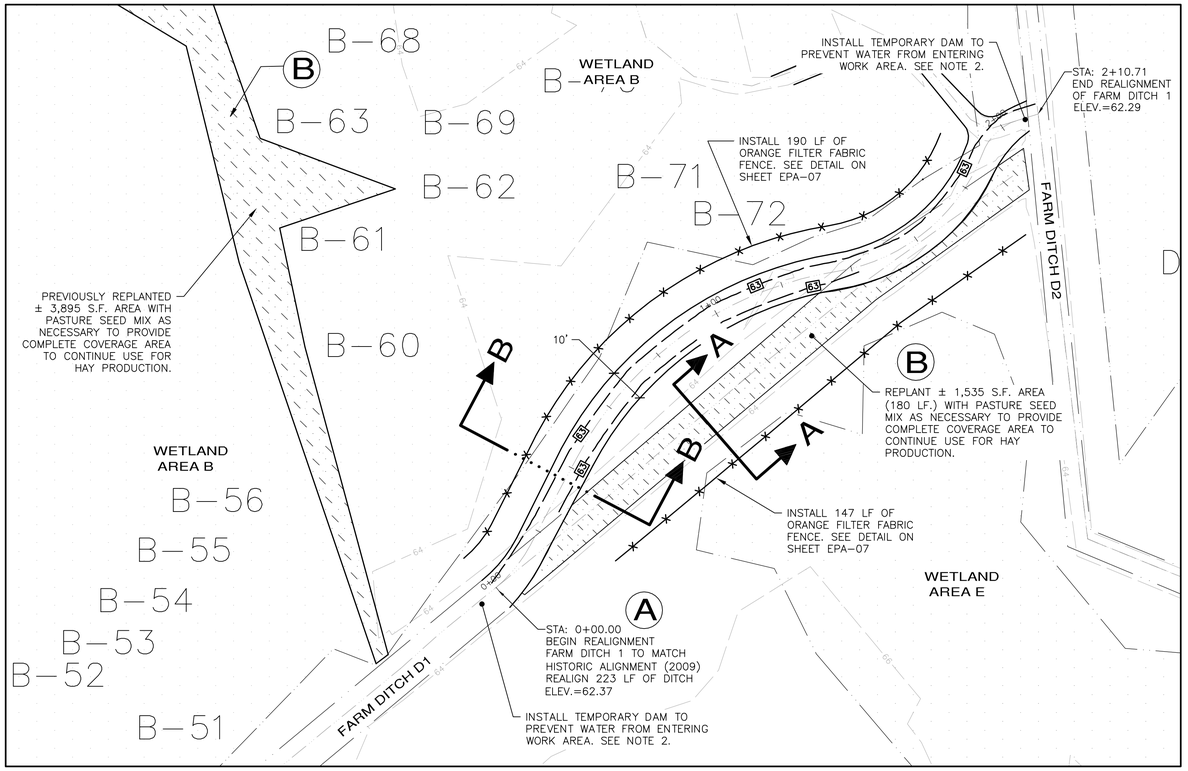
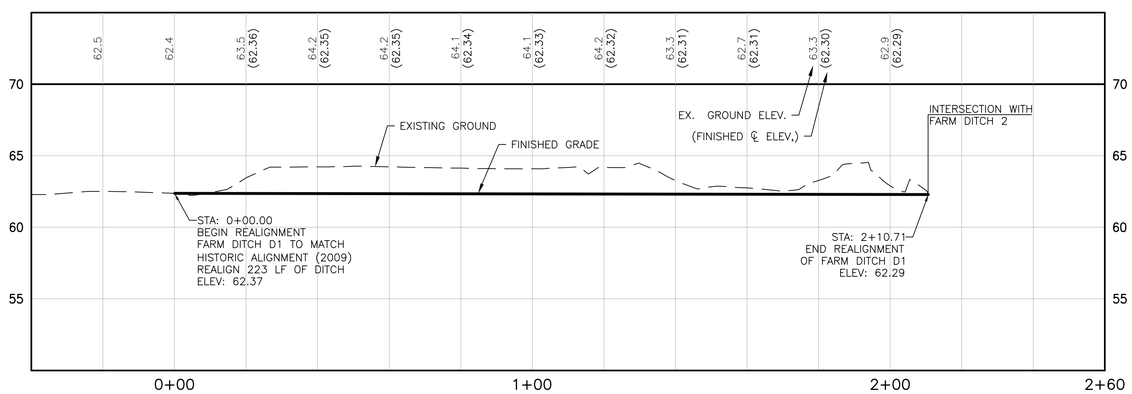


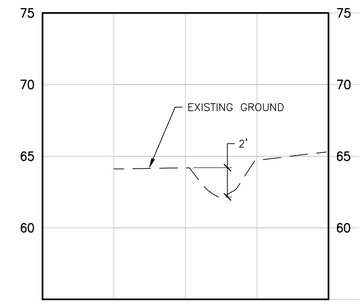
FARM DITCH 1 (SOUTH FARM DITCH)

SCALE: 1" = 20'



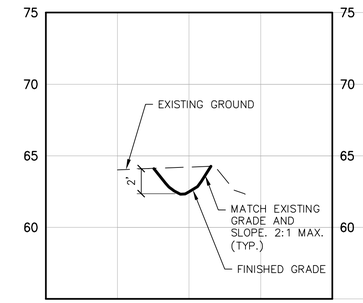
FARM DITCH 1 (SOUTH FARM DITCH)

SCALE: 1"=20' HORIZ.
1"=5' VERT.



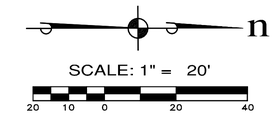
SECTION A-A

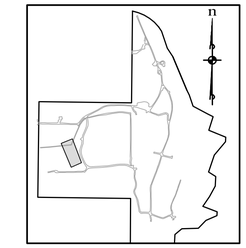
SCALE: 1"=20' HORIZ.
1"=5' VERT.



SECTION B-B

SCALE: 1"=20' HORIZ.
1"=5' VERT.





KEY MAP

FARM DITCH MEANDER PROPOSED GRADING VOLUMES

FARM DITCH 1 EXCAVATION	= 65.0 CY
FARM DITCH 1 FILL	= 32.3 CY
NET EXCAVATION	= 32.7 CY

(EXCESS MATERIAL TO BE USED TO REPLACE GRAVEL REMOVED ALONG LOOP FARM ROAD, IN AREAS LOCATED OUTSIDE OF DELINEATED WETLANDS.)

NOTES:

1. SEE SHEET EPA-07 FOR DETAILS & NOTES.
2. TEMPORARY DAMS TO BE CONSTRUCTED OF SAND BAGS, IMPERMEABLE GEOTEXTILE FABRIC AND HOG WIRE.

MITIGATION PROPOSED:

(A) REALIGN FARM DITCH D1 TO MATCH HISTORIC ALIGNMENT (2009). REPLANT DISTURBED AREAS WITH PASTURE SEED MIX FOR CONTINUED USE FOR HAY PRODUCTION.

(B) REPLANT DISTURBED AREA WITH PASTURE SEED MIX FOR CONTINUED USE FOR HAY PRODUCTION.

SYMBOL LEGEND

REPLANT WITH PASTURE SEED MIX AS NECESSARY TO PROVIDE COMPLETE COVERAGE. REFER TO SEED CHART THIS SHEET.

PASTURE AND HAYLAND RENOVATION

A. CONTROL PROBLEM PERENNIAL WEEDS.
B. PRIOR TO SEEDING, APPLY LIME AND FERTILIZER AT RATES IN ACCORDANCE WITH CURRENT SOIL TESTING.
E. PLANT TO DESIRED PASTURE SPECIES IN EARLY FALL.

SEED CHART

FORAGE SPECIES ADAPTATION BY USE AND SOIL TYPE

SOIL TYPE	USE: GRAZING ONLY OR GRAZING & HAY	USE: EXCLUSIVELY FOR HAY
SOMEWHAT POORLY DRAINED IN WINTER AND EARLY SPRING. RECOMMENDED SEEDING SEASON: SPRING OR FALL	TALL FESCUE ANNUAL RYEGRASS PERENNIAL RYEGRASS BIG TREFOIL BIRDSFOOT TREFOIL	TALL FESCUE TIMOTHY BIG TREFOIL BIRDSFOOT TREFOIL
MIXED DRAINAGE: DRY UPLANDS AND WET SWALES RECOMMENDED SEEDING SEASON: FALL.	TALL FESCUE ANNUAL RYEGRASS PERENNIAL RYEGRASS BIG TREFOIL BIRDSFOOT TREFOIL MEADOW FOXTAIL	TALL FESCUE ORCHARDGRASS[1] TIMOTHY BIG TREFOIL BIRDSFOOT TREFOIL MEADOW FOXTAIL[2]

1. USE ONLY IN A MIX WITH OTHER SPECIES.
2. SEEDING NOT RECOMMENDED. FOR MANAGEMENT AND REJUVENATION OF EXISTING STANDS, SEE SPECIES INFORMATION. (PASTURE AND HAYLAND RENOVATION FOR WESTERN WASHINGTON AND OREGON, WASHINGTON STATE UNIVERSITY EXTENSION)

Know what's **below.**
Call before you dig.

KING COUNTY DDES APPROVAL	
Review Engineer	Date
Senior Engineer	Date
Scott Smith, P.E. DEVELOPMENT ENGINEER	Date

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GUNSHY MANOR FARM

EXHIBIT "A" SITE SURVEY, SKETCH, AND/OR DRAWING DEPICTING SITE'S FEATURES AND BOUNDARIES
WORK PLAN
KING COUNTY WASHINGTON

JOB NO.:	1359-001-012
DWG. NAME:	EPA-03
DESIGNED BY:	EGL
DRAWN BY:	CJR
CHECKED BY:	
DATE:	05/31/2017
DATE OF PRINT:	

EPA-03

File: \\esmfs\wrp\ESM-JOBS\1359\001\007\plot\EPA-Final\EPA-03.dwg
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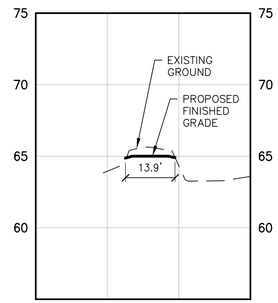
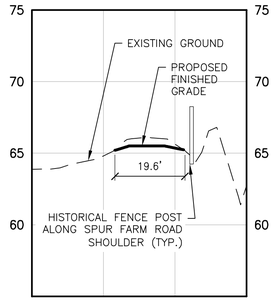
Plotted By: Don Lapp



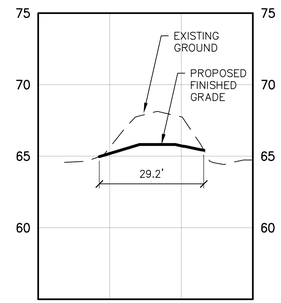
SECTION A-A

SCALE: 1"=20' HORIZ. 1"=5' VERT.



SECTION B-B

SCALE: 1"=20' HORIZ. 1"=5' VERT.



SECTION C-C

SCALE: 1"=20' HORIZ. 1"=5' VERT.

NOTES:

1. SEE SHEET EPA-07 FOR DETAILS AND NOTES.
2. MATERIAL TO BE USED TO REPLACE GRAVE REMOVED FROM LOOP FARM AND BURN PILE ROADS.

SPUR FARM ROAD PROPOSED GRADING VOLUMES

SPUR FARM ROAD EXCAVATION (SEE NOTE 2)	= 369 CY
NET EXCAVATION	= 369 CY

MITIGATION / RESTORATION SEQUENCE FOR WORK AREAS

(D)
1. REMOVE PORTIONS OF GRAVEL AND DIRT LAYER FROM PRE-EXISTING COBBLE ROAD SURFACE.
2. HYDROSEED DISTURBED AREAS.

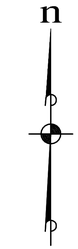
(E)
1. REMOVE PORTIONS OF GRAVEL AND DIRT LAYER FROM PRE-EXISTING DIRT FARM ROAD SURFACE.
2. HYDROSEED DISTURBED AREAS.

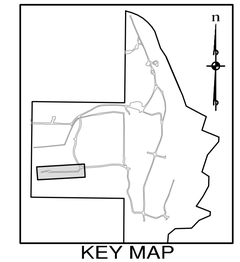
(G)
1. REMOVE SOIL TO EXPOSE 48"ø CULVERT.
2. REMOVE CULVERT.
3. PLACE ABUTMENTS OUTSIDE OF OHWM OF FARM DITCH D1.
4. PLACE PRE-FAB 9'x28' RAILCAR BRIDGE, DESIGNED BY OTHERS.

SCALE: 1" = 20'

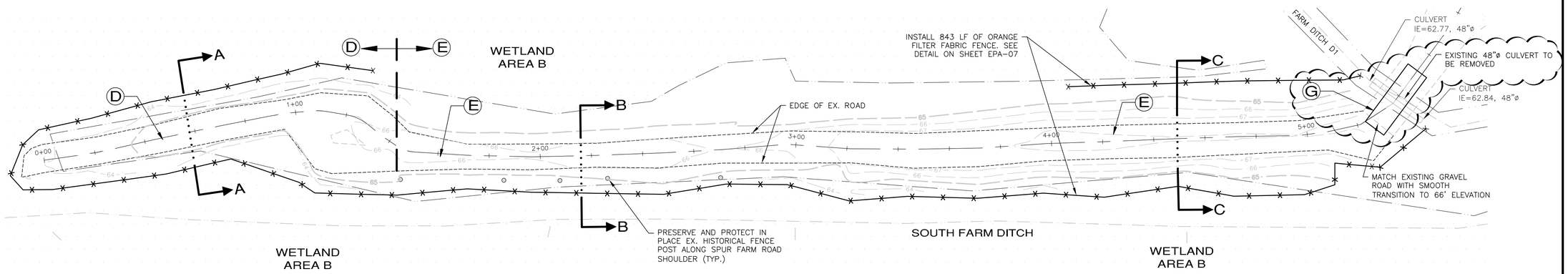
20 10 0 20 40

CONTOUR INTERVAL = 2'



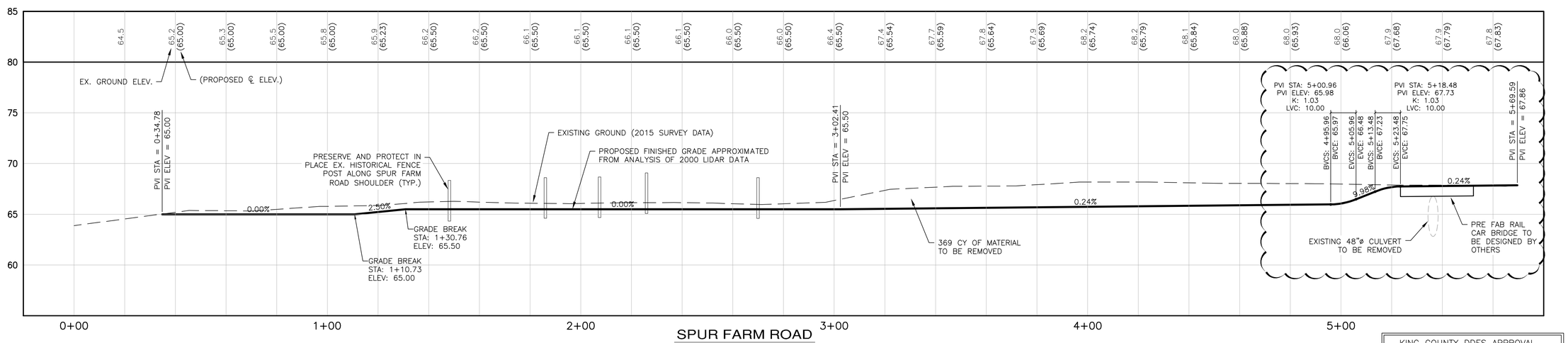


KEY MAP



SPUR FARM ROAD

SCALE: 1" = 20'



SPUR FARM ROAD

SCALE: 1"=20' HORIZ. 1"=5' VERT.

KING COUNTY DDES APPROVAL	
Review Engineer	Date
Senior Engineer	Date
Scott Smith, P.E. DEVELOPMENT ENGINEER	Date

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THE ESTATE OF BARBARA J. NELSON

GUNSHY MANOR FARM

EXHIBIT "A" SITE SURVEY, SKETCH, AND/OR DRAWING DEPICTING SITE'S FEATURES AND BOUNDARIES

KING COUNTY WASHINGTON

WORK PLAN

JOB NO.:	1359-001-012
DWG. NAME:	EPA-04
DESIGNED BY:	EGL
DRAWN BY:	CJR
CHECKED BY:	
DATE:	05/31/2017
DATE OF PRINT:	

EPA-04

4 OF 7 SHEETS

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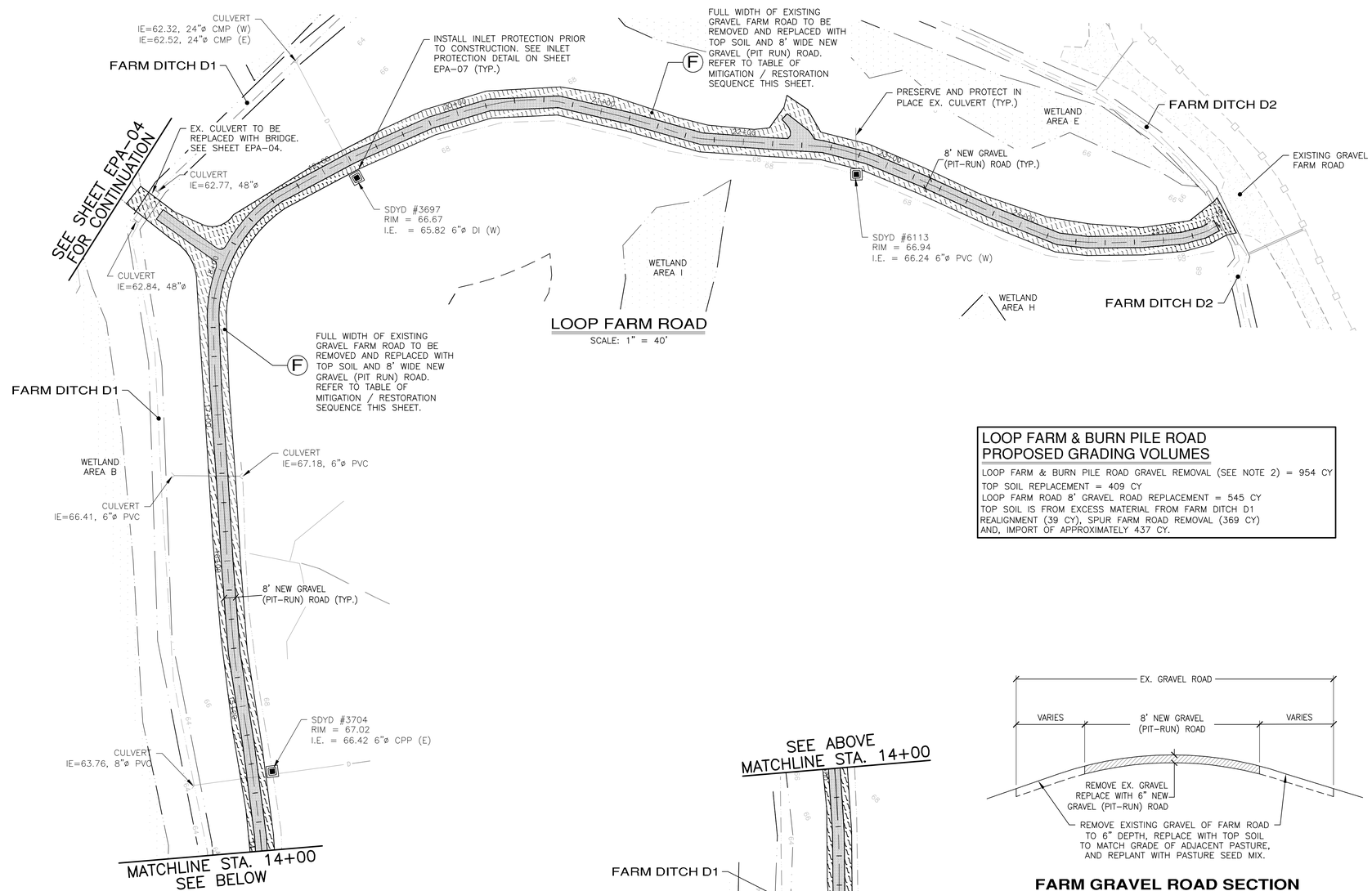
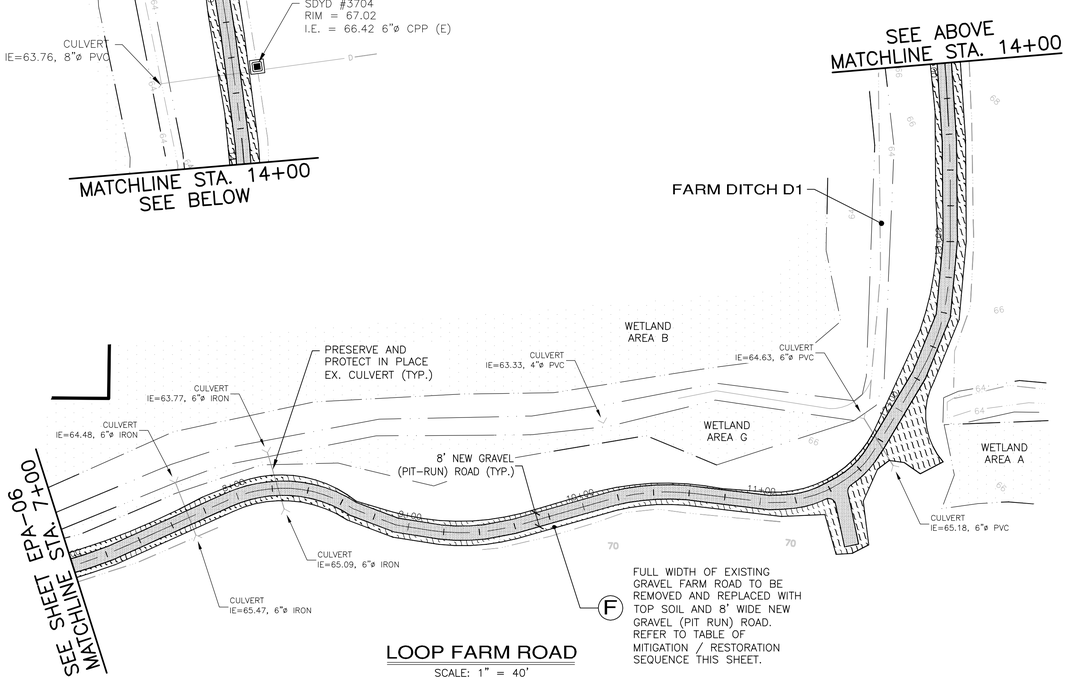


LOOP FARM ROAD

SCALE: 1" = 40'



LOOP FARM ROAD

SCALE: 1" = 40'

LOOP FARM & BURN PILE ROAD PROPOSED GRADING VOLUMES

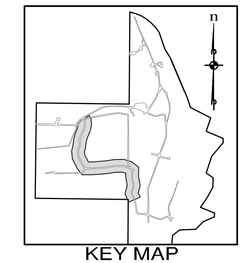
LOOP FARM & BURN PILE ROAD GRAVEL REMOVAL (SEE NOTE 2) = 954 CY
TOP SOIL REPLACEMENT = 409 CY
LOOP FARM ROAD 8' GRAVEL ROAD REPLACEMENT = 545 CY
TOP SOIL IS FROM EXCESS MATERIAL FROM FARM DITCH D1 REALIGNMENT (39 CY), SPUR FARM ROAD REMOVAL (369 CY) AND, IMPORT OF APPROXIMATELY 437 CY.

FARM GRAVEL ROAD SECTION

NOT TO SCALE

SCALE: 1" = 40'

CONTOUR INTERVAL = 2'



KEY MAP

NOTES:

1. SEE SHEET EPA-07 FOR DETAILS AND NOTES.
2. ±10 CY OF GRAVEL TO BE STOCKPILED ONSITE AND USED FOR FARM ROAD MAINTENANCE. SEE SHEET EPA-06. REMAINING 820 CY TO BE HAULED OFF SITE TO AN APPROVED RECEIVING SITE.

TABLE OF MITIGATION / RESTORATION SEQUENCE FOR WORK AREAS

(F) FULL WIDTH OF EXISTING GRAVEL FARM ROAD TO BE REMOVED AND REPLACED WITH TOP SOIL AND 8' WIDE NEW GRAVEL (PIT RUN) ROAD. EXACT LOCATION TO BE ESTABLISHED IN THE FIELD, WITHIN THE EXISTING PRISM TO MAINTAIN DRAINAGE PATTERNS.

SYMBOL LEGEND

SYMBOL	MITIGATION/RESTORATION SUMMARY
	GRAVEL ON EITHER SIDE OF 8' WIDE GRAVEL FARM ROAD TO BE REMOVED AND FILLED WITH TOP SOIL TO RESTORE PASTURE. REFER TO TABLE OF MITIGATION / RESTORATION SEQUENCE THIS SHEET.
▣	–STORM DRAIN YARD DRAIN– INSTALL FILTER FABRIC TO PREVENT SEDIMENT FROM ENTERING YARD DRAIN DURING CONSTRUCTION.

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KING COUNTY DDES APPROVAL	
Review Engineer	Date
Senior Engineer	Date
Scott Smith, P.E. DEVELOPMENT ENGINEER	Date

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KING COUNTY WASHINGTON

JOB NO.:	1359-001-012
DWG. NAME:	EPA-05
DESIGNED BY:	EGL
DRAWN BY:	CJR
CHECKED BY:	
DATE:	05/31/2017
DATE OF PRINT:	

EPA-05

5 OF 7 SHEETS

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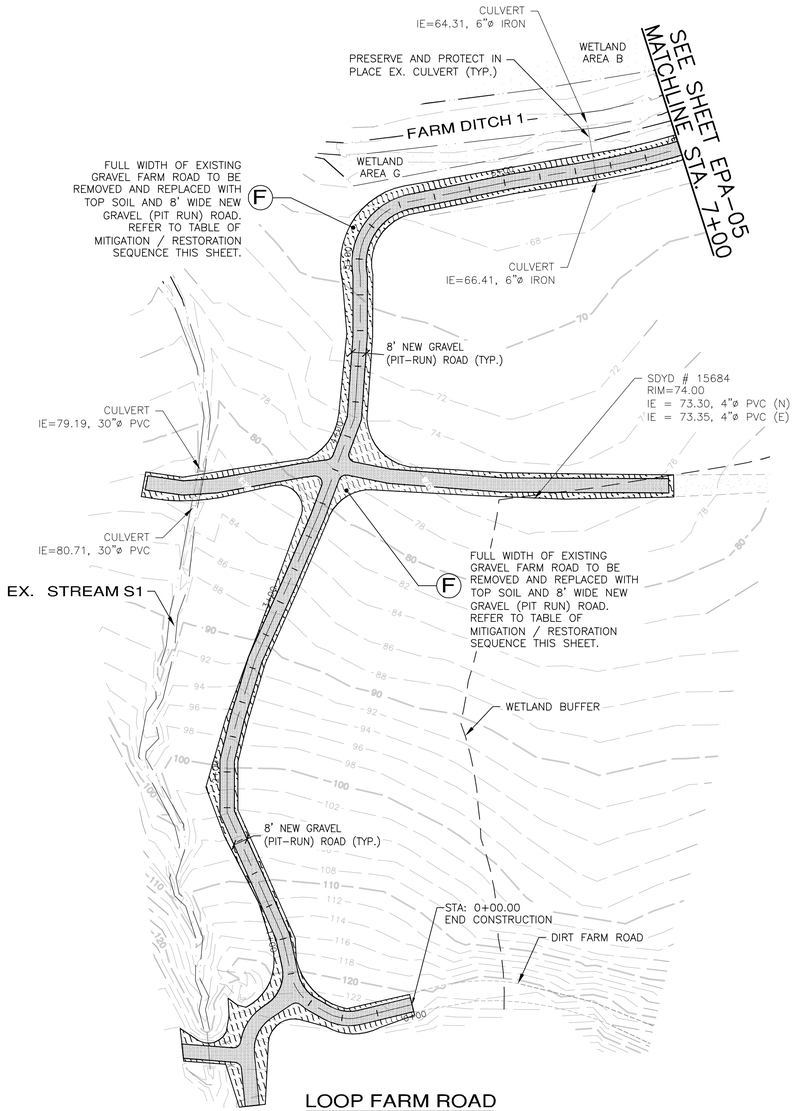
Plotted By: Don Lapp



LOOP FARM ROAD

SCALE: 1" = 40'

LOOP FARM & BURN PILE ROAD PROPOSED GRADING VOLUMES

LOOP FARM & BURN PILE ROAD GRAVEL REMOVAL (SEE NOTE 2) = 954 CY
TOP SOIL REPLACEMENT = 409 CY
LOOP FARM ROAD 8' GRAVEL ROAD REPLACEMENT = 545 CY
TOP SOIL IS FROM EXCESS MATERIAL FROM FARM DITCH D1 REALIGNMENT (39 CY), SPUR FARM ROAD REMOVAL (369 CY) AND, IMPORT OF APPROXIMATELY 437 CY.

NOTES:

1. SEE SHEET EPA-07 FOR DETAILS AND NOTES.
2. ±10 CY OF GRAVEL TO BE STOCKPILED ONSITE AND USED FOR FARM ROAD MAINTENANCE. SEE SHEET EPA-06. REMAINING 820 CY TO BE HAULED OFF SITE TO AN APPROVED RECEIVING SITE.

TABLE OF MITIGATION / RESTORATION SEQUENCE FOR WORK AREAS

F — FULL WIDTH OF EXISTING GRAVEL FARM ROAD TO BE REMOVED AND REPLACED WITH TOP SOIL AND 8' WIDE NEW GRAVEL (PIT RUN) ROAD. EXACT LOCATION TO BE ESTABLISHED IN THE FIELD, WITHIN THE EXISTING PRISM TO MAINTAIN DRAINAGE PATTERNS.

H — REMOVE THE 4 EXISTING YARD DRAINS EAST OF WETLAND C AND CAP AND PLUG THEIR EXISTING SD, FILL EACH HOLE WITH 1 YARD OF SAND & TOPSOIL THEN SEED.

SYMBOL LEGEND

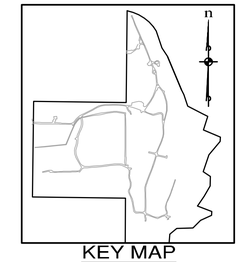
SYMBOL	MITIGATION/RESTORATION SUMMARY
	GRAVEL ON EITHER SIDE OF 8' WIDE GRAVEL FARM ROAD TO BE REMOVED AND FILLED WITH TOP SOIL TO RESTORE PASTURE. REFER TO TABLE OF MITIGATION / RESTORATION SEQUENCE THIS SHEET.

n

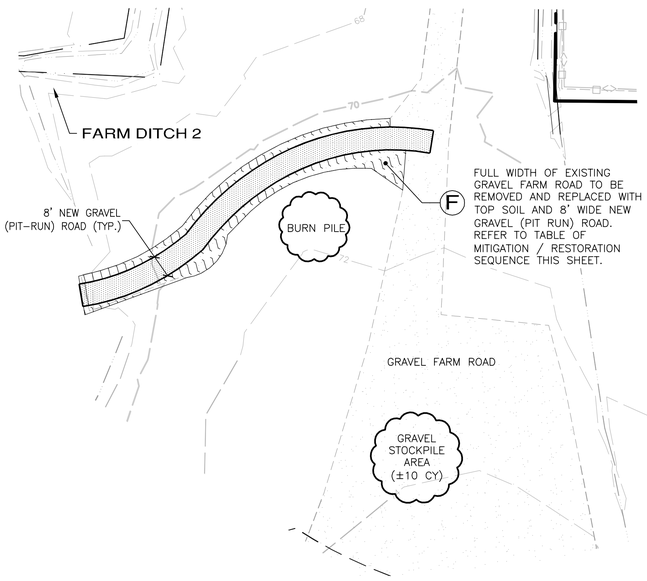
SCALE: 1" = 40'

40 20 0 40 80

CONTOUR INTERVAL = 2'

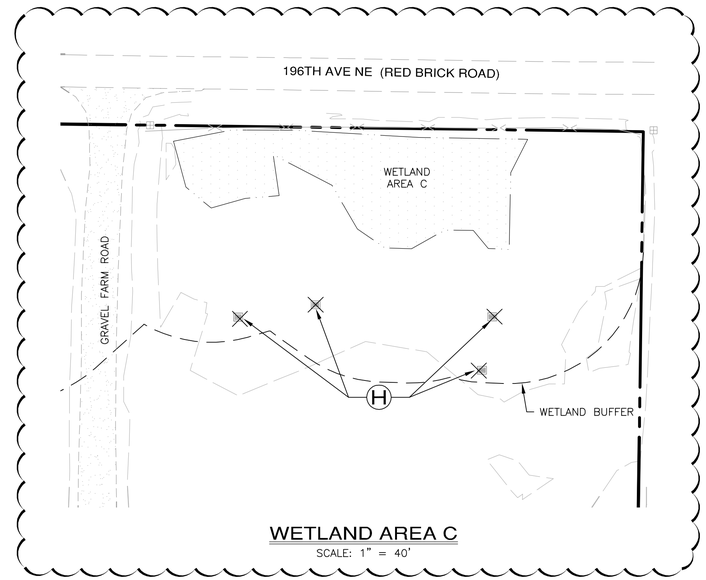


KEY MAP



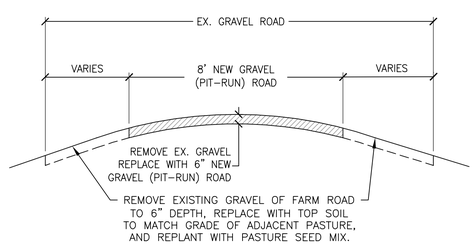
BURN PILE ROAD

SCALE: 1" = 40'



WETLAND AREA C

SCALE: 1" = 40'



FARM GRAVEL ROAD SECTION

NOT TO SCALE

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Senior Engineer	Date
Scott Smith, P.E. DEVELOPMENT ENGINEER	Date

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REVISIONS

NO.	DESCRIPTION/DATE	BY
0	REVISIONS PER EPA 11/30/2016	ESM
1	REVISIONS PER TALASEA 01/16/2017	ESM
2	REVISIONS PER KING COUNTY 02/17/2017	ESM
3	REVISIONS PER KING COUNTY 03/14/2017	ESM
4	PER EPA JCWA-10-2016-0085 05/01/2017	ESM

LAURA G. BARTENHAGEN, STATE OF WASHINGTON, 40111, REGISTERED PROFESSIONAL ENGINEER

ESM CONSULTING ENGINEERS LLC
33400 8th Ave S, Suite 205
Federal Way, WA 98003
FEDERAL WAY (253) 838-6113
EVERETT (425) 297-9900
www.esmcivil.com
Civil Engineering | Land Planning
Public Works | Land Surveying | Landscape Architecture
Project Management

THE ESTATE OF BARBARA J. NELSON

GUNSHY MANOR FARM

EXHIBIT "A" SITE SURVEY, SKETCH, AND/OR DRAWING DEPICTING SITE'S FEATURES AND BOUNDARIES

KING COUNTY WASHINGTON

WORK PLAN

JOB NO.:	1359-001-012
DWG. NAME:	EPA-06
DESIGNED BY:	EGL
DRAWN BY:	CJR
CHECKED BY:	
DATE:	05/31/2017
DATE OF PRINT:	

EPA-06

6 OF 7 SHEETS

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Plotted: 5/31/2017 2:54 PM
Plotted By: Don Lopp

EROSION/SEDIMENTATION CONTROL NOTES:

1. APPROVAL OF THIS EROSION AND SEDIMENTATION CONTROL (ESC) PLAN DOES NOT CONSTITUTE AN APPROVAL OF PERMANENT ROAD OR DRAINAGE DESIGN (E.G. SIZE AND LOCATION OF ROADS, PIPES, RESTRICTORS, CHANNELS, RETENTION FACILITIES, UTILITIES, ETC.)
2. THE IMPLEMENTATION OF THESE ESC PLANS AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THESE ESC FACILITIES IS THE RESPONSIBILITY OF THE APPLICANT/ESC SUPERVISOR UNTIL ALL CONSTRUCTION IS APPROVED.
3. THE BOUNDARIES OF THE CLEARING LIMITS SHOWN ON THIS PLAN SHALL BE CLEARLY FLAGGED BY SURVEY TAPE OR FENCING, IF REQUIRED, PRIOR TO CONSTRUCTION (SWDM APPENDIX D). DURING THE CONSTRUCTION PERIOD, NO DISTURBANCE BEYOND THE CLEARING LIMITS SHALL BE PERMITTED. THE CLEARING LIMITS SHALL BE MAINTAINED BY THE APPLICANT/ESC SUPERVISOR FOR THE DURATION OF CONSTRUCTION.
4. THE ESC FACILITIES SHOWN ON THIS PLAN MUST BE CONSTRUCTED PRIOR TO OR IN CONJUNCTION WITH ALL CLEARING AND GRADING SO AS TO ENSURE THAT THE TRANSPORT OF SEDIMENT TO SURFACE WATERS, DRAINAGE SYSTEMS, AND ADJACENT PROPERTIES IS MINIMIZED.
5. THE ESC FACILITIES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, THESE ESC FACILITIES SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS AND MODIFIED TO ACCOUNT FOR CHANGING SITE CONDITIONS (E.G. ADDITIONAL COVER MEASURES, ADDITIONAL SUMP PUMPS, RELOCATION OF DITCHES AND SILT FENCES, PERIMETER PROTECTION ETC.).
6. THE ESC FACILITIES SHALL BE INSPECTED DAILY BY THE APPLICANT/ESC SUPERVISOR AND MAINTAINED TO ENSURE CONTINUED PROPER FUNCTIONING. WRITTEN RECORDS SHALL BE KEPT OF WEEKLY REVIEWS OF THE ESC FACILITIES.
7. ANY AREAS OF EXPOSED SOILS, INCLUDING ROADWAY EMBANKMENTS, THAT WILL NOT BE DISTURBED FOR SEVEN DAYS DURING THE DRY SEASON SHALL BE IMMEDIATELY STABILIZED WITH THE APPROVED ESC COVER METHODS (E.G., SEEDING, MULCHING, PLASTIC COVERING, ETC.).
8. ANY AREA NEEDING ESC MEASURES, NOT REQUIRING IMMEDIATE ATTENTION, SHALL BE ADDRESSED WITHIN SEVEN (7) DAYS.
9. THE ESC FACILITIES ON INACTIVE SITES SHALL BE INSPECTED AND MAINTAINED A MINIMUM OF ONCE A MONTH OR WITHIN 24 HOURS FOLLOWING A STORM EVENT.
10. AT NO TIME SHALL MORE THAN ONE (1) FOOT OF SEDIMENT BE ALLOWED TO ACCUMULATE WITHIN A CATCH BASIN. ALL CATCH BASINS AND CONVEYANCE LINES SHALL BE CLEANED PRIOR TO PAVING. THE CLEANING OPERATION SHALL NOT FLUSH SEDIMENT–LADEN WATER INTO THE DOWNSTREAM SYSTEM.
11. COVER MEASURES WILL BE APPLIED IN CONFORMANCE WITH APPENDIX O OF THE SURFACE WATER DESIGN MANUAL.
12. PRIOR TO THE BEGINNING OF THE WET SEASON (OCT. 1), ALL DISTURBED AREAS SHALL BE REVIEWED TO IDENTIFY WHICH ONES CAN BE SEEDED IN PREPARATION FOR THE WINTER RAINS. DISTURBED AREAS SHALL BE SEEDED WITHIN ONE WEEK OF THE BEGINNING OF THE WET SEASON. A SKETCH MAP OF THOSE AREAS TO BE SEEDED AND THOSE AREAS TO REMAIN UNCOVERED SHALL BE SUBMITTED TO THE DPER INSPECTOR FOR REVIEW.

STORMWATER POLLUTION PREVENTION AND SPILL NOTES

1. NO LIQUIDS, INCLUDING PETROLEUM PRODUCTS, FUEL, SOLVENTS DETERGENTS, PAINT, PESTICIDES, CONCRETE ADMIXTURES, FORM OILS, ETC. SHALL BE STORED ON SITE.
2. CONSTRUCTION MATERIALS AND WASTES SHALL BE STORED AT THE POTENTIAL STOCKPILE AREA SHOWN ON THESE PLANS.
3. ALL FUELING SHALL BE PROVIDED BY A FUELING TRUCK. NO FUEL SHALL BE STORED ON SITE.
4. THE CONTRACTOR SHALL DESIGNATE A PERSON AS THE RESPONSIBLE REPRESENTATIVE IN CHARGE OF EROSION CONTROL AND MAINTENANCE OF ALL EROSION CONTROL AND STORMWATER POLLUTION PREVENTION FACILITIES.

EXPOSED SOIL PROTECTION NOTE:

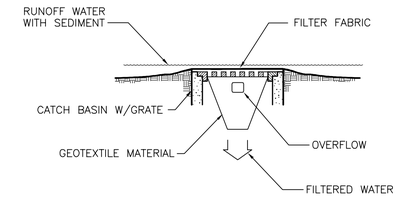
AREAS CLEARED FOR GRADING ACTIVITIES WILL BE TEMPORARILY STABILIZED BY ONE OF THE FOLLOWING METHODS WHICH ARE BASED ON PERIOD EXPOSED SOILS ARE LEFT UNWORKED:

- IF EXPOSED SOILS ARE LEFT UNWORKED FOR MORE THAN 7 DAYS DURING THE DRY SEASON BUT LESS THAN 30 DAYS, MULCHING SHALL BE APPLIED.
- IF EXPOSED SOILS ARE LEFT UNWORKED FOR MORE THAN 30 DAYS, TEMPORARY OR PERMANENT SEEDING SHALL BE APPLIED.

FOLLOWING FINAL OR FINE GRADING ACTIVITY SEED SHALL BE PLACED ON EXPOSED SOIL TO PROVIDE PERMANENT AND IMMEDIATE EROSION PROTECTION. DUST CONTROL WILL BE APPLIED AS NECESSARY DURING DRY PERIODS.

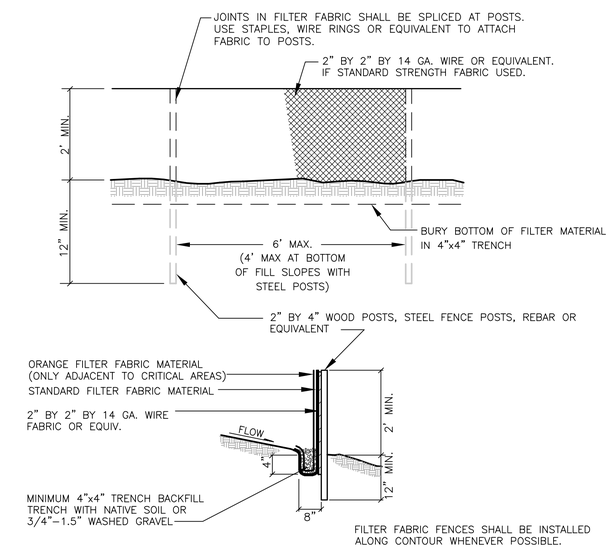
CONSTRUCTION SEQUENCE

1. PRE–CONSTRUCTION MEETING.
2. POST SIGN WITH NAME AND PHONE NUMBER OF ESC SUPERVISOR MAY BE CONSOLIDATED WITH THE REQUIRED NOTICE OF CONSTRUCTION SIGN.
3. INSTALL CATCH BASIN PROTECTION.
4. INSTALL PERIMETER PROTECTION (ORANGE FILTER FENCE).
5. INSTALL TEMPORARY DAMS AT NORTH AND SOUTH ENDS OF FARM DITCH DI WORK AREA.
6. MAINTAIN EROSION CONTROL MEASURES IN ACCORDANCE WITH KING COUNTY STANDARDS AND MANUFACTURER'S RECOMMENDATIONS.
7. RELOCATE EROSION CONTROL MEASURES OR INSTALL NEW MEASURES SO THAT AS SITE CONDITIONS CHANGE THE EROSION AND SEDIMENT CONTROL IS ALWAYS IN ACCORDANCE WITH THE KING COUNTY EROSION AND SEDIMENT CONTROL STANDARDS.
8. COVER ALL AREAS THAT WILL BE UNWORKED FOR MORE THAN SEVEN DAYS DURING THE DRY SEASON.
9. STABILIZE ALL AREAS THAT REACH FINAL GRADE WITHIN SEVEN DAYS.
10. SEED ANY AREAS TO REMAIN UNWORKED FOR MORE THAN 30 DAYS.
11. UPON COMPLETION OF THE PROJECT, ALL DISTURBED AREAS MUST BE STABILIZED AND BMPS REMOVED IF APPROPRIATE.



INLET PROTECTION DETAIL

NOT TO SCALE



1. ANY DAMAGE SHALL BE REPAIRED IMMEDIATELY.
2. IF CONCENTRATED FLOWS ARE EVIDENT UPHILL OF THE FENCE, THEY MUST BE INTERCEPTED AND CONVEYED TO A SEDIMENT TRAP OR POND.
3. IT IS IMPORTANT TO CHECK THE UPHILL SIDE OF THE FENCE FOR SIGNS OF THE FENCE CLOGGING AND ACTING AS A BARRIER TO FLOW AND THEN CAUSING CHANNELIZATION OF FLOWS PARALLEL TO THE FENCE. IF THIS OCCURS, REPLACE THE FENCE AND/OR REMOVE THE TRAPPED SEDIMENT.
4. SEDIMENT MUST BE REMOVED WHEN THE SEDIMENT IS 6" HIGH.
5. IF THE FILTER FABRIC HAS DETERIORATED DUE TO ULTRAVIOLET BREAKDOWN, IT SHALL BE REPLACED.

TYPICAL ORANGE FILTER FENCE DETAIL

NOT TO SCALE

- INSTALL ONLY IF THERE IS WATER IN THE DITCH AND DOWNSTREAM OF WORK AREA.

KING COUNTY DDES APPROVAL	
Review Engineer	Date
Senior Engineer	Date
Scott Smith, P.E. DEVELOPMENT ENGINEER	Date

REVISIONS

NO.	DESCRIPTION/DATE	BY
0	REVISIONS PER EPA 11/30/2016	ESM
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THE ESTATE OF BARBARA J. NELSON

GUNSHY MANOR FARM

EXHIBIT "A" SITE SURVEY, SKETCH, AND/OR DRAWING DEPICTING SITE'S FEATURES AND BOUNDARIES
KING COUNTY WASHINGTON

T.E.S.C. NOTES & DETAILS

JOB NO.:	1359-001-012
DWG. NAME:	EPA-07
DESIGNED BY:	EGL
DRAWN BY:	CJR
CHECKED BY:	
DATE:	05/31/2017
DATE OF PRINT:	

EPA-07

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Plotted By: Don Lapp

EXHIBIT B

Vegetation Plan

(As prepared by Talasaea Consultants)

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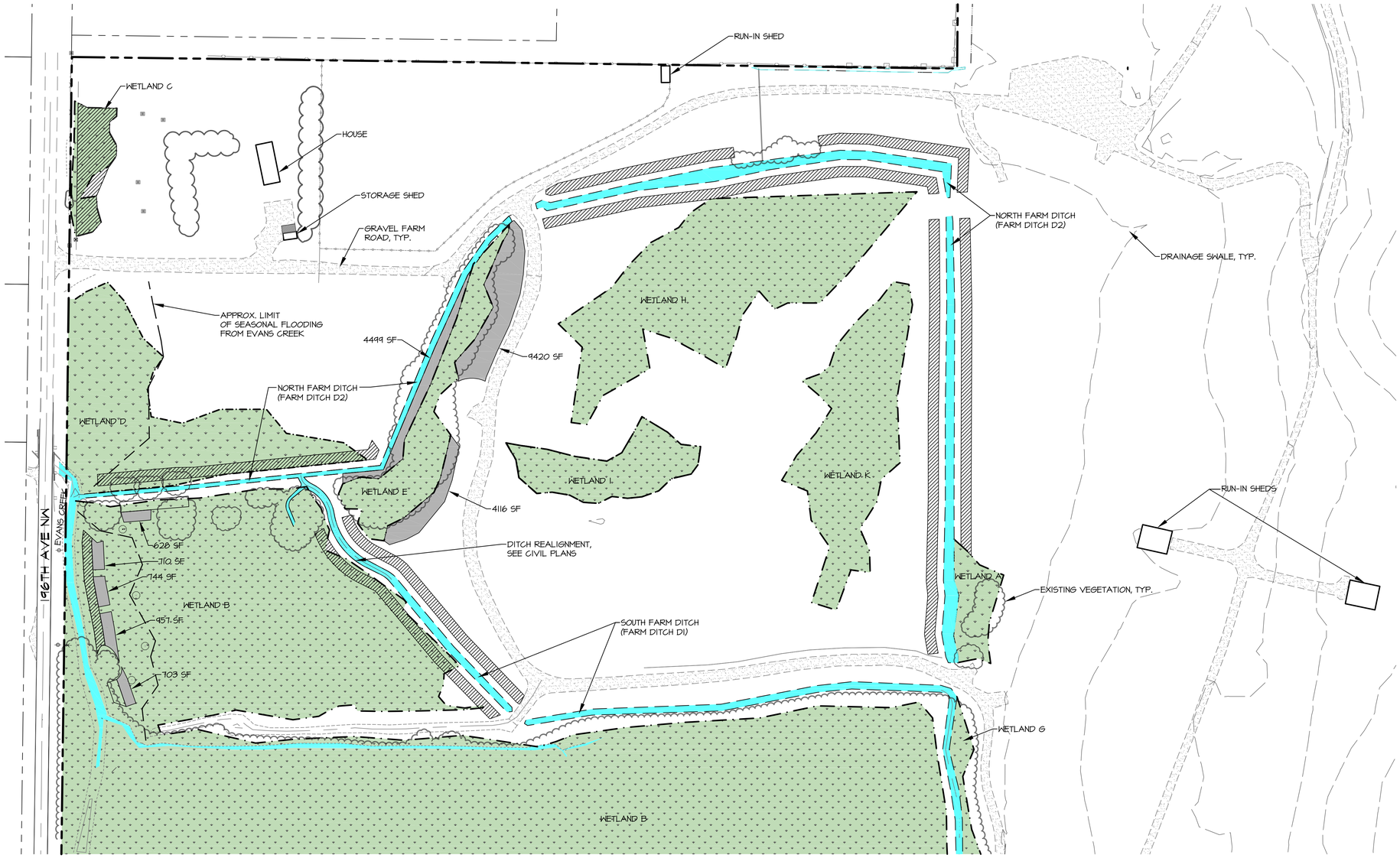


SITE OVERVIEW PLAN

GRAPHIC SCALE (IN FEET)

0 40 80 160

SCALE: 1"=80'

NORTH

PLAN LEGEND

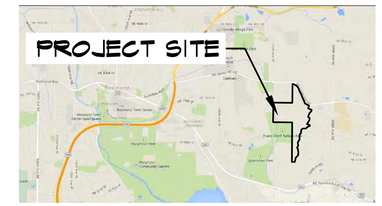
- PROPERTY LINE
- EXISTING WETLAND
- EPA PLANTING AREAS
- DOE PLANTING AREAS
- ESTIMATED SEASONAL FLOODING EXTENT

NOTE: THESE PLANTINGS ARE NOT A MITIGATION REQUIREMENT OF THE EPA OR DOE, BUT A VOLUNTARY ACTION PROPOSED BY BUFF NELSON AS A RESULT OF THE FARM MANAGEMENT PLAN, DEVOLOPED IN CONJUNCTION WITH THE KING COUNTY CONSERVATION DISTRICT.

Know what's **below.**
Call before you dig.

VICINITY MAP

NTS



SOURCE: GOOGLE MAPS; WWW.MAPS.GOOGLE.COM (ACCESSED 01/29/2016)

NORTH

CONTACTS

PROJECT PROPONENT

NAME: WILLIAM C. NELSON, JR.
ADDRESS: 16508 NE 79TH STREET REDMOND, WA 98052
PHONE: (425) 881-7831

PROPERTY OWNER

NAME: ESTATE OF BARBARA NELSON
ADDRESS: 16508 NE 79TH STREET REDMOND, WA 98052
PHONE: (425) 881-7831
CONTACT: WILLIAM C. NELSON, JR. EXECUTOR

ENGINEER AND SURVEYOR

NAME: ESM CONSULTING ENGINEERS, LLC
ADDRESS: 33400 8TH AVE S, STE 205 FEDERAL WAY, WA 98003
PHONE: (800) 345-5694
CONTACT: ERIC LABRIE, A.I.C.P.

ENVIRONMENTAL CONSULTANT

NAME: TALASAEA CONSULTANTS, INC.
ADDRESS: 15020 BEAR CREEK RD. NE WOODINVILLE, WA 98077
PHONE: (425) 861-7550
CONTACT: OLIN ANDERSON, SENIOR LANDSCAPE PLANNER
DAVID TEESDALE, SENIOR WETLAND ECOLOGIST

GENERAL CONTRACTOR

NAME: CASCADE UTILITIES
ADDRESS: 7600 185TH AVE. NE REDMOND, WA 98052
PHONE: (425) 861-8787
CONTACT: ROBERT BAILIE

LANDSCAPE CONTRACTOR

NAME: G&F LANDSCAPE SERVICES
ADDRESS: 107 236TH STREET SE BOTHELL, WA 98021
PHONE: (425) 487-0486
CONTACT: GORDON WEGNER

SHEET INDEX

SHEET NUMBER	SHEET TITLE
W1.0	SITE OVERVIEW PLAN
W2.0	WETLAND C PLANTING PLAN & NOTES
W2.1	PLANTING PLAN
W2.2	PLANTING PLAN
W2.3	PLANTING PLAN, PLANT SCHEDULE, NOTES & DETAILS

NOTES

1. SURVEY AND SITE PLAN PROVIDED BY ESM CONSULTING ENGINEERS, LLC.
2. SOURCE DRAWING WAS MODIFIED BY TALASAEA CONSULTANTS FOR VISUAL ENHANCEMENT.
3. THIS VEGETATION PLAN IS AN ATTACHMENT TO THE FINAL RESTORATION AND MITIGATION WORK PLAN, PREPARED IN JUNE 2017.
4. THIS DIAGRAM IS FOR GENERAL ORIENTATION PURPOSES AND DOES NOT REFLECT AN EPA APPROVED WETLAND DELINEATION OF THE GEOGRAPHIC EXTENT OF WATERS OF THE U.S.

TALASAEA
CONSULTANTS, INC.
Resource & Environmental Planning
15020 Bear Creek Road Northeast – Woodinville, Washington 98077
Box (425) 861-7550 – Fax (425) 861-7549

PLANTING PLAN
SITE OVERVIEW PLAN
GUNSHY MANOR FARM
REDMOND, WASHINGTON

Revisions	Date	By

Date 6-1-2017
Scale AS SHOWN
Designed OA/MN
Drawn OA/MN
Checked AO
Approved BS

Project # TAL-1147

Sheet # W1.0

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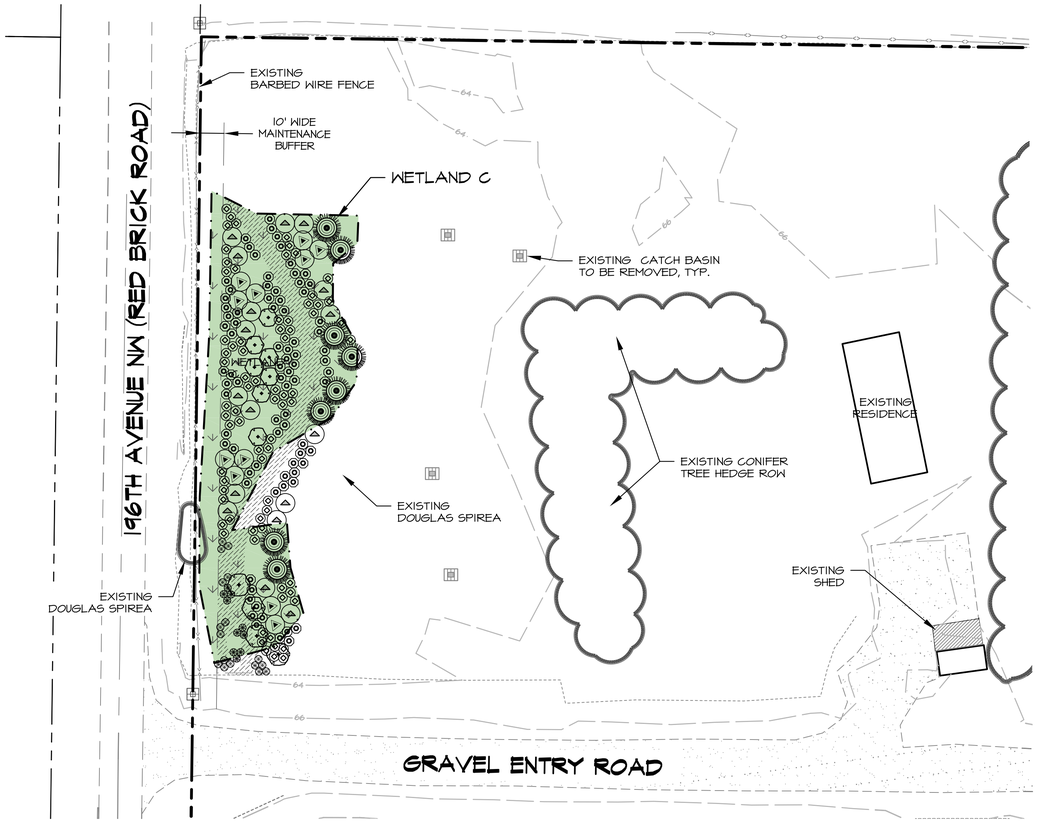
Plotted June 1, 2017



WETLAND C PLANTING PLAN

GRAPHIC SCALE (IN FEET)
0 10 30 60
SCALE: 1"=30'

NORTH

PLAN LEGEND

- PROPERTY LINE
- EXISTING WETLAND
- 100 EXISTING 2 FT CONTOUR
- TOE OF SLOPE

PLANT SPECIES LIST

CONIFEROUS TREES

SCIENTIFIC NAME	COMMON NAME	WL STATUS	SPACING	SIZE (MIN)	NOTES
PICEA SITCHENSIS	SITKA SPRUCE	FAC	AS SHOWN	2-3' HT.	B&B, FULL & BUSHY
PINUS CONTORTA VAR. CONTORTA	SHORE PINE	FAC	AS SHOWN	2-3' HT.	B&B, FULL & BUSHY
THUJA PLICATA	WESTERN RED CEDAR	FAC	AS SHOWN	2-3' HT.	B&B, FULL & BUSHY

SMALL TREE/LARGE SHRUBS

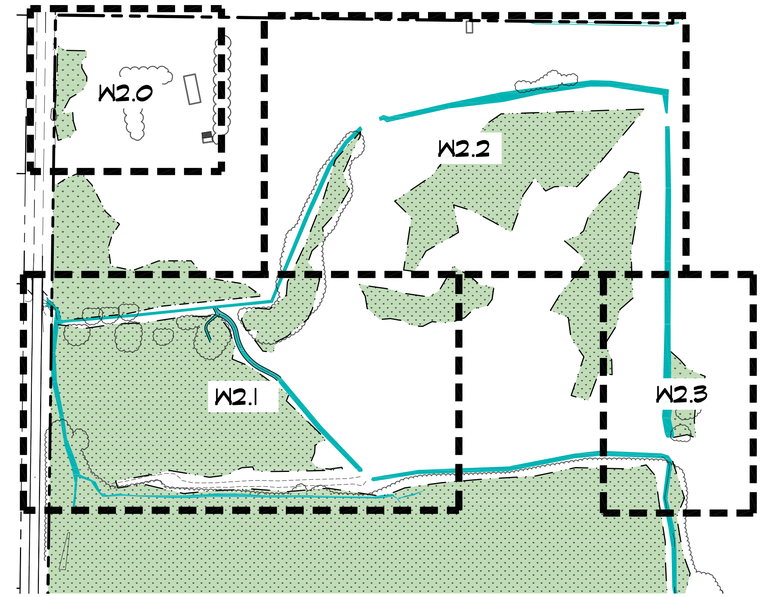
SCIENTIFIC NAME	COMMON NAME	WL STATUS	SPACING	SIZE (MIN)	NOTES
ACER GIRGINATUM	VINE MAPLE	FAC	AS SHOWN	24" HT.	SINGLE TRUNK
CRATAEGUS DOUGLASII	BLACK HAWTHORN	FAC	AS SHOWN	24" HT.	SINGLE TRUNK
MYRICA CALIFORNICA	PACIFIC WAXMYRTLE	FACW	AS SHOWN	24" HT.	SINGLE TRUNK
PHYSOCARPUS CAPITATUS	PACIFIC NINEBARK	FACW	AS SHOWN	24" HT.	SINGLE TRUNK
RHAMNUS PURSHIANA (FRANGULA P.)	CASCARA	FAC	AS SHOWN	24" HT.	SINGLE TRUNK
RIBES SANGUINEUM	RED-FLOWERING CURRANT	NL	AS SHOWN	24" HT.	MULTI-CANE (3 MIN.)

MASSING SHRUBS

SCIENTIFIC NAME	COMMON NAME	WL STATUS	SPACING	SIZE (MIN)	NOTES
CORNUS SERICEA	RED-OSIER DOGWOOD	FACW	4' O.C.	NA	4' CUTTING
LONICERA INVOLUCRATA	BLACK TWIN-BERRY	FAC	4' O.C.	NA	4' CUTTING
MAHONIA AQUIFOLIUM	OREGON GRAPE	FAC	4' O.C.	18" HT.	MULTI-CANE (3 MIN.)
MYRICA GALE	SWEET GALE	FACW	4' O.C.	18" HT.	MULTI-CANE (3 MIN.)
ROSA NUTKANA	NOOTKA ROSE	FAC	4' O.C.	18" HT.	MULTI-CANE (3 MIN.)
ROSA PISOCARPA	CLUSTERED WILD ROSE	FAC	4' O.C.	18" HT.	MULTI-CANE (3 MIN.)
SYMPHORICARPOS ALBUS	COMMON SNOWBERRY	FACU	4' O.C.	NA	4' CUTTING

GRASSES & PERENNIALS (WETLAND C ONLY)

SCIENTIFIC NAME	COMMON NAME	WL STATUS	SPACING	SIZE (MIN)	NOTES
IRIS TENAX	OREGON IRIS	N/L	3' O.C.	1 GAL., 6" HT. MIN.	FULL AND BUSHY
SYMPHYOTRICHUM SUBSPICATUM	DOUGLAS ASTER	FACW	3' O.C.	1 GAL., 6" HT. MIN.	FULL AND BUSHY
JUNCUS EFFUSUS, CAREX OBNUPTA, SISYRINCHIUM IDAHOENSE	MIXED NATIVE PERENNIALS AND EVERGREEN GRAMINOIDS	FACW, OBL, FACW	3' O.C.	1 GAL., 6" HT. MIN.	FULL AND BUSHY



SHEET KEY

GRAPHIC SCALE (IN FEET)
0 75 150 300
SCALE: 1"=150'

NORTH

PLANTING SEQUENCE

1. SITE PREPARATION FOR TREE AND SHRUB PLANTING WILL OCCUR FOLLOWING ANY PROPOSED GRADING OR OTHER MAJOR DISTURBANCES IN PLANTING AREAS.
2. CONTRACTOR TO COORDINATE WITH OWNER AND TALASAEA CONSULTANTS PRIOR TO BEGINNING WORK.
3. PLANTING SHALL BE SCHEDULED TO OCCUR IN THE FALL, WHEN CONDITIONS ARE FAVORABLE FOR NATIVE PLANT SURVIVAL.
4. SURVEY PLANTING AREAS AND MARK PERIMETERS WITH LATH STAKES.
5. PREPARE PLANTING AREAS BY REMOVING RUBBLE, TRASH, CONSTRUCTION DEBRIS, AND MOWING GRASSES AT LOWEST PRACTICAL SETTING.
6. FLAG OR MARK PLANT LOCATIONS ACCORDING TO PLAN, THEN HAVE PLANTING LAYOUT REVIEWED BY TALASAEA CONSULTANTS FOR ANY NECESSARY ADJUSTMENTS.
7. CLEAR PLANTING RING AND EXCAVATE HOLES FOR PLANTS WITH MECHANICAL AUGER, SKID-STEER MOUNTED AUGER, OR WITH HAND TOOLS. HOLES TO BE DUG TO DEPTH OF INSTALLED PLANT CONTAINER SIZE, AND 2.5 TIMES THE WIDTH OF PLANT CONTAINER SIZE.
8. IF NECESSARY, SOILS MAY NEED LOOSENING AND/OR AMENDING WITH COMPOST OR TOPSOIL.
9. PRE-WATER HOLES PRIOR TO PLANTING, IF CONDITIONS ARE DRY.
10. PLACE PLANTS PER GENERAL PLANT INSTALLATION NOTES.
11. PLACE MULCH IN RINGS AROUND PLANTS, AT A MINIMUM OF 24" DIAMETER AND 3" DEPTH.
12. TALASAEA CONSULTANTS SHALL INSPECT PLANTING TO ENSURE PROPER INSTALLATION, AND MAY DIRECT CHANGES AS NECESSARY.
13. INSTALL BEAVER FENCING (HOGWIRE OR SIMILAR) AS NEEDED AROUND PLANTING AREAS.
14. INSTALL TEMPORARY IRRIGATION SYSTEM, TO BE UTILIZED AT A MINIMUM OF ONE YEAR FOLLOWING PLANTING, AND PROVIDE WATER PER THE GENERAL PLANT INSTALLATION NOTES. IRRIGATION AMOUNTS AND FREQUENCY MAY BE MODIFIED UNDER APPROVAL FROM TALASAEA CONSULTANTS.
15. MAINTAIN SITE PER THE FINAL RESTORATION AND MITIGATION WORK PLAN, INCLUDING MAINTAINING GRASS BETWEEN PLANTS IN A MOWED OR TRIMMED CONDITION TO REDUCE PLANT COMPETITION.

NOTES

1. SURVEY AND SITE PLAN PROVIDED BY ESM CONSULTING ENGINEERS, LLC.
2. SOURCE DRAWING WAS MODIFIED BY TALASAEA CONSULTANTS FOR VISUAL ENHANCEMENT.
3. THIS VEGETATION PLAN IS AN ATTACHMENT TO THE FINAL RESTORATION AND MITIGATION WORK PLAN, PREPARED IN JUNE 2017.
4. THIS DIAGRAM IS FOR GENERAL ORIENTATION PURPOSES AND DOES NOT REFLECT AN EPA APPROVED WETLAND DELINEATION OF THE GEOGRAPHIC EXTENT OF WATERS OF THE U.S.

811 Know what's below. Call before you dig.

TALASAEA CONSULTANTS, INC.
Resource & Environmental Planning
15020 Bear Creek Road Northeast – Woodinville, Washington 98077
Box (425) 861-7500 – Fax (425) 861-7749

PLANTING PLAN WETLAND C PLANTING PLAN & NOTES GUNSHY MANOR FARM REDMOND, WASHINGTON

Revisions	Date	By

Date 6-1-2017
Scale AS SHOWN
Designed OA/MN
Drawn OA/MN
Checked AO
Approved BS

Project #TAL-1147

Sheet # W2.0

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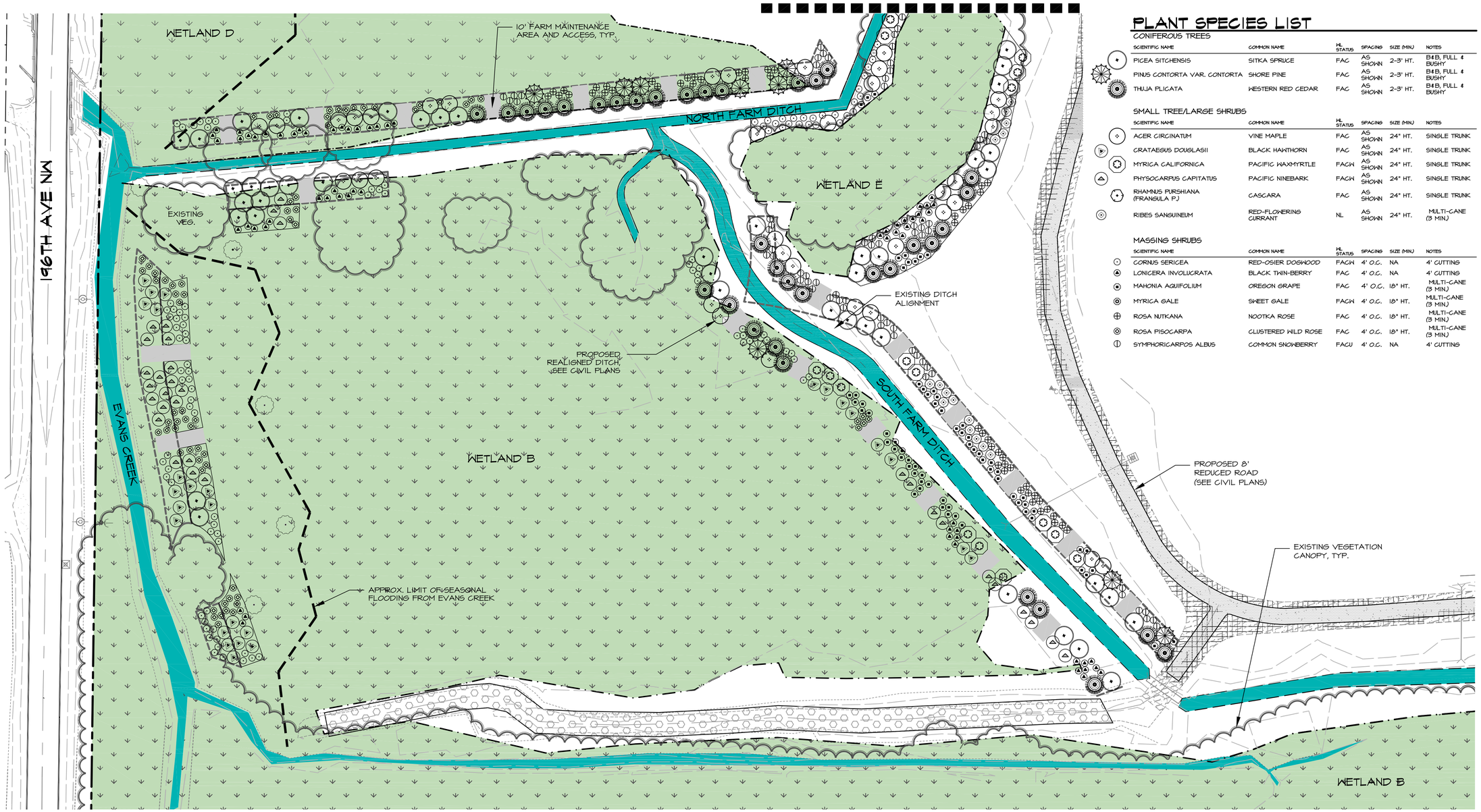
Plotted June 1, 2017



PLANT SPECIES LIST

CONIFEROUS TREES

SCIENTIFIC NAME	COMMON NAME	WL STATUS	SPACING	SIZE (MIN.)	NOTES
PICEA SITCHENSIS	SITKA SPRUCE	FAC	AS SHOWN	2-3' HT.	B&B, FULL & BUSHY
PINUS CONTORTA VAR. CONTORTA	SHORE PINE	FAC	AS SHOWN	2-3' HT.	B&B, FULL & BUSHY
THUJA PLICATA	WESTERN RED CEDAR	FAC	AS SHOWN	2-3' HT.	B&B, FULL & BUSHY

SMALL TREE/LARGE SHRUBS

SCIENTIFIC NAME	COMMON NAME	WL STATUS	SPACING	SIZE (MIN.)	NOTES
ACER CIRCINATUM	VINE MAPLE	FAC	AS SHOWN	24" HT.	SINGLE TRUNK
CRATAEGUS DOUGLASII	BLACK HAWTHORN	FAC	AS SHOWN	24" HT.	SINGLE TRUNK
MYRICA CALIFORNICA	PACIFIC WAXMYRTLE	FACW	AS SHOWN	24" HT.	SINGLE TRUNK
PHYSOCARPUS CAPITATUS	PACIFIC NINEBARK	FACW	AS SHOWN	24" HT.	SINGLE TRUNK
RHAMNUS PURSHIANA (FRANGULA P.)	CASCARA	FAC	AS SHOWN	24" HT.	SINGLE TRUNK
RIBES SANGUINEUM	RED-FLOWERING CURRANT	NL	AS SHOWN	24" HT.	MULTI-CANE (3 MIN.)

MASSING SHRUBS

SCIENTIFIC NAME	COMMON NAME	WL STATUS	SPACING	SIZE (MIN.)	NOTES
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LONICERA INVOLUCRATA	BLACK TWIN-BERRY	FAC	4' O.C.	NA	4' CUTTING
MAHONIA AQUIFOLIUM	OREGON GRAPE	FAC	4' O.C.	18" HT.	MULTI-CANE (3 MIN.)
MYRICA GALE	SWEET GALE	FACW	4' O.C.	18" HT.	MULTI-CANE (3 MIN.)
ROSA NUTKANA	NOOTKA ROSE	FAC	4' O.C.	18" HT.	MULTI-CANE (3 MIN.)
ROSA PISOCARPA	CLUSTERED WILD ROSE	FAC	4' O.C.	18" HT.	MULTI-CANE (3 MIN.)
SYMPHORICARPOS ALBUS	COMMON SNOWBERRY	FACU	4' O.C.	NA	4' CUTTING

PLANTING PLAN

GRAPHIC SCALE (IN FEET)
0 15' 30' 60'
SCALE: 1"=30'
NORTH

PLAN LEGEND

- PROPERTY LINE
- EXISTING WETLAND
- 100 EXISTING 2 FT CONTOUR

NOTES

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2. SOURCE DRAWING WAS MODIFIED BY TALASAEA CONSULTANTS FOR VISUAL ENHANCEMENT.
3. THIS VEGETATION PLAN IS AN ATTACHMENT TO THE FINAL RESTORATION AND MITIGATION WORK PLAN, PREPARED IN JUNE 2017.
4. THIS DIAGRAM IS FOR GENERAL ORIENTATION PURPOSES AND DOES NOT REFLECT AN EPA APPROVED WETLAND DELINEATION OF THE GEOGRAPHIC EXTENT OF WATERS OF THE U.S.

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TALASAEA CONSULTANTS, INC.
Resource & Environmental Planning
15020 Bear Creek Road Northeast - Woodinville, Washington 98077
Bus (425) 861-7550 - Fax (425) 861-7549

PLANTING PLAN
PLANTING PLAN
GUNSHY MANOR FARM
REDMOND, WASHINGTON

Revisions	Date	By

Date 6-1-2017
Scale AS SHOWN
Designed OA/MW
Drawn OA/MW
Checked AO
Approved BS

Project # TAL-1147

Sheet # W2.1

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Plotted June 1, 2017

PLANT SPECIES LIST

CONIFEROUS TREES

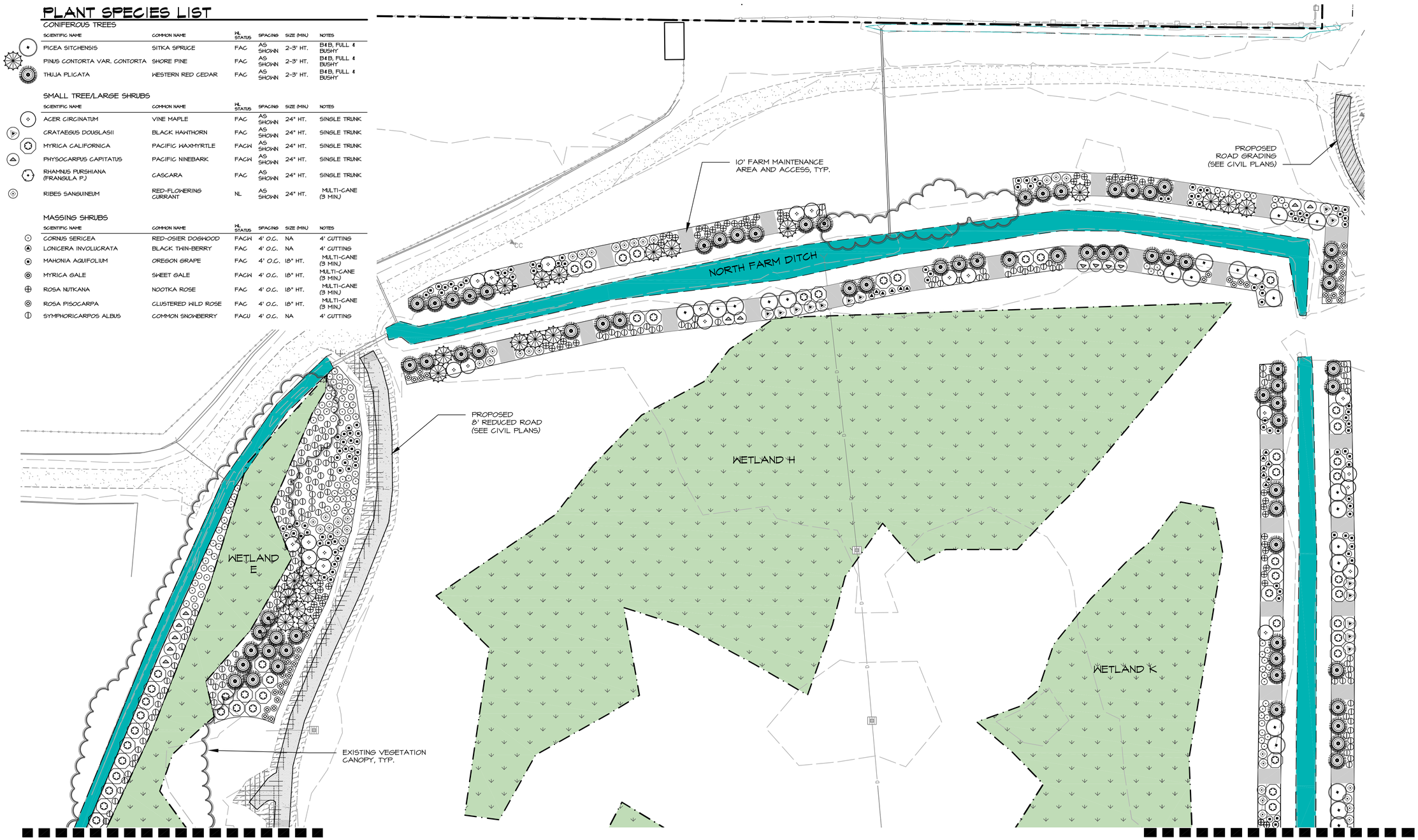
SCIENTIFIC NAME	COMMON NAME	NL STATUS	SPACING	SIZE (MIN)	NOTES
PICEA SITCHENSIS	SITKA SPRUCE	FAC	AS SHOWN	2-3' HT.	B&B, FULL & BUSHY
PINUS CONTORTA VAR. CONTORTA	SHORE PINE	FAC	AS SHOWN	2-3' HT.	B&B, FULL & BUSHY
THUJA PLICATA	WESTERN RED CEDAR	FAC	AS SHOWN	2-3' HT.	B&B, FULL & BUSHY

SMALL TREE/LARGE SHRUBS

SCIENTIFIC NAME	COMMON NAME	NL STATUS	SPACING	SIZE (MIN)	NOTES
ACER CIRCINATUM	VINE MAPLE	FAC	AS SHOWN	24" HT.	SINGLE TRUNK
CRATAEGUS DOUGLASII	BLACK HAWTHORN	FAC	AS SHOWN	24" HT.	SINGLE TRUNK
MYRICA CALIFORNICA	PACIFIC WAXMYRTLE	FACW	AS SHOWN	24" HT.	SINGLE TRUNK
PHYSOCARPUS CAPITATUS	PACIFIC NINEBARK	FACW	AS SHOWN	24" HT.	SINGLE TRUNK
RHAMNUS PURSHIANA (FRANGULA P.)	CASCARA	FAC	AS SHOWN	24" HT.	SINGLE TRUNK
RIBES SANGUINEUM	RED-FLOWERING CURRANT	NL	AS SHOWN	24" HT.	MULTI-CANE (3 MIN.)

MASSING SHRUBS

SCIENTIFIC NAME	COMMON NAME	NL STATUS	SPACING	SIZE (MIN)	NOTES
CORNUS SERICEA	RED-OSIER DOGWOOD	FACW	4' O.C.	NA	4' CUTTING
LONICERA INVOLUCRATA	BLACK TWIN-BERRY	FAC	4' O.C.	NA	4' CUTTING
MAHONIA AQUIFOLIUM	OREGON GRAPE	FAC	4' O.C.	18" HT.	MULTI-CANE (3 MIN.)
MYRICA GALE	SWEET GALE	FACW	4' O.C.	18" HT.	MULTI-CANE (3 MIN.)
ROSA NUTKANA	NOOTKA ROSE	FAC	4' O.C.	18" HT.	MULTI-CANE (3 MIN.)
ROSA PISOCARPA	CLUSTERED WILD ROSE	FAC	4' O.C.	18" HT.	MULTI-CANE (3 MIN.)
SYMPHORICARPOS ALBUS	COMMON SNOWBERRY	FACU	4' O.C.	NA	4' CUTTING



PLANTING PLAN

GRAPHIC SCALE (IN FEET)
0 15 30 60
SCALE: 1"=30'

NORTH

PLAN LEGEND

- PROPERTY LINE
- EXISTING WETLAND
- 100 EXISTING 2 FT CONTOUR

NOTES

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Sheet # W2.2

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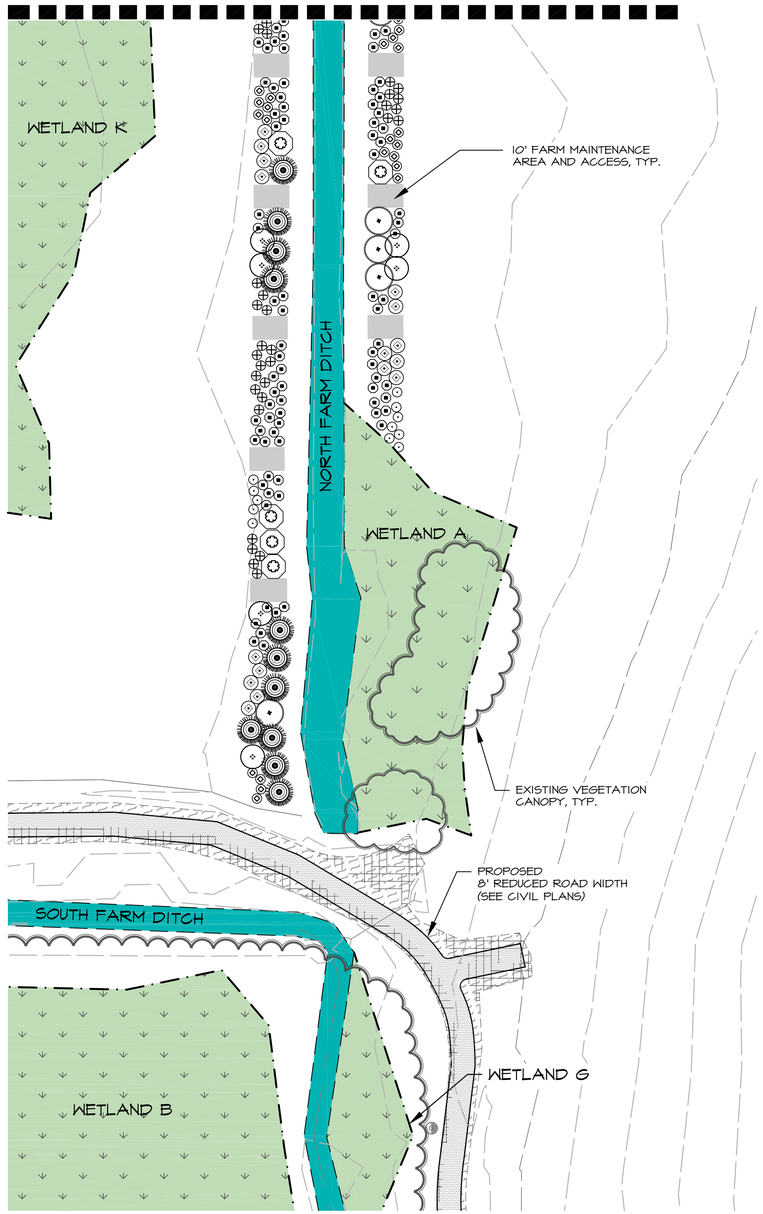


PLANTING PLAN

GRAPHIC SCALE (IN FEET)
0 15 30' 30'
SCALE: 1"=30'
NORTH

PLAN LEGEND

- PROPERTY LINE
- EXISTING WETLAND
- 100 EXISTING 2 FT CONTOUR

PLANT SCHEDULE

CONIFEROUS TREES

SCIENTIFIC NAME	COMMON NAME	EPA QTY.	DOE QTY.	WL STATUS	SPACING	SIZE (MIN.)	NOTES
PICEA SITCHENSIS	SITKA SPRUCE	57	13	FAC	AS SHOWN	2-3' HT.	B&B, FULL & BUSHY
PINUS CONTORTA VAR. CONTORTA	SHORE PINE	24	7	FAC	AS SHOWN	2-3' HT.	B&B, FULL & BUSHY
THUJA PLICATA	WESTERN RED CEDAR	111	18	FAC	AS SHOWN	2-3' HT.	B&B, FULL & BUSHY
	SUBTOTAL:	192	38				

SMALL TREE/LARGE SHRUB

SCIENTIFIC NAME	COMMON NAME	EPA QTY.	DOE QTY.	WL STATUS	SPACING	SIZE (MIN.)	NOTES
ACER CIRCINATUM	VINE MAPLE	47	18	FAC	AS SHOWN	24" HT.	SINGLE TRUNK
CRATAEGUS DOUGLASII	BLACK HAWTHORN	44	8	FAC	AS SHOWN	24" HT.	SINGLE TRUNK
MYRICA CALIFORNICA	PACIFIC WAXMYRTLE	47	24	FACW	AS SHOWN	24" HT.	SINGLE TRUNK
PHYSOCARPUS CAPITATUS	PACIFIC NINEBARK	46	16	FACW	AS SHOWN	24" HT.	SINGLE TRUNK
RHAMNUS PURSHIANA (FRANGULA P.)	CASCARA	11	-	FAC	AS SHOWN	24" HT.	SINGLE TRUNK
RIBES SANGUINEUM	RED-FLOWERING CURRANT	52	14	NL	AS SHOWN	18" HT.	MULTI-CANE (3 MIN.)
	SUBTOTAL:	247	80				

MASSING SHRUB

SCIENTIFIC NAME	COMMON NAME	EPA QTY.	DOE QTY.	WL STATUS	SPACING	SIZE (MIN.)	NOTES
CORNUS ALBA	RED-OSIER DOGWOOD	134	131	FACW	4' O.C.	NA	4' CUTTING
LONICERA INVOLUCRATA	BLACK TWIN-BERRY	54	24	FAC	4' O.C.	NA	4' CUTTING
MAHONIA AQUIFOLIUM	OREGON GRAPE	220	50	FAC	4' O.C.	18" HT.	MULTI-CANE (3 MIN.)
MYRICA GALE	SWEET GALE	82	-	OBL	4' O.C.	18" HT.	MULTI-CANE (3 MIN.)
ROSA NUTKANA	NOOTKA ROSE	126	17	FAC	4' O.C.	18" HT.	MULTI-CANE (3 MIN.)
ROSA PISOCARPA	CLUSTERED WILD ROSE	156	48	FAC	4' O.C.	18" HT.	MULTI-CANE (3 MIN.)
SYMPHORICARPOS ALBUS	COMMON SNOWBERRY	106	133	FACU	4' O.C.	NA	4' CUTTING
	SUBTOTAL:	883	403				

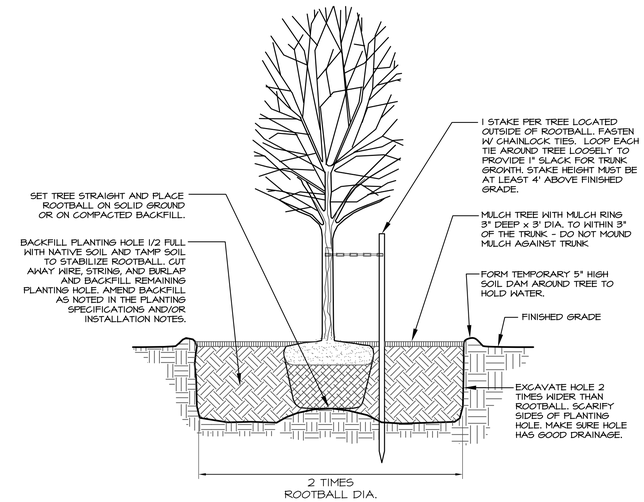
	EPA QTY.	DOE QTY.
TOTAL WOODY PLANTS:	1,322	521

GRASSES & PERENNIALS (WETLAND C ONLY)

SCIENTIFIC NAME	COMMON NAME	QTY.	WL STATUS	SPACING	SIZE (MIN.)	NOTES
IRIS TENAX	OREGON IRIS	17	17	3' O.C.	1 GAL., 6" HT. MIN.	FULL & BUSHY
SYMPHYOTRICHUM SUBSPICATUM	DOUGLAS ASTER	10	10	3' O.C.	1 GAL., 6" HT. MIN.	FULL & BUSHY
JUNCUS EFFUSUS, CAREX OBNUPTA, SISYRINCHIUM IDAHOENSE	MIXED NATIVE PERENNIALS AND EVERGREEN GRAMINOIDES.	213	213	3' O.C.	1 GAL., 6" HT. MIN.	FULL & BUSHY

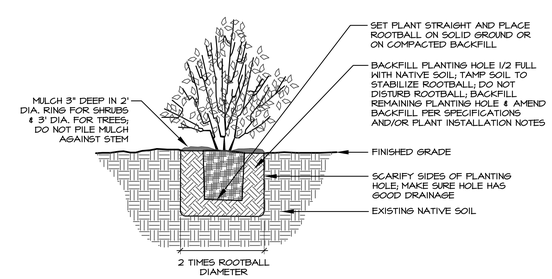
GENERAL PLANT INSTALLATION NOTES

1. PLANT TREES AND/OR SHRUBS 1" HIGHER THAN DEPTH GROWN AT NURSERY.
2. FOR CONTAINER TREES AND/OR SHRUBS, SCORE FOUR SIDES OF ROOTBALL PRIOR TO PLANTING. BUTTERFLY ROOTBALL IF ROOT CIRCLING IS EVIDENT.
3. STAKE DECIDUOUS AND EVERGREEN TREES 4 FEET AND OVER IN HEIGHT WITH ONE (1) STAKE PER TREE. STAKE TREES IMMEDIATELY AFTER PLANTING. PLACE STAKE AT THE OUTER EDGE OF THE ROOTS OR ROOTBALL, IN LINE WITH THE PREVAILING WIND. STAKES SHALL BE LOOSELY ATTACHED USING CHAIN-LOCK TREE TIES TO ALLOW FOR SOME TRUNK MOVEMENT.
4. TREE STAKES TO BE VERTICAL, PARALLEL, EVEN-TOPPED, UNSCARRED AND DRIVEN INTO UNDISTURBED SUBGRADE. REMOVE AFTER ONE YEAR.
5. WATER PLANTS IMMEDIATELY UPON PLANTING, THEN PROVIDE MANUAL WATERING OR A TEMPORARY IRRIGATION SYSTEM, TO THE EXTENT NEEDED, IN ORDER TO PREVENT PLANT MORTALITY AND ENSURE PROPER PLANT ESTABLISHMENT. PLANTS SHALL RECEIVE A MINIMUM OF APPROXIMATELY ONE INCH OF WATER EVERY WEEK DURING THE DRY SEASON (GENERALLY JUNE 15TH - OCTOBER 15TH, OR EARLIER OR LATER IF CONDITIONS WARRANT) FOR THE FIRST SEASON AFTER PLANTING. IRRIGATION AMOUNTS MAY NEED TO BE INCREASED DURING PROLONGED PERIODS OF HOT, DRY WEATHER.
6. FERTILIZE ALL TREES AND SHRUBS WITH A SLOW-RELEASE GENERAL PURPOSE GRANULAR FERTILIZER OR SLOW-RELEASE TABLETS AT MANUFACTURER'S SPECIFIED RATE.
7. APPLY PLANT PROTECTION TUBES, OR SIMILAR DEVICES, ON EACH PLANT TO PROTECT FROM PREDATION BY SMALL MAMMALS.



1 B&B TREE PLANTING DETAIL.

NTS



2 CONTAINER STOCK PLANTING DETAIL

N.T.S.

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PLANTING PLAN
PLANTING PLAN, PLANT SCHEDULE, NOTES & DETAILS
GUNSHY MANOR FARM
REDMOND, WASHINGTON

Revisions	Date	By

Date 6-1-2017
Scale AS SHOWN
Designed OA/MN
Drawn OA/MN
Checked AO
Approved BS

Project # TAL-1147

Sheet # W2.3

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Plotted June 1, 2017

EXHIBIT C

Property Survey

(As Prepared by ESM)

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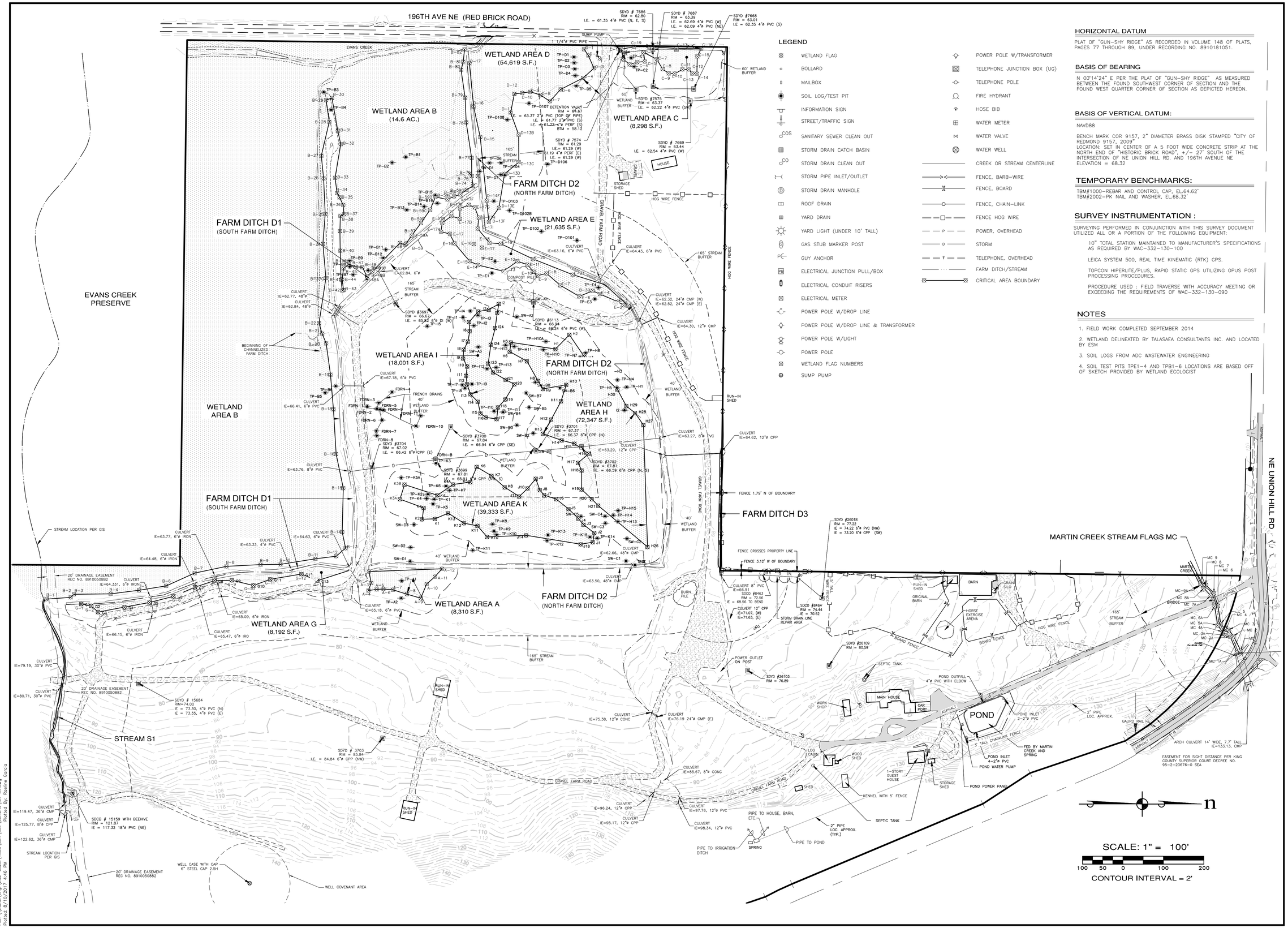

LEGEND

- WETLAND FLAG
- BOLLARD
- MAILBOX
- SOIL LOG/TEST PIT
- INFORMATION SIGN
- STREET/TRAFFIC SIGN
- SANITARY SEWER CLEAN OUT
- STORM DRAIN CATCH BASIN
- STORM DRAIN CLEAN OUT
- STORM PIPE INLET/OUTLET
- STORM DRAIN MANHOLE
- ROOF DRAIN
- YARD DRAIN
- YARD LIGHT (UNDER 10' TALL)
- GAS STUB MARKER POST
- GUY ANCHOR
- ELECTRICAL JUNCTION PULL/BOX
- ELECTRICAL CONDUIT RISERS
- ELECTRICAL METER
- POWER POLE W/DROP LINE
- POWER POLE W/DROP LINE & TRANSFORMER
- POWER POLE W/LIGHT
- POWER POLE
- WETLAND FLAG NUMBERS
- SUMP PUMP
- POWER POLE W/TRANSFORMER
- TELEPHONE JUNCTION BOX (UG)
- TELEPHONE POLE
- FIRE HYDRANT
- HOSE BIB
- WATER METER
- WATER VALVE
- WATER WELL
- CREEK OR STREAM CENTERLINE
- FENCE, BARB-WIRE
- FENCE, BOARD
- FENCE, CHAIN-LINK
- FENCE HOG WIRE
- POWER, OVERHEAD
- STORM
- TELEPHONE, OVERHEAD
- FARM DITCH/STREAM
- CRITICAL AREA BOUNDARY

HORIZONTAL DATUM

PLAT OF "GUN-SHY RIDGE" AS RECORDED IN VOLUME 148 OF PLATS, PAGES 77 THROUGH 89, UNDER RECORDING NO. 8910181051.

BASIS OF BEARING

N 00°14'24" E PER THE PLAT OF "GUN-SHY RIDGE" AS MEASURED BETWEEN THE FOUND SOUTHWEST CORNER OF SECTION AND THE FOUND WEST QUARTER CORNER OF SECTION AS DEPICTED HEREON.

BASIS OF VERTICAL DATUM:

NAVD88

BENCH MARK COR 9157, 2" DIAMETER BRASS DISK STAMPED "CITY OF REDMOND 9157, 2009".
LOCATION: SET IN CENTER OF A 5 FOOT WIDE CONCRETE STRIP AT THE NORTH END OF "HISTORIC BRICK ROAD", +/- 27' SOUTH OF THE INTERSECTION OF NE UNION HILL RD. AND 196TH AVENUE NE
ELEVATION = 68.32

TEMPORARY BENCHMARKS:

TBM#1000-REBAR AND CONTROL CAP, EL.64.62'
TBM#2002-PK NAIL AND WASHER, EL.68.32'

SURVEY INSTRUMENTATION :

SURVEYING PERFORMED IN CONJUNCTION WITH THIS SURVEY DOCUMENT UTILIZED ALL OR A PORTION OF THE FOLLOWING EQUIPMENT:

10" TOTAL STATION MAINTAINED TO MANUFACTURER'S SPECIFICATIONS AS REQUIRED BY WAC-332-130-100

LEICA SYSTEM 500, REAL TIME KINEMATIC (RTK) GPS.

TOPCON HIPERLITE/PLUS, RAPID STATIC GPS UTILIZING OPUS POST PROCESSING PROCEDURES.

PROCEDURE USED : FIELD TRAVERSE WITH ACCURACY MEETING OR EXCEEDING THE REQUIREMENTS OF WAC-332-130-090

NOTES

1. FIELD WORK COMPLETED SEPTEMBER 2014
2. WETLAND DELINEATED BY TALASAEA CONSULTANTS INC. AND LOCATED BY ESM
3. SOIL LOGS FROM ADC WASTEWATER ENGINEERING
4. SOIL TEST PITS TPE1-4 AND TPB1-6 LOCATIONS ARE BASED OFF OF SKETCH PROVIDED BY WETLAND ECOLOGIST

REVISIONS

NO.	DESCRIPTION/DATE	BY

ESM CONSULTING ENGINEERS LLC
33400 8th Ave S, Suite 205
Federal Way, WA 98003
FEDERAL WAY (253) 838-6113
EVERETT (425) 297-9900
www.esmcivil.com
Civil Engineering | Land Surveying | Land Planning
Public Works | Project Management | Landscape Architecture

NELSON ESTATES

GUNSHY MANOR

EXHIBIT "C" SITE TOPOGRAPHIC SURVEY

KING COUNTY WASHINGTON

JOB NO.:	1359-001-012
DWG. NAME:	SR-09
DESIGNED BY:	
DRAWN BY:	RFG
CHECKED BY:	
DATE:	08/10/2017
DATE OF PRINT:	

SR-09

1 OF 1 SHEETS

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Plotted: 8/10/2017 4:46 PM
Plotted By: Rosina Garcia

Appendix G

Planting Plan

(prepared by Talasaea Consultants)

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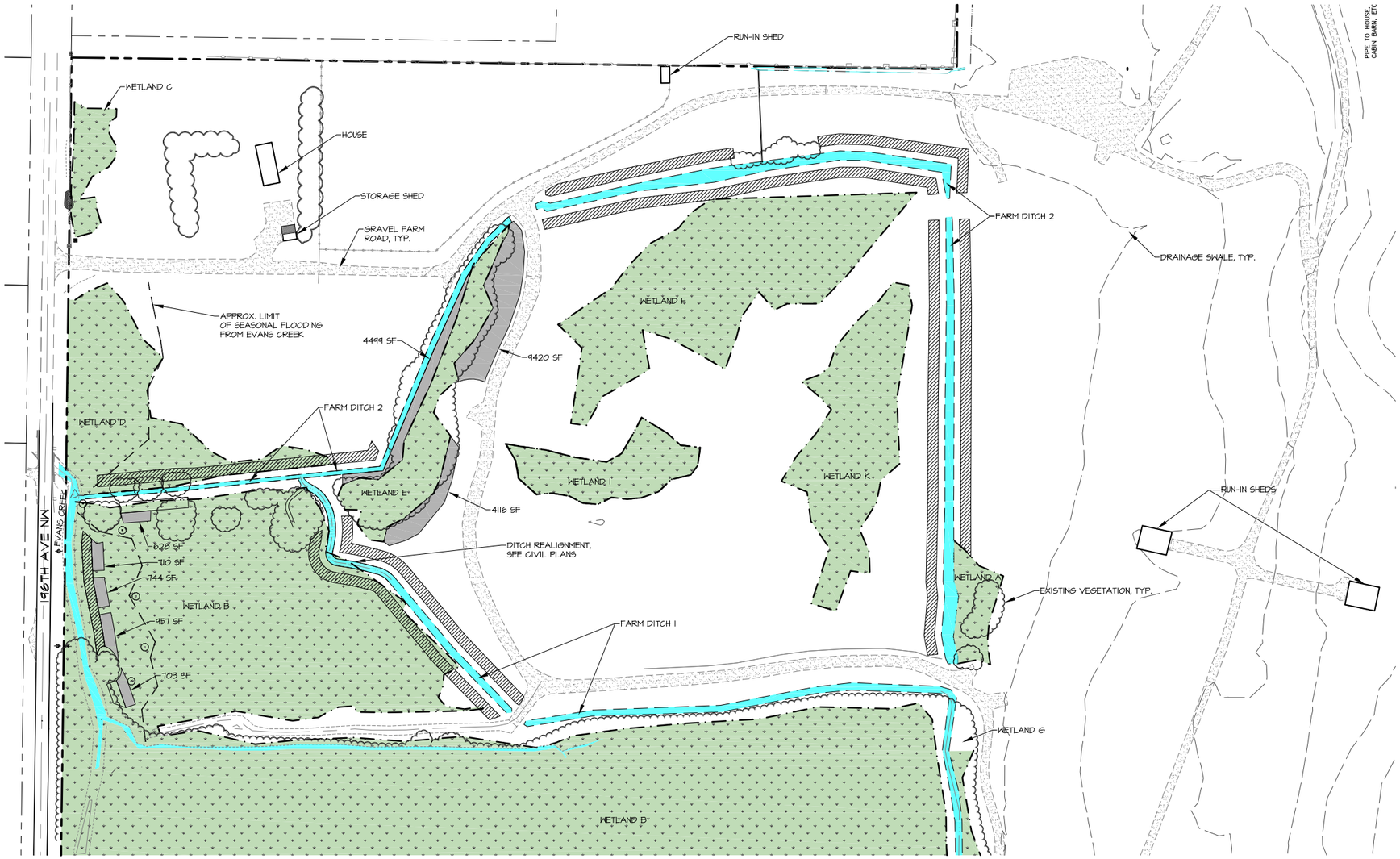

SITE OVERVIEW PLAN

GRAPHIC SCALE (IN FEET)

0 40 80 160

SCALE: 1"=80'

NORTH

PLAN LEGEND

- PROPERTY LINE
- EXISTING WETLAND
- EPA PLANTING AREAS
- DOE PLANTING AREAS
- ESTIMATED SEASONAL FLOODING EXTENT

VICINITY MAP

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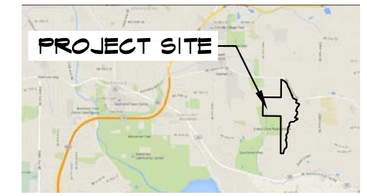

SOURCE: GOOGLE MAPS; WWW.MAPS.GOOGLE.COM (ACCESSED 01/24/2016)

NORTH

CONTACTS

PROJECT PROPONENT

NAME: WILLIAM C. NELSON, JR.
ADDRESS: 16508 NE 74TH STREET REDMOND, WA 98052
PHONE: (425) 881-7831

PROPERTY OWNER

NAME: ESTATE OF BARBARA NELSON
ADDRESS: 16508 NE 74TH STREET REDMOND, WA 98052
PHONE: (425) 881-7831
CONTACT: WILLIAM C. NELSON, JR. EXECUTOR

ENGINEER AND SURVEYOR

NAME: ESM CONSULTING ENGINEERS, LLC
ADDRESS: 33400 8TH AVE S, STE 205 FEDERAL WAY, WA 98003
PHONE: (800) 345-5644
CONTACT: ERIC LABRIE, A.I.C.P.

ENVIRONMENTAL CONSULTANT

NAME: TALASAEA CONSULTANTS, INC.
ADDRESS: 15020 BEAR CREEK RD. NE WOODINVILLE, WA 98077
PHONE: (425) 861-7550
CONTACT: OLIN ANDERSON, SENIOR LANDSCAPE PLANNER
DAVID TEESDALE, SENIOR WETLAND ECOLOGIST

GENERAL CONTRACTOR

NAME: CASCADE UTILITIES
ADDRESS: 7600 185TH AVE. NE REDMOND, WA 98052
PHONE: (425) 861-8787
CONTACT: ROBERT BAILIE

LANDSCAPE CONTRACTOR

NAME: G&F LANDSCAPE SERVICES
ADDRESS: 107 236TH STREET SE BOTHELL, WA 98021
PHONE: (425) 487-0486
CONTACT: GORDON WEGNER

SHEET INDEX

SHEET NUMBER	SHEET TITLE
W1.0	SITE OVERVIEW PLAN
W2.0	PLANTING PLAN
W2.1	PLANTING PLAN
W2.2	PLANTING PLAN, PLANT SCHEDULE, NOTES & DETAILS

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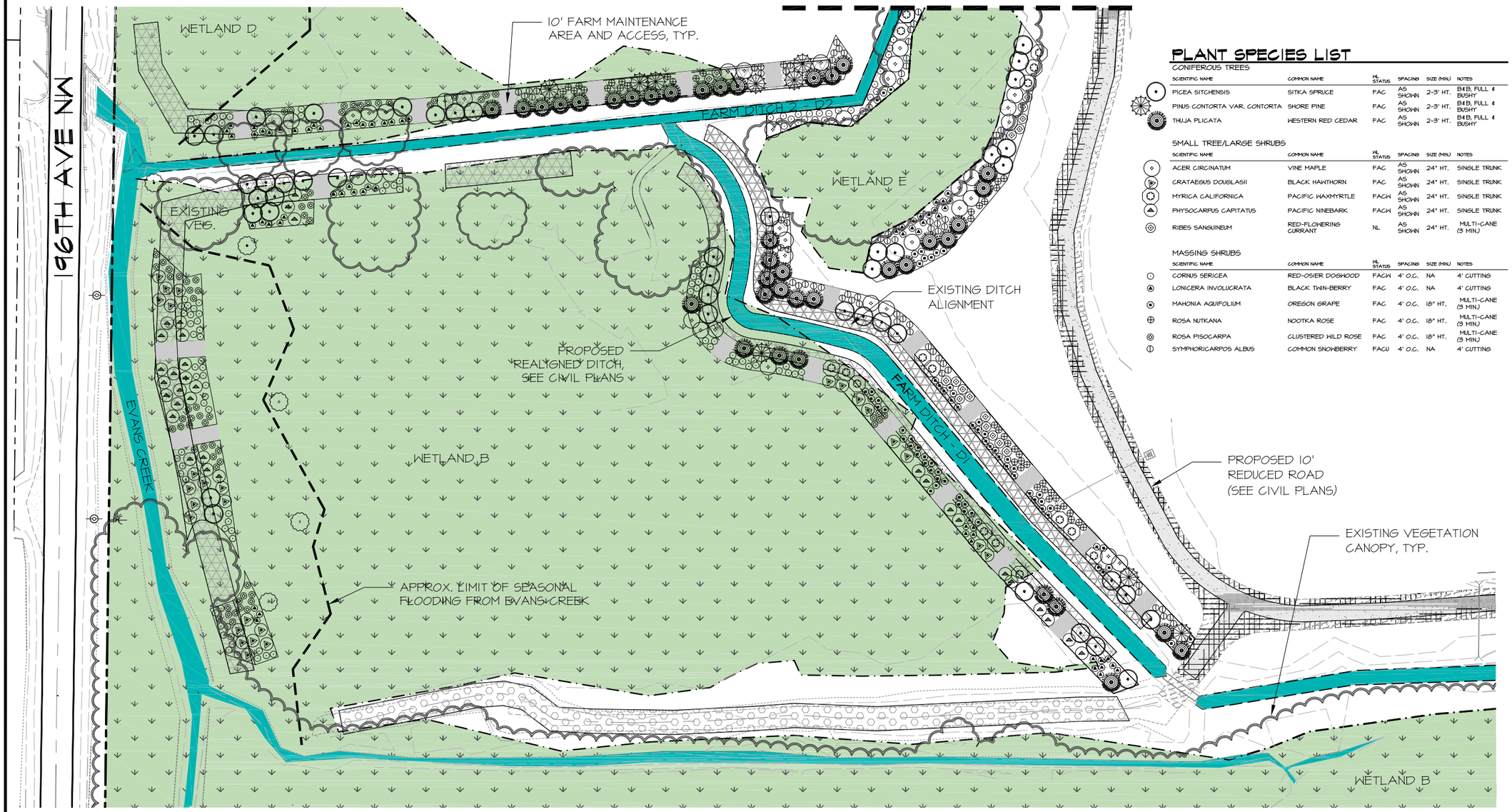
Plotted January 6, 2017



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0 15' 30' 60'
SCALE: 1"=30'

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15005 Bear Creek Road NE, Woodinville, Washington 98077
Phone (425) 861-1580 - Fax (425) 861-7540

PLANTING PLAN
PLANTING PLAN
GUNSHY MANOR FARM
REDMOND, WASHINGTON

Revisions	Date	By

Date 01-05-2017
Scale AS SHOWN
Designed OA/MN
Drawn OA/MN
Checked AO
Approved BS

Project # TAL-1147

Sheet # W2.0

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Plotted January 5, 2017

PLANT SPECIES LIST

CONIFEROUS TREES

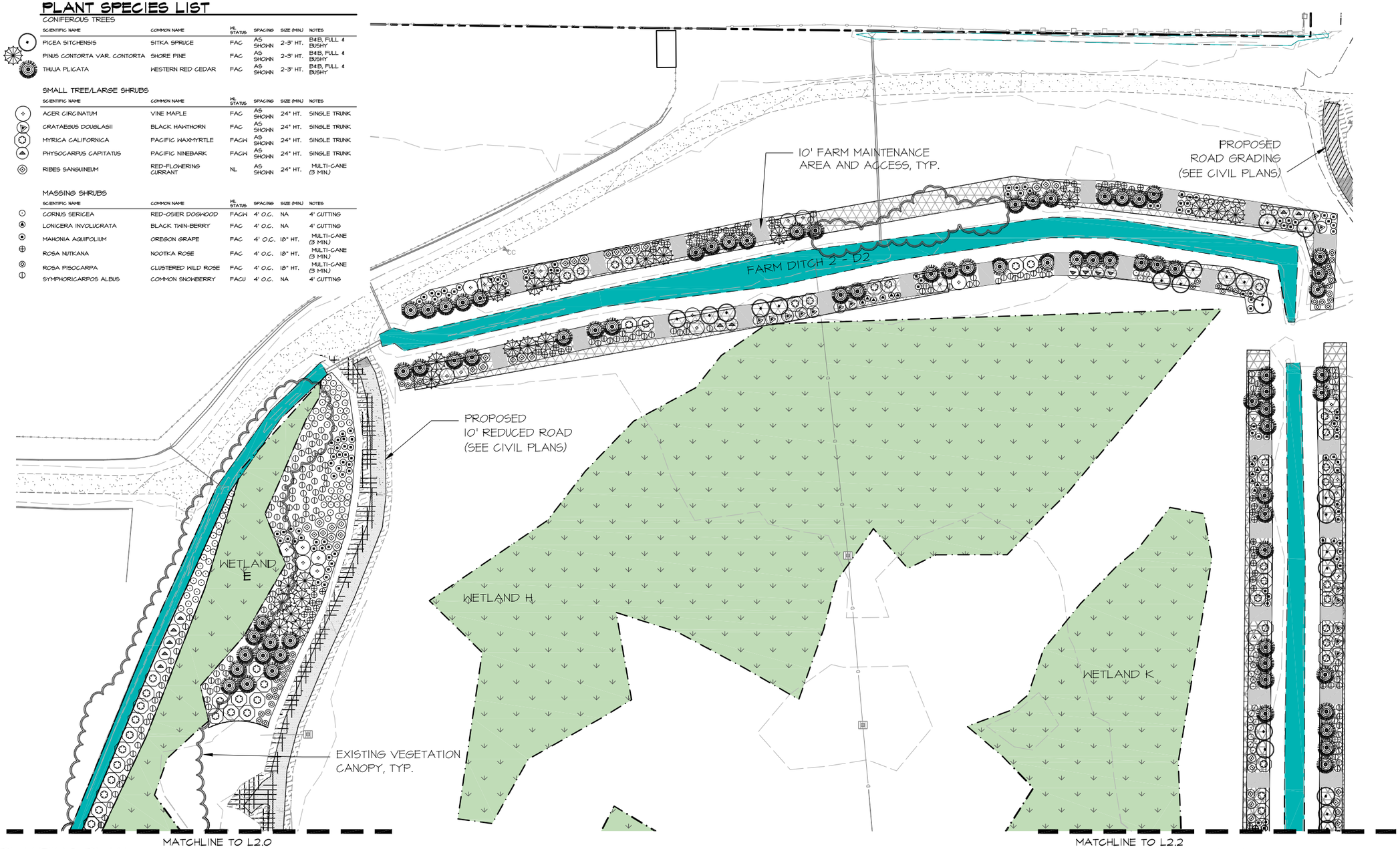
SCIENTIFIC NAME	COMMON NAME	WL STATUS	SPACING	SIZE (MIN.)	NOTES
PICEA SITCHENSIS	SITKA SPRUCE	FAC	AS SHOWN	2-3' HT.	B&B, FULL & BUSHY
PINUS CONTORTA VAR. CONTORTA	SHORE PINE	FAC	AS SHOWN	2-3' HT.	B&B, FULL & BUSHY
THUJA PLICATA	WESTERN RED CEDAR	FAC	AS SHOWN	2-3' HT.	B&B, FULL & BUSHY

SMALL TREE/LARGE SHRUBS

SCIENTIFIC NAME	COMMON NAME	WL STATUS	SPACING	SIZE (MIN.)	NOTES
ACER CIRCINATUM	VINE MAPLE	FAC	AS SHOWN	24" HT.	SINGLE TRUNK
CRATAEGUS DOUGLASII	BLACK HAWTHORN	FAC	AS SHOWN	24" HT.	SINGLE TRUNK
MYRICA CALIFORNICA	PACIFIC WAXMYRTLE	FACW	AS SHOWN	24" HT.	SINGLE TRUNK
PHYSOCARPUS CAPITATUS	PACIFIC NINEBARK	FACW	AS SHOWN	24" HT.	SINGLE TRUNK
RIBES SANGUINEUM	RED-FLOWERING CURRANT	NL	AS SHOWN	24" HT.	MULTI-CANE (3 MIN.)

MASSING SHRUBS

SCIENTIFIC NAME	COMMON NAME	WL STATUS	SPACING	SIZE (MIN.)	NOTES
CORNUS SERICEA	RED-OSIER DOGWOOD	FACW	4' O.C.	NA	4' CUTTING
LONICERA INVOLUCRATA	BLACK TWIN-BERRY	FAC	4' O.C.	NA	4' CUTTING
MAHONIA AQUIFOLIUM	OREGON GRAPE	FAC	4' O.C.	18" HT.	MULTI-CANE (3 MIN.)
ROSA NUTKANA	NOOTKA ROSE	FAC	4' O.C.	18" HT.	MULTI-CANE (3 MIN.)
ROSA PISOCARPA	CLUSTERED WILD ROSE	FAC	4' O.C.	18" HT.	MULTI-CANE (3 MIN.)
SYMPHORICARPOS ALBUS	COMMON SNOWBERRY	FACU	4' O.C.	NA	4' CUTTING



PLANTING PLAN

GRAPHIC SCALE (IN FEET)
0 15 30 60
SCALE: 1"=30'
NORTH

PLAN LEGEND

PROPERTY LINE
EXISTING WETLAND

NOTES

1. SURVEY AND SITE PLAN PROVIDED BY ESM CONSULTING ENGINEERS, LLC.
2. SOURCE DRAWING WAS MODIFIED BY TALASAEA CONSULTANTS FOR VISUAL ENHANCEMENT.
3. THIS DIAGRAM IS FOR GENERAL ORIENTATION PURPOSES AND DOES NOT REFLECT AN EPA APPROVED WETLAND DELINEATION OF THE GEOGRAPHIC EXTENT OF WATERS OF THE U.S.

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Resource & Environmental Planning
15000 Bear Creek Road Northeast - Woodinville, Washington 98077
Bus (425) 861-7560 - Fax (425) 861-7549

PLANTING PLAN
PLANTING PLAN
GUNSHY MANOR FARM
REDMOND, WASHINGTON

Revisions	Date	By

Date 01-05-2017
Scale AS SHOWN
Designed OA/MW
Drawn OA/MW
Checked AO
Approved BS

Project # TAL-1147

Sheet # W2.1

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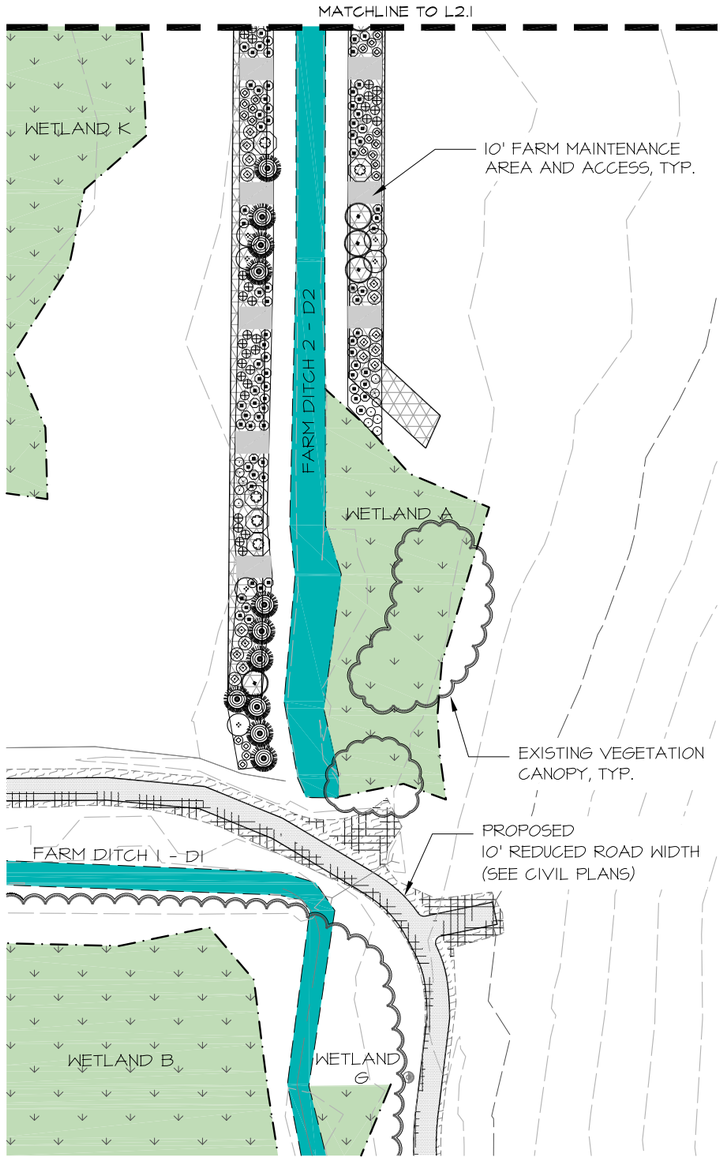
Plotted January 6, 2017



PLANTING PLAN

GRAPHIC SCALE (IN FEET)
0 15 30' 30'
SCALE: 1"=30'
NORTH

PLAN LEGEND

PROPERTY LINE
EXISTING WETLAND

PLANT SCHEDULE

CONIFEROUS TREES

SCIENTIFIC NAME	COMMON NAME	EPA QTY.	DOE QTY.	NL STATUS	SPACING	SIZE (MIN)	NOTES
PICEA SITCHENSIS	SITKA SPRUCE	57	13	FAC	AS SHOWN	2-3' HT.	B&B, FULL & BUSHY
PINUS CONTORTA VAR. CONTORTA	SHORE PINE	24	7	FAC	AS SHOWN	2-3' HT.	B&B, FULL & BUSHY
THUJA PLICATA	WESTERN RED CEDAR	103	18	FAC	AS SHOWN	2-3' HT.	B&B, FULL & BUSHY
	SUBTOTAL:	184	38				

SMALL TREE/LARGE SHRUB

SCIENTIFIC NAME	COMMON NAME	EPA QTY.	DOE QTY.	NL STATUS	SPACING	SIZE (MIN)	NOTES
ACER CIRCINATUM	VINE MAPLE	47	16	FAC	AS SHOWN	24" HT.	SINGLE TRUNK
CRATAEGUS DOUGLASII	BLACK HAWTHORN	33	8	FAC	AS SHOWN	24" HT.	SINGLE TRUNK
MYRICA CALIFORNICA	PACIFIC WAXMYRTLE	47	24	FACW	AS SHOWN	24" HT.	SINGLE TRUNK
PHYSOCARPUS CAPITATUS	PACIFIC NINEBARK	29	16	FACW	AS SHOWN	24" HT.	SINGLE TRUNK
RIBES SANGUINEUM	RED-FLOWERING CURRANT	54	14	NL	AS SHOWN	18" HT.	MULTI-CANE (3 MIN.)
	SUBTOTAL:	210	80				

MASSING SHRUB

SCIENTIFIC NAME	COMMON NAME	EPA QTY.	DOE QTY.	NL STATUS	SPACING	SIZE (MIN)	NOTES
CORNUS SERICEA	RED-OSIER DOGWOOD	94	131	FACW	4' O.C.	NA	4' CUTTING
LONICERA INVOLUCRATA	BLACK TWIN-BERRY	54	24	FAC	4' O.C.	NA	4' CUTTING
MAHONIA AQUIFOLIUM	OREGON GRAPE	220	50	FAC	4' O.C.	18" HT.	MULTI-CANE (3 MIN.)
ROSA NUTKANA	NOOTKA ROSE	117	17	FAC	4' O.C.	18" HT.	MULTI-CANE (3 MIN.)
ROSA PISOCARPA	CLUSTERED WILD ROSE	81	48	FAC	4' O.C.	18" HT.	MULTI-CANE (3 MIN.)
SYMPHORICARPOS ALBUS	COMMON SNOWBERRY	112	133	FACU	4' O.C.	NA	4' CUTTING
	SUBTOTAL:	678	403				

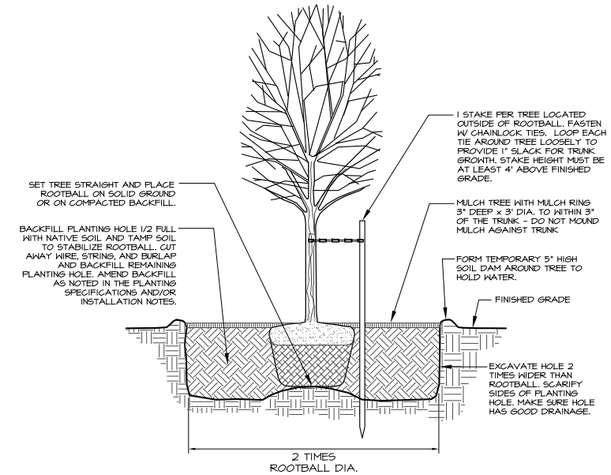
	EPA QTY.	DOE QTY.
TOTAL PLANTS:	1,072	521

GENERAL PLANT INSTALLATION NOTES

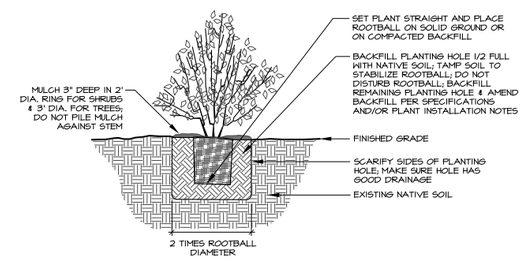
1. PLANT TREES AND/OR SHRUBS 1" HIGHER THAN DEPTH GROWN AT NURSERY.
2. FOR CONTAINER TREES AND/OR SHRUBS, SCORE FOUR SIDES OF ROOTBALL PRIOR TO PLANTING. BUTTERFLY ROOTBALL IF ROOT CIRCLING IS EVIDENT.
3. STAKE DECIDUOUS AND EVERGREEN TREES 4 FEET AND OVER IN HEIGHT WITH ONE (1) STAKE PER TREE. STAKE TREES IMMEDIATELY AFTER PLANTING. PLACE STAKE AT THE OUTER EDGE OF THE ROOTS OR ROOTBALL, IN LINE WITH THE PREVAILING WIND. STAKES SHALL BE LOOSELY ATTACHED USING CHAIN-LOCK TREE TIES TO ALLOW FOR SOME TRUNK MOVEMENT.
4. TREE STAKES TO BE VERTICAL, PARALLEL, EVEN-TOPPED, UNSCARRED AND DRIVEN INTO UNDISTURBED SUBGRADE. REMOVE AFTER ONE YEAR.
5. WATER PLANTS IMMEDIATELY UPON PLANTING, THEN PROVIDE MANUAL WATERING OR A TEMPORARY IRRIGATION SYSTEM, TO THE EXTENT NEEDED, IN ORDER TO PREVENT PLANT MORTALITY AND ENSURE PROPER PLANT ESTABLISHMENT. PLANTS SHALL RECEIVE A MINIMUM OF APPROXIMATELY ONE INCH OF WATER EVERY WEEK DURING THE DRY SEASON (GENERALLY JUNE 15TH - OCTOBER 15TH, OR EARLIER OR LATER IF CONDITIONS WARRANT) FOR THE FIRST SEASON AFTER PLANTING. IRRIGATION AMOUNTS MAY NEED TO BE INCREASED DURING PROLONGED PERIODS OF HOT, DRY WEATHER.
6. FERTILIZE ALL TREES AND SHRUBS WITH A SLOW-RELEASE GENERAL PURPOSE GRANULAR FERTILIZER OR SLOW-RELEASE TABLETS AT MANUFACTURER'S SPECIFIED RATE.
7. APPLY PLANT PROTECTION TUBES, OR SIMILAR DEVICES, ON EACH PLANT TO PROTECT FROM PREDATION BY SMALL MAMMALS.

PLANTING SEQUENCE

1. SITE PREPARATION FOR TREE AND SHRUB PLANTING WILL OCCUR FOLLOWING ANY PROPOSED GRADING OR OTHER MAJOR DISTURBANCES IN PLANTING AREAS.
2. CONTRACTOR TO COORDINATE WITH OWNER AND TALASAEA CONSULTANTS PRIOR TO BEGINNING WORK.
3. PLANTING SHALL BE SCHEDULED TO OCCUR IN THE FALL, WHEN CONDITIONS ARE FAVORABLE FOR NATIVE PLANT SURVIVAL.
4. SURVEY PLANTING AREAS AND MARK PERIMETERS WITH LATH STAKES.
5. PREPARE PLANTING AREAS BY REMOVING RUBBLE, TRASH, CONSTRUCTION DEBRIS, AND MOWING GRASSES AT LOWEST PRACTICAL SETTING.
6. FLAG OR MARK PLANT LOCATIONS ACCORDING TO PLAN, THEN HAVE PLANTING LAYOUT REVIEWED BY TALASAEA CONSULTANTS FOR ANY NECESSARY ADJUSTMENTS.
7. CLEAR PLANTING RING AND EXCAVATE HOLES FOR PLANTS WITH MECHANICAL AUGER, SKID-STEER MOUNTED AUGER, OR WITH HAND TOOLS. HOLES TO BE DUG TO DEPTH OF INSTALLED PLANT CONTAINER SIZE, AND 2.5 TIMES THE WIDTH OF PLANT CONTAINER SIZE.
8. IF NECESSARY, SOILS MAY NEED LOOSENING AND/OR AMENDING WITH COMPOST OR TOPSOIL.
9. PRE-WATER HOLES PRIOR TO PLANTING, IF CONDITIONS ARE DRY.
10. PLACE PLANTS PER GENERAL PLANT INSTALLATION NOTES.
11. PLACE MULCH IN RINGS AROUND PLANTS, AT A MINIMUM OF 24" DIAMETER AND 3" DEPTH.
12. TALASAEA CONSULTANTS SHALL INSPECT PLANTING TO ENSURE PROPER INSTALLATION, AND MAY DIRECT CHANGES AS NECESSARY.
13. INSTALL BEAVER FENCING (HOGWIRE OR SIMILAR) AS NEEDED AROUND PLANTING AREAS.
14. INSTALL TEMPORARY IRRIGATION SYSTEM, TO BE UTILIZED AT A MINIMUM OF ONE YEAR FOLLOWING PLANTING, AND PROVIDE WATER PER THE GENERAL PLANT INSTALLATION NOTES. IRRIGATION AMOUNTS AND FREQUENCY MAY BE MODIFIED UNDER APPROVAL FROM TALASAEA CONSULTANTS.
15. MAINTAIN SITE PER THE FINAL RESTORATION AND MITIGATION WORK PLAN, INCLUDING MAINTAINING GRASS BETWEEN PLANTS IN A MOWED OR TRIMMED CONDITION TO REDUCE PLANT COMPETITION.



1 B&B TREE PLANTING DETAIL.
NTS



2 CONTAINER STOCK PLANTING DETAIL
N.T.S.

NOTES

1. SURVEY AND SITE PLAN PROVIDED BY ESM CONSULTING ENGINEERS, LLC.
2. SOURCE DRAWING WAS MODIFIED BY TALASAEA CONSULTANTS FOR VISUAL ENHANCEMENT.
3. THIS DIAGRAM IS FOR GENERAL ORIENTATION PURPOSES AND DOES NOT REFLECT AN EPA APPROVED WETLAND DELINEATION OF THE GEOGRAPHIC EXTENT OF WATERS OF THE U.S.

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Resource & Environmental Planning
15400 Bear Creek Road Northeast - Woodinville, Washington 98077
Ph: (425) 485-7850 - Fax: (425) 485-7859

PLANTING PLAN
PLANTING PLAN, PLANT SCHEDULE, NOTES & DETAILS
GUNSHY MANOR FARM
REDMOND, WASHINGTON

Revisions	Date	By

Date	01-05-2017
Scale	AS SHOWN
Designed	OA/MW
Drawn	OA/MW
Checked	AO
Approved	BS

Project # TAL-1147

Sheet # W2.2

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G:\0000\1147 Gunshy Farm\Dwg\1147W2.1.dwg 2017-01-06 (with XREF)
Plotted January 6, 2017

Appendix B

Wetland Data Sheets

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

Project/Site: TAL-1147 Gunshy Manor City/County: King Sampling Date: 5-12-17

Applicant/Owner: Buff Nelson State: Washington Sampling Point: TPH-3

Investigator(s): DRT/JMM/BS Section, Township, Range: NW 1/4 Section 8, T25N, R6E

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

Subregion (LRR): A Lat: 47.6692 Long: -122.0735 Datum: NAD83

Soil Map Unit Name: Norma sandy loam NWI classification: None

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

Are Vegetation Yes, Soil Yes, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks: Hydric soils were not present, so this point was considered to be not within the wetland.

Data form originally sampled on 11-8-2016. Sampling data above reflects revised date of data collection. Site has been under farm management for decades. Farming and drainage is the "normal circumstances" for this Site. This sample point is located within a hay field that is actively managed for grass species through overseeding and mowing. This area is over fill.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *None*			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15ft)			
1. *None*			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5ft)			
1. *Agrostis capillaris*	30	Yes	FAC
2. *Geranium molle*	2	No	NI
3. *Festuca rubra*	30	Yes	FAC
4. *Bromus pacificus*	10	No	NI
5. *Festuca idahoensis*	20	Yes	FACU
6. *Prunella vulgaris*	5	No	FACU
7. *Vicia americana*			
8.			
	92	= Total Cover	
Woody Vine Stratum (Plot size: N/A)			
1. *None*			
2.			
	0	= Total Cover	

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

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

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

☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks:

SOIL

Sampling Point: TPH-3

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR 3/2	100					L	
7-14	10YR 4/1	100					SL	
14+	10YR 4/1	98	7.5YR 4/6	2	C	M	SL	

[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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1 (**except MLRA 1**))
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☒

Remarks: Plastic bag found at 14". Does not meet A12 because soil layers above the depleted matrix (14"+) are not 3/1 or less (the layers above the DM do not meet the requirements). No redox features present within soil profile in upper 14" so this pit does not meet F3 or F6, and even if the depleted matrix started at 12", the upper horizons would not meet the A11 requirements for layers above the depleted matrix with a value of 4 from 7-14". Soils within this portion of the field are erratic. There is old fill material around this area that does not react consistently. Soils and hydric soil indicators are erratic across this northwest portion of Thompson Field.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 7

Wetland Hydrology Present? Yes ☒ No ☐

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

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

Project/Site: TAL-1147 Gunshy Manor City/County: King Sampling Date: 5-10-17

Applicant/Owner: Buff Nelson State: Washington Sampling Point: TPH-4

Investigator(s): DRT/JMM/BS Section, Township, Range: NW 1/4 Section 8, T25N, R6E

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

Subregion (LRR): A Lat: 47.6692 Long: -122.0735 Datum: NAD83

Soil Map Unit Name: Norma sandy loam NWI classification: None

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

Are Vegetation Yes, Soil Yes, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ☒	No ☐
Hydric Soil Present?	Yes ☐	No ☒
Wetland Hydrology Present?	Yes ☐	No ☒

Is the Sampled Area within a Wetland? Yes ☐ No ☒

Remarks: This sample point is not located within the wetland as confirmed by the lack of hydrology and hydric soils.

Data form originally sampled on 11-8-2016. Sampling data above reflects revised date of data collection.

Site has been under farm management for decades. Farming and drainage is the "normal circumstances" for this Site. This sample point is located within a hay field that is actively managed for grass species through overseeding and mowing. This area is over fill.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *None*			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15ft)			
1. *None*			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5ft)			
1. *Prunella vulgaris*	10	No	FACU
2. *Geranium molle*	10	No	NI
3. *Agrostis capillaris*	20	Yes	FAC
4. *Festuca rubra*	20	Yes	FAC
5. *Poa pratensis*	20	Yes	FAC
6. *Bromus pacificus*	5	No	NI
7. *Ranunculus acris*	10	No	FAC
8. *Vicia americana*	2	No	FAC
	97	= Total Cover	
Woody Vine Stratum (Plot size: N/A)			
1. *None*			
2.			
	0	= Total Cover	

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

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: 67 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

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

☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks:

SOIL

Sampling Point: TPH-4

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-9	10YR 3/2	100					SL	
9-11	10YR 4/1	85	10YR 5/6	15	C	M	SL	
11-12	10YR 3/2	100					SL	

[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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1 (**except MLRA 1**))
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks: The depleted matrix is not thick enough for its location (6" starting within the upper 10"), and at only 2" thick it would need to start in the upper 6", which we're 3" away from. This could be an artifact of soil disturbance, but based on current conditions, no hydric soil indicators are met.

Soils within this portion of the field are erratic. There is old fill material around this area that does not react consistently. Soils and hydric soil indicators are erratic across this northwest portion of Thompson Field.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? **Yes** ☐ **No** ☒

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

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

Project/Site: TAL-1147 Gunshy Manor City/County: King Sampling Date: 5-12-17

Applicant/Owner: Buff Nelson State: Washington Sampling Point: TPH-5

Investigator(s): DRT/JMM/BS Section, Township, Range: NW 1/4 Section 8, T25N, R6E

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

Subregion (LRR): A Lat: 47.6692 Long: -122.0735 Datum: NAD83

Soil Map Unit Name: Norma sandy loam NWI classification: None

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

Are Vegetation Yes, Soil Yes, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks: This sample point is on the wetland line.

Data form originally sampled on 11-8-2016. Sampling data above reflects revised date of data collection. Site has been under farm management for decades. Farming and drainage is the "normal circumstances" for this Site. This sample point is located within a hay field that is actively managed for grass species through overseeding and mowing.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *None*			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15ft)			
1. *None*			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5ft)			
1. *Agrostis capillaris*	30	Yes	FAC
2. *Prunella vulgaris*	20	Yes	FACU
3. *Festuca rubra*	30	Yes	FAC
4. *Vicia americana*	20	Yes	FAC
5.			
6.			
7.			
8.			
	92	= Total Cover	
Woody Vine Stratum (Plot size: N/A)			
1. *None*			
2.			
	0	= Total Cover	

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

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

☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks:

SOIL

Sampling Point: TPH-5

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	100					L	
4-10	10YR 4/1	95	10YR 5/8	5	C	M	SL	

[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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1 (**except MLRA 1**))
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks: Soils within this portion of the field are erratic. There is old fill material around this area that does not react consistently. Soils and hydric soil indicators are erratic across this northwest portion of Thompson Field.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 10

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks: Wetland hydrology present as observed in November 2016 and May 2017.

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

Project/Site: TAL-1147 Gunshy Manor City/County: King Sampling Date: 11-8-2016

Applicant/Owner: Buff Nelson State: Washington Sampling Point: TPH-7

Investigator(s): DRT/JMM Section, Township, Range: NW 1/4 Section 8, T25N, R6E

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

Subregion (LRR): A Lat: 47.6692 Long: -122.0735 Datum: NAD83

Soil Map Unit Name: Norma sandy loam NWI classification: None

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

Are Vegetation Yes, Soil Yes, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks: Site has been under farm management for decades. Farming and drainage is the "normal circumstances" for this Site. This sample point is located within a hay field that is actively managed for grass species through overseeding and mowing. Area is over fill. This sample point is located within Wetland H. Soils are assumed hydric due to strong presence of wetland hydrology despite the soils.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *None*			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15ft)			
1. *None*			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5ft)			
1. *Grass species*	95	Yes	FAC
2. *Geranium molle*	2	No	NI
3. *Lactuca serriola*	3	No	FACU
4.			
5.			
6.			
7.			
8.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: N/A)			
1. *None*			
2.			
	0	= Total Cover	

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

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	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

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

☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes ☒ No ☐**

Remarks: Common grass species identified at other times of year within this area include Festuca rubra, Poa pratensis, Phalaris arundinacea, and Agrostis tenuis and capillaris. Grass species present at the time of sampling were unable to be identified to the specific level due to the lack of distinguishing characteristics. The grasses were assumed FAC for the dominance test to be conservative, especially given that the commonly occurring grass species previously identified are FAC or wetter.

SOIL

Sampling Point: TPH-7

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 3/2	100					L	
5-8	10YR 4/1	100					SL	

[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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1 (**except MLRA 1**))
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks: No hydric soil indicators met. Soils within this portion of the field are erratic. There is old fill material around this area that does not react consistently. Soils and hydric soil indicators are erratic across this northwest portion of Thompson Field. Hard pan layer at 8 inches. Impossible to dig hole any deeper with a shovel. Excavator was not used at this location despite lack of pit depth because we did not feel it would change the delineation. The strong presence of wetland hydrology indicates that hydric soils are likely present. Indicators A11 and/or A12 are possible indicators present at this SP, but due to the mechanical refusal, an indicator isn't proven. We erred on the cautious side.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 0

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

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

Project/Site: TAL-1147 Gunshy Manor City/County: King Sampling Date: 5-10-17

Applicant/Owner: Buff Nelson State: Washington Sampling Point: TPH-8

Investigator(s): DRT/JMM Section, Township, Range: NW 1/4 Section 8, T25N, R6E

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

Subregion (LRR): A Lat: 47.6692 Long: -122.0735 Datum: NAD83

Soil Map Unit Name: Norma sandy loam NWI classification: None

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

Are Vegetation Yes, Soil Yes, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks: This soil did not meet a hydric soil indicator as the matrix was not more than 60% of the profile - redox features were prolific, which tend to indicate something other than a fluctuating water table as the cause.

Data form originally sampled on 11-8-2016. Sampling data above reflects revised date of data collection. Site has been under farm management for decades. Farming and drainage is the "normal circumstances" for this Site. This sample point is located within a hay field that is actively managed for grass species through overseeding and mowing.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *None*			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15ft)			
1. *None*			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5ft)			
1. *Festuca rubra*	30	Yes	FAC
2. *Agrostis capillaris*	10	No	FAC
3. *Bromus pacificus*	10	No	NI
4. *Prunella vulgaris*	5	No	FACU
5. *Myosotis scorpioides*	5	No	FACW
6. *Vicia americana*	10	No	FAC
7. *Poa pratensis*	20	Yes	FAC
8.			
	90	= Total Cover	
Woody Vine Stratum (Plot size: N/A)			
1. *None*			
2.			
	0	= Total Cover	

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

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	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

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

☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks:

SOIL

Sampling Point: TPH-8

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	100					L	
4-10	10YR 4/1	50	10YR 5/6	50	C	M	SL	

[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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1 (**except MLRA 1**))
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks: Not hydric. Soil matrix is not more than 60% of soil composition. Mottling and redox features are so prolific that the matrix is reduced to less than 60% of the profile, which does not meet the F3 indicator.

Soils within this portion of the field are erratic. There is old fill material around this area that does not react consistently. Soils and hydric soil indicators are erratic across this northwest portion of Thompson Field.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 4

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

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

Project/Site: TAL-1147 Gunshy Manor City/County: King Sampling Date: 05-10-17

Applicant/Owner: Buff Nelson State: Washington Sampling Point: TPH-9

Investigator(s): DRT/JMM Section, Township, Range: NW 1/4 Section 8, T25N, R6E

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

Subregion (LRR): A Lat: 47.6692 Long: -122.0735 Datum: NAD83

Soil Map Unit Name: Norma sandy loam NWI classification: None

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

Are Vegetation Yes, Soil Yes, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks: Sample point is within Wetland H. This point was considered to be a wetland despite the lack of a hydric soil indicator. An exact delineation within this field is almost impossible given the disturbed nature of this area, so best professional judgment was used. This location does not appear consistent with the surrounding areas and thus was considered an anomoly and not indicative of wetland conditions within Wetland H.

Data form originally sampled on 11-14-2016. Sampling data above reflects revised date of data collection.

Site has been under farm management for decades. Farming and drainage is the "normal circumstances" for this Site. This sample point is located within a hay field that is actively managed for grass species through overseeding and mowing. This area is over old fill.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *None*			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15ft)			
1. *None*			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5ft)			
1. *Bromus pacificus*	10	No	NI
2. *Festuca rubra*	35	Yes	FAC
3. *Agrostis tenuis*	35	Yes	NI
4. *Poa pratensis*	20	Yes	FAC
5.			
6.			
7.			
8.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: N/A)			
1. *None*			
2.			
	0	= Total Cover	

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

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

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

☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

SOIL

Sampling Point: TPH-9

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 4/2	100					SL	
4-9	10YR 4/1	100					SL	

[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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1 (**except MLRA 1**))
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☒

Remarks: Hole depth is 9 inches. Dense gravelly sand horizon boundary. No hydric soil indicators met. Soils within this portion of the field are erratic. There is old fill material around this area that does not react consistently. Soils and hydric soil indicators are erratic across this northwest portion of Thompson Field. Despite the presence of active wetland hydrology, no redox features have developed at this location.

Later soil work using an excavator confirmed the disturbed nature of these soils. A mix of dense material and rubble occur at 20+" below the soil surface which often prevented the excavator from getting below 20-24" in several situations in this general area.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☒ No ☐ Depth (inches): 1

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 0

Wetland Hydrology Present? Yes ☒ No ☐

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

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

Project/Site: TAL-1147 Gunshy Manor City/County: King Sampling Date: 05-10-17

Applicant/Owner: Buff Nelson State: Washington Sampling Point: TPH-10

Investigator(s): JMM/DRT Section, Township, Range: NW 1/4 Section 8, T25N, R6E

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

Subregion (LRR): A Lat: 47.6692 Long: -122.0735 Datum: NAD83

Soil Map Unit Name: Norma sandy loam NWI classification: None

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

Are Vegetation Yes, Soil Yes, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks: Sample point along western edge of Wetland H.

Data form originally sampled on 11-14-2016. Sampling data above reflects revised date of data collection. Site has been under farm management for decades. Farming and drainage is the "normal circumstances" for this Site. This sample point is located within a hay field that is actively managed for grass species through overseeding and mowing.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *None*			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15ft)			
1. *None*			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5ft)			
1. *Cerastium glomeratum*	10	No	FACU
2. *Festuca rubra*	30	Yes	FAC
3. *Agrostis capillaris*	30	Yes	FAC
4. *Poa pratensis*	25	Yes	FAC
5. *Ranunculus acris*	5	No	FAC
6.			
7.			
8.			
	70	= Total Cover	
Woody Vine Stratum (Plot size: N/A)			
1. *None*			
2.			
	0	= Total Cover	

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

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 _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

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

☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks:

SOIL

Sampling Point: TPH-10

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR 3/2	100					GSiL	
7-11	10YR 4/1	98	10YR 4/6	2	C	M	GSL	
11-16	10YR 3/1	100					SL	
16-20	10YR 3/2	100					LS	
20+	GLEY N 4/1	100					S	

[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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1 (**except MLRA 1**))
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: dense soil layer

Depth (inches): @9"

Hydric Soil Present? Yes ☒ No ☐

Remarks: Soil conditions very wet due to surface ponding and shallow aquitard - technically the layer of the depleted matrix would require at least 4" of thickness where it occurs below 6" but within 10", however, the depleted matrix ended at a very dense soil layer that was impossible to dig through with hand tools. So, given the presence of wetland hydrology, we assumed a positive hydric soil indicator as the depth of the depleted matrix was the only point where this profile did not meet an indicator.

Soils within this portion of the field are erratic. There is old fill material around this area that does not react consistently. Soils and hydric soil indicators are erratic across this northwest portion of Thompson Field.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 4

Wetland Hydrology Present? Yes ☒ No ☐

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

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

Project/Site: TAL-1147 Gunshy Manor City/County: King Sampling Date: 05-10-17

Applicant/Owner: Buff Nelson State: Washington Sampling Point: TPH-10A

Investigator(s): DRT/JMM Section, Township, Range: NW 1/4 Section 8, T25N, R6E

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

Subregion (LRR): A Lat: 47.6692 Long: -122.0735 Datum: NAD83

Soil Map Unit Name: Norma sandy loam NWI classification: None

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

Are Vegetation Yes, Soil Yes, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks: Sample point taken just outside of west edge of Wetland H. This sample point is ultimately inconclusive as to whether it should be in or out of the wetland because of the highly disturbed soil profile, and should not be used to consider wetland boundaries.

Data form originally sampled on 11-14-2016. Sampling data above reflects revised date of data collection. Site has been under farm management for decades. Farming and drainage is the "normal circumstances" for this Site. This sample point is located within a hay field that is actively managed for grass species through overseeding and mowing.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *None*			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15ft)			
1. *None*			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5ft)			
1. *Festuca rubra*	35	Yes	FAC
2. *Geranium molle*	5	No	NI
3. *Vicia americana*	5	No	FAC
4. *Agrostis capillaris*	35	Yes	FAC
5. *Poa pratensis*	20	Yes	FAC
6.			
7.			
8.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: N/A)			
1. *None*			
2.			
	0	= Total Cover	

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

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 _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

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

☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks:

SOIL

Sampling Point: TPH-10A

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 3/2	100					SiL	
5-8	GLEY N 5/	50	10YR 5/8	30	C	M	GSL	
	GLEY 10Y 5/1	20					GSL	
8-12	10YR 5/2	100					SiL	
12-26	10YR 4/1	100					GSiL	

[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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1 (**except MLRA 1**))
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks: This was an atypical soil profile that did not match the other area test pits dug. This test pit could be interpreted as maybe meeting, maybe not meeting F2. Generally the matrix is a gleyed color (though the colors are distinctly split) with a large amount of redox features present. However, since this layering was not found elsewhere, it makes one think this may be part of fill material brought in and not necessarily an in-situ condition. This was also a discontinuous layer, even in this immediately area.

Soils within this portion of the field are erratic. There is old fill material around this area that does not react consistently. Soils and hydric soil indicators are erratic across this northwest portion of Thompson Field. Work with an excavator confirmed these layers at depth, but even within the pit, these layers were inconsistently present - not continuous bands, reinforcing the disturbed nature of the soils at this particular location.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 8

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

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

Project/Site: TAL-1147 Gunshy Manor City/County: King Sampling Date: 05-10-17

Applicant/Owner: Buff Nelson State: Washington Sampling Point: TPH-11

Investigator(s): DRT/JMM Section, Township, Range: NW 1/4 Section 8, T25N, R6E

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

Subregion (LRR): A Lat: 47.6692 Long: -122.0735 Datum: NAD83

Soil Map Unit Name: Norma sandy loam NWI classification: None

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

Are Vegetation Yes, Soil Yes, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks: Site has been under farm management for decades. Farming and drainage is the "normal circumstances" for this Site. This sample point is located within a hay field that is actively managed for grass species through overseeding and mowing.

Sample point in the west corner of Wetland H.

Data form originally sampled on 11-14-2016. Sampling data above reflects revised date of data collection.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *None*			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15ft)			
1. *None*			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5ft)			
1. *Alopecurus geniculatus*	30	Yes	OBL
2. *Geranium molle*	2	No	NI
3. *Festuca rubra*	30	Yes	FAC
4. *Agrostis capillaris*	30	Yes	FAC
5. *Ranunculus acris*	2	No	FAC
6.			
7.			
8.			
	94	= Total Cover	
Woody Vine Stratum (Plot size: N/A)			
1. *None*			
2.			
	0	= Total Cover	

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

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 _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

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

☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks:

SOIL

Sampling Point: TPH-11

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR 4/2	100					SL	
7-11	10YR 4/1	98	10YR 5/6	2	C	M	GSL	

[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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1 (**except MLRA 1**))
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☒ No ☐ Depth (inches): 6

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 0

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks:

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

Project/Site: TAL-1147 Gunshy Manor City/County: King Sampling Date: 5-10-17

Applicant/Owner: Buff Nelson State: Washington Sampling Point: TPH-12

Investigator(s): DRT/JMM Section, Township, Range: NW 1/4 Section 8, T25N, R6E

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

Subregion (LRR): A Lat: 47.6692 Long: -122.0735 Datum: NAD83

Soil Map Unit Name: Norma sandy loam NWI classification: None

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

Are Vegetation Yes, Soil Yes, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ☒	No ☐
Hydric Soil Present?	Yes ☐	No ☒
Wetland Hydrology Present?	Yes ☐	No ☒

Is the Sampled Area within a Wetland? Yes ☐ No ☒

Remarks: Site has been under farm management for decades. Farming and drainage is the "normal circumstances" for this Site. This sample point is located within a hay field that is actively managed for grass species through overseeding and mowing. Sample point taken outside of Wetland H in the western edge. No hydric soils were present and conditions were good to clearly see redox features had they been present.

Data form originally sampled on 11-14-2016. Sampling data reflects revised date of data collection.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *None*			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15ft)			
1. *None*			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5ft)			
1. *Festuca rubra*	20	Yes	FAC
2. *Agrostis capillaris*	30	Yes	FAC
3. *Poa pratensis*	25	Yes	FAC
4. *Prunella vulgaris*	3	No	FACU
5. *Taraxacum officinale*	3	No	FACU
6. *Myosotis scorpioides*	3	No	FACW
7. *Geranium molle*	5	No	NI
8. *Vicia americana*	2	No	FAC
	91	= Total Cover	
Woody Vine Stratum (Plot size: N/A)			
1. *None*			
2.			
	0	= Total Cover	

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

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	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

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

☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks:

SOIL

Sampling Point: TPH-12

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 4/1	100					SL	
6-8	10YR 4/2	100					SL	

[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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1 (**except MLRA 1**))
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks: No redox features present within the soil profile. Mechanical refusal at 8". Excavator was not used at this location despite lack of pit depth.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? **Yes** ☐ **No** ☒

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

Remarks:

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

Project/Site: TAL-1147 Gunshy Manor City/County: King Sampling Date: 05-10-17

Applicant/Owner: Buff Nelson State: Washington Sampling Point: TPH-13

Investigator(s): JMM/KN/JSM Section, Township, Range: NW 1/4 Section 8, T25N, R6E

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

Subregion (LRR): A Lat: 47.6692 Long: -122.0735 Datum: NAD83

Soil Map Unit Name: Norma sandy loam NWI classification: None

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

Are Vegetation Yes, Soil Yes, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks: Site has been under farm management for decades. Farming and drainage is the "normal circumstances" for this Site. This sample point is located within a hay field that is actively managed for grass species through overseeding and mowing.

Sample point located in Wetland H. Sample points 13, 14 and 15 are sample points lacking clear hydric soil indicators that were used to adjust the delineation of Wetland H in this general area. Soils are assumed hydric due to strong presence of wetland hydrology despite the soils.

Data form originally sampled on 11-14-2016. Sampling data above reflects revised date of data collection.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *None*			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15ft)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5ft)			
1. *Alopecurus geniculatus*	30	Yes	OBL
2. *Festuca rubra*	30	Yes	FAC
3. *Agrostis capillaris*	30	Yes	FAC
4. *Myosotis scorpioides*	1	No	FACW
5. *Stellaria crispa*	1	No	FAC
6. *Lotus corniculatus*	3	No	FAC
7.			
8.			
	95	= Total Cover	
Woody Vine Stratum (Plot size: N/A)			
1. *None*			
2.			
	0	= 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: 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		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

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

☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks:

SOIL

Sampling Point: TPH-13

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

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

[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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1 (**except MLRA 1**))
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks: No redox features present. Mechanical refusal with shovel at 10". Excavator not used at this location despite lack of pit depth because we don't feel it would have changed the outcome of the delineation. The strong presence of wetland hydrology indicates that hydric soils are likely present. Indicators A11 and/or A12 are possible indicators present at this SP, but due to the mechanical refusal, an indicator isn't proven. We erred on the cautious side.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☒ No ☐ Depth (inches): 2

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 1

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks:

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

Project/Site: TAL-1147 Gunshy Manor City/County: King Sampling Date: 05-10-17

Applicant/Owner: Buff Nelson State: Washington Sampling Point: TPH-14

Investigator(s): JMM/KN/JSM Section, Township, Range: NW 1/4 Section 8, T25N, R6E

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

Subregion (LRR): A Lat: 47.6692 Long: -122.0735 Datum: NAD83

Soil Map Unit Name: Norma sandy loam NWI classification: None

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

Are Vegetation Yes, Soil Yes, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks: Site has been under farm management for decades. Farming and drainage is the "normal circumstances" for this Site. This sample point is located within a hay field that is actively managed for grass species through overseeding and mowing.

Sample point located in Wetland H. Sample points 13, 14 and 15 are sample points lacking clear hydric soil indicators that were used to adjust the delineation of Wetland H in this general area. Soils are assumed hydric due to strong presence of wetland hydrology despite the soils.

Data form originally sampled on 11-14-2016. Sampling data above reflects revised date of data collection.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *None*			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15ft)			
1. *None*			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5ft)			
1. *Festuca rubra*	25	Yes	FAC
2. *Agrostis capillaris*	25	Yes	FAC
3. *Alopecurus geniculatus*	30	Yes	OBL
4. *Geranium molle*	2	No	NI
5. *Prunella vulgaris*	2	No	FACU
6. *Ranunculus acris*	2	No	FAC
7. *Myosotis scorpioides*	10	No	FACW
8.			
	96	= Total Cover	
Woody Vine Stratum (Plot size: N/A)			
1. *None*			
2.			
	0	= Total Cover	

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

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		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

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

☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks:

SOIL

Sampling Point: TPH-14

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 3/2	100					SL	

[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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1 (**except MLRA 1**))
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks: Hard layer at 5 inches. Impossible to dig hole any deeper with a shovel. Excavator was not used at this location despite lack of pit depth because we did not feel it would change the delineation. The strong presence of wetland hydrology indicates that hydric soils are likely present. Indicators A11 and/or A12 are possible indicators present at this SP, but due to the mechanical refusal, an indicator isn't proven. We erred on the cautious side.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☒ No ☐ Depth (inches): 1

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 1

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks: Soils were saturated to within 1" of the soil surface.

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

Project/Site: TAL-1147 Gunshy Manor City/County: King Sampling Date: 5-10-17

Applicant/Owner: Buff Nelson State: Washington Sampling Point: TPH-15

Investigator(s): JMM/KN/JSM Section, Township, Range: NW 1/4 Section 8, T25N, R6E

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

Subregion (LRR): A Lat: 47.6692 Long: -122.0735 Datum: NAD83

Soil Map Unit Name: Norma sandy loam NWI classification: None

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

Are Vegetation Yes, Soil Yes, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks: Site has been under farm management for decades. Farming and drainage is the "normal circumstances" for this Site. This sample point is located within a hay field that is actively managed for grass species through overseeding and mowing. Sample point located in Wetland H. Sample points 13, 14 and 15 are sample points lacking clear hydric soil indicators that were used to adjust the delineation of Wetland H in this general area. Soils are assumed hydric due to strong presence of wetland hydrology despite the soils.

Data form originally sampled on 11-14-2016. Sampling data above reflects revised date of data collection.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *None*			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15ft)			
1. *None*			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5ft)			
1. *Alopecurus geniculatus*	20	Yes	OBL
2. *Festuca rubra*	30	Yes	FAC
3. *Agrostis tenuis*	30	Yes	NI
4. *Vicis americana*	2	No	FAC
5. *Lotus corniculatus*	2	No	FAC
6. *Prunella vulgaris*	10	No	FACU
7.			
8.			
	94	= Total Cover	
Woody Vine Stratum (Plot size: N/A)			
1. *None*			
2.			
	0	= Total Cover	

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

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

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

☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks:

SOIL

Sampling Point: TPH-15

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-5	10 YR 3/2	100					SL	
5-12	10 YR 5/2	100					GSL	
12+								Mechanical failure

[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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1 (**except MLRA 1**))
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks: No redox features present. Hard pan layer at 12 inches. Impossible to dig hole any deeper with a shovel. Excavator was not used at this location despite lack of pit depth because we did not feel it would change the delineation, particularly given the presence of the constructed rock-lined swale immediately south of this sample point. The strong presence of wetland hydrology indicates that hydric soils are likely present.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 2

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks: Soil saturated to within 2" of the soil surface.

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

Project/Site: TAL-1147 Gunshy Manor City/County: King Sampling Date: 05-10-17

Applicant/Owner: Buff Nelson State: Washington Sampling Point: TPI-3

Investigator(s): DRT/JMM Section, Township, Range: NW 1/4 Section 8, T25N, R6E

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

Subregion (LRR): A Lat: 47.6692 Long: -122.0735 Datum: NAD83

Soil Map Unit Name: Norma sandy loam NWI classification: None

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

Are Vegetation Yes, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks: Site has been under farm management for decades. Farming and drainage is the "normal circumstances" for this Site. This sample point is located within a hay field that is actively managed for grass species through overseeding and mowing. Sample point collected in western corner of Wetland I. This sample point was collected to provide a better representation than the previously collected sample points I-1 and I-2 (paired with I-4 and I-3, respectively).

Data form originally sampled on 11-14-2016. Sampling data above reflects revised date of data collection.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *None*			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15ft)			
1. *None*			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5ft)			
1. *Alopecurus pratensis*	15	No	FAC
2. *Festuca rubra*	30	Yes	FAC
3. *Agrostis capillaris*	30	Yes	FAC
4. *Vicia americana*	2	No	FAC
5. *Ranunculus repens*	2	No	FAC
6. *Poa pratensis*	20	Yes	FAC
7.			
8.			
	99	= Total Cover	
Woody Vine Stratum (Plot size: N/A)			
1. *None*			
2.			
	0	= Total Cover	

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

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	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

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

☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks:

SOIL

Sampling Point: TPI-3

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 4/2	100					SL	
5-10	10YR 4/1	90	10YR 5/8	10	C	M	GSL	

[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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1 (**except MLRA 1**))
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes ☐	No ☒	Depth (inches): _____
Water Table Present?	Yes ☒	No ☐	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes ☒	No ☐	Depth (inches): 0

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks:

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

Project/Site: TAL-1147 Gunshy Manor City/County: King Sampling Date: 05-10-17

Applicant/Owner: Buff Nelson State: Washington Sampling Point: TPI-4

Investigator(s): DRT/JMM Section, Township, Range: NW 1/4 Section 8, T25N, R6E

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

Subregion (LRR): A Lat: 47.6692 Long: -122.0735 Datum: NAD83

Soil Map Unit Name: Norma sandy loam NWI classification: None

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

Are Vegetation Yes, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks: Site has been under farm management for decades. Farming and drainage is the "normal circumstances" for this Site. This sample point is located within a hay field that is actively managed for grass species through overseeding and mowing. Upland point located to the south of Wetland I. This sample point was collected to provide a better representation than the previously collected sample points I-1 and I-2 (paired with I-4 and I-3, respectively).

Data form originally sampled on 11-14-2016. Sampling data above reflects revised date of data collection.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *None*			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15ft)			
1. *None*			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5ft)			
1. *Alopecurus geniculatus*	30	Yes	OBL
2. *Festuca rubra*	25	Yes	FAC
3. *Agrostis capillaris*	25	Yes	FAC
4. *Poa pratensis*	10	No	FAC
5. *Ranunculus acris*	1	No	FAC
6. *Geranium molle*	1	No	NI
7. *Trifolium repens*	5	No	FAC
8.			
	97	= Total Cover	
Woody Vine Stratum (Plot size: N/A)			
1. *None*			
2.			
	0	= Total Cover	

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

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	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

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

☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks:

SOIL

Sampling Point: TPI-4

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 4/2	100					SL	
4-15	10YR 4/1	100					GSL	

[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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1 (**except MLRA 1**))
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks: redoximorphic features were lacking within this soil profile.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? **Yes** ☐ **No** ☒

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

Remarks:

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

Project/Site: TAL-1147 Gunshy Manor City/County: King Sampling Date: 05-10-17

Applicant/Owner: Buff Nelson State: Washington Sampling Point: TPI-5

Investigator(s): JMM/KN/JSM Section, Township, Range: NW 1/4 Section 8, T25N, R6E

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

Subregion (LRR): A Lat: 47.6692 Long: -122.0735 Datum: NAD83

Soil Map Unit Name: Seattle muck NWI classification: None

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

Are Vegetation Yes, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks: Site has been under farm management for decades. Farming and drainage is the "normal circumstances" for this Site. This sample point is located within a hay field that is actively managed for grass species through overseeding and mowing. Upland point located south of Wetland I.

Data form originally sampled on 11-14-2016. Sampling data above reflects revised date of data collection.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *None*			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15ft)			
1. *None*			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5ft)			
1. *Festuca rubra*	15	Yes	FAC
2. *Agrostis capillaris*	10	No	FAC
3. *Poa pratensis*	15	Yes	FAC
4. *Schedonorus arundinaceus*	15	Yes	FAC
5. *Vicia americana*	10	No	FAC
6. *Taraxacum officinale*	20	Yes	FACU
7. *Lotus corniculatus*	2	No	FAC
8. *Phalaris arundinacea*	2	No	FAC
	89	= Total Cover	
Woody Vine Stratum (Plot size: N/A)			
1. *None*			
2.			
	0	= Total Cover	

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

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

☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks:

SOIL

Sampling Point: TPI-5

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

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

[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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1 (**except MLRA 1**))
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks: No redox features were present within this soil profile.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? **Yes** ☐ **No** ☒

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

Remarks:

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

Project/Site: TAL-1147 Gunshy Manor City/County: King Sampling Date: 05-10-17

Applicant/Owner: Buff Nelson State: Washington Sampling Point: TPI-7

Investigator(s): DRT/JMM Section, Township, Range: NW 1/4 Section 8, T25N, R6E

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

Subregion (LRR): A Lat: 47.6692 Long: -122.0735 Datum: NAD83

Soil Map Unit Name: Seattle muck NWI classification: None

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

Are Vegetation Yes, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ☒	No ☐
Hydric Soil Present?	Yes ☐	No ☒
Wetland Hydrology Present?	Yes ☐	No ☒

Is the Sampled Area within a Wetland? Yes ☐ No ☒

Remarks: Site has been under farm management for decades. Farming and drainage is the "normal circumstances" for this Site. This sample point is located within a hay field that is actively managed for grass species through overseeding and mowing. Upland point collected to the south of Wetland I.

Data form originally sampled on 11-14-2016. Sampling data above reflects revised date of data collection.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *None*			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15ft)			
1. *None*			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5ft)			
1. *Poa pratensis*	20	Yes	FAC
2. *Vicia americana*	50	Yes	FAC
3. *Phalaris arundinacea*	5	No	FACW
4. *Festuca rubra*	20	Yes	FAC
5.			
6.			
7.			
8.			
	95	= Total Cover	
Woody Vine Stratum (Plot size: N/A)			
1. *None*			
2.			
	0	= Total Cover	

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

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 _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

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

☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks:

SOIL

Sampling Point: TPI-7

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	100					SL	
4-11	10YR 4/1	100					GSL	
11-18	10YR 4/1	95	10YR 5/8	5	C	M	GSL	

[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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1 (**except MLRA 1**))
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks: Redox features begin below 10". This could be an artifact of plowing or other land management activities. A11 would not fit as the layer immediately above the depleted matrix has a value greater than 3.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? **Yes** ☐ **No** ☒

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

Remarks:

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

Project/Site: TAL-1147 Gunshy Manor City/County: King Sampling Date: 05-10-17

Applicant/Owner: Buff Nelson State: Washington Sampling Point: TPI-8

Investigator(s): JMM/KN/JSM Section, Township, Range: NW 1/4 Section 8, T25N, R6E

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

Subregion (LRR): A Lat: 47.6692 Long: -122.0735 Datum: NAD83

Soil Map Unit Name: Seattle muck NWI classification: None

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

Are Vegetation Yes, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ☒	No ☐
Hydric Soil Present?	Yes ☐	No ☒
Wetland Hydrology Present?	Yes ☐	No ☒

Is the Sampled Area within a Wetland? Yes ☐ No ☒

Remarks: Site has been under farm management for decades. Farming and drainage is the "normal circumstances" for this Site. This sample point is located within a hay field that is actively managed for grass species through overseeding and mowing. Upland plot located southeast of Wetland I.

Data form originally sampled on 11-14-2016. Sampling data above reflects revised date of data collection.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *None*			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15ft)			
1. *None*			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5ft)			
1. *Phalaris arundinacea*	50	Yes	FACW
2. *Festuca rubra*	15	No	FAC
3. *Agrostis tenuis*	15	No	NI
4. *Vicia americana*	20	Yes	FAC
5.			
6.			
7.			
8.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: N/A)			
1. *None*			
2.			
	0	= Total Cover	

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

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 _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks:

SOIL

Sampling Point: TPI-8

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	100					SL	
4-14	10YR 4/1	100					SL	

[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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1 (**except MLRA 1**))
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks: Wood material located at 6-8 inches. Large rocks present. No redox features present.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? **Yes** ☐ **No** ☒

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

Remarks:

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

Project/Site: TAL-1147 Gunshy Manor City/County: King Sampling Date: 05-10-17

Applicant/Owner: Buff Nelson State: Washington Sampling Point: TPI-9

Investigator(s): JMM/KN/JSM Section, Township, Range: NW 1/4 Section 8, T25N, R6E

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

Subregion (LRR): A Lat: 47.6692 Long: -122.0735 Datum: NAD83

Soil Map Unit Name: _____ NWI classification: None

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

Are Vegetation Yes, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks: Site has been under farm management for decades. Farming and drainage is the "normal circumstances" for this Site. This sample point is located within a hay field that is actively managed for grass species through overseeding and mowing. Wetland sample point in the middle of Wetland I. Considered a wetland point despite lack of hydric soils - see note on next page.

Data form originally sampled on 11-14-2016. Sampling data above reflects revised date of data collection.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *None*			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15ft)			
1. *None*			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5ft)			
1. *Alopecurus pratensis*	20	Yes	FAC
2. *Festuca rubra*	30	Yes	FAC
3. *Vicia americana*	10	No	FAC
4. *Agrostis capillaris*	30	Yes	FAC
5. *Poa pratensis*	10	No	FAC
6.			
7.			
8.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: N/A)			
1. *None*			
2.			
	0	= Total Cover	

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

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 _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

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

☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks:

SOIL

Sampling Point: TPI-9

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 3/2	100					SL	
3-13	GLEY 10Y 5/1	30	10YR 5/4	20	C	M	SL	
	10YR 5/1	50					SL	

[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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1 (**except MLRA 1**))
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks: This soil does not technically meet a hydric soil indicator - neither the 10Y nor the 10YR matrix meet the required 60% minimum as required for any of the F indicators that could be applicable (F2, F6) or for any other indicator with redox features present. However, when we combine these 2 matrices, we the soil pit would meet the F3 depleted matrix indicator. We checked yes on a hydric soil present due to our combining layers to meet an indicator, especially given the disturbed nature of the Site and the presence of wetland hydrology and vegetation. Excavator was not used at this location despite lack of pit depth because we did not feel it would change the delineation.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☒ No ☐ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 0

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

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

Project/Site: TAL-1147 Gunshy Manor City/County: King Sampling Date: 05-10-17

Applicant/Owner: Buff Nelson State: Washington Sampling Point: TPI-10

Investigator(s): JMM/KN/JSM Section, Township, Range: NW 1/4 Section 8, T25N, R6E

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

Subregion (LRR): A Lat: 47.6692 Long: -122.0735 Datum: NAD83

Soil Map Unit Name: Seattle Muck NWI classification: None

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

Are Vegetation Yes, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks: Site has been under farm management for decades. Farming and drainage is the "normal circumstances" for this Site. This sample point is located within a hay field that is actively managed for grass species through overseeding and mowing. Wetland data point taken on east side on Wetland I. This sample point was considered to be a wetland point despite the lack of a clear hydric soil indicator. This sample point reflects the disturbed nature of this field.

Data form originally sampled on 11-14-2016. Sampling data above reflects revised date of data collection.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *None*			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15ft)			
1. *None*			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5ft)			
1. *Festuca arundinacea*	30	Yes	NI
2. *Phalaris arundinacea*	35	Yes	FACW
3. *Poa pratensis*	30	Yes	FAC
4. *Vicia americana*	2	No	FAC
5. *Myosotis scorpioides*	1	No	FACW
6. *Vicia sativa*	2	No	UPL
7.			
8.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: N/A)			
1. *None*			
2.			
	0	= Total Cover	

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

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

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

☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks:

SOIL

Sampling Point: TPI-10

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-5	10 YR 4/2	100					SL	Thick root mass
5-9								Gravel layer
9-12	10 YR 5/2	90	10 YR 5/6	10	C	M	SL	gravel, cobble
12-15	10 YR 3/2	100					SL	
15+								Mechanical Failure

[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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1 (**except MLRA 1**))
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks: Redox features not present in quantities required in the first 10 inches. Redox starting below 6" requires a minimum thickness of 4", which this test pit lacks. This point was considered wetland despite this lack of a clear hydric soil indicator as the only element precluding the clear presence of a hydric soil indicator was the thickness of the redox features. Given the presence of wetland vegetation and wetland hydrology, we still considered this a hydric 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)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1)(**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☒ No ☐ Depth (inches): 1

Water Table Present? Yes ☒ No ☐ Depth (inches): 6

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 3

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks:

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

Project/Site: TAL-1147 Gunshy Manor City/County: King Sampling Date: 05-10-17

Applicant/Owner: Buff Nelson State: Washington Sampling Point: TPI-11

Investigator(s): JMM/KN/JSM Section, Township, Range: NW 1/4 Section 8, T25N, R6E

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

Subregion (LRR): A Lat: 47.6692 Long: -122.0735 Datum: NAD83

Soil Map Unit Name: Seattle muck NWI classification: None

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

Are Vegetation Yes, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks: Site has been under farm management for decades. Farming and drainage is the "normal circumstances" for this Site. This sample point is located within a hay field that is actively managed for grass species through overseeding and mowing. Upland point located northeast of Wetland I inside a constructed swale. See soil notes on why this sample point was not considered wetland despite the presence of vegetation and hydrology.

Data form originally sampled on 11-14-2016. Sampling data above reflects revised date of data collection.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *None*			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15ft)			
1. *None*			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5ft)			
1. *Phalaris arundinacea*	25	Yes	FACW
2. *Alopecurus geniculatus*	35	Yes	OBL
3. *Festuca arundinacea*	30	Yes	NI
4. *Lactuca serriola*	10	No	FACU
5.			
6.			
7.			
8.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: N/A)			
1. *None*			
2.			
	0	= Total Cover	

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

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

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

☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks:

SOIL

Sampling Point: TPI-11

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 3/2	100					SL	
5-12	10YR 3/2	70					SL	Woody debris and gravel
	10YR 4/1	15*					SL	
	10YR 5/2	10*					SL	
	10YR 5/6	5*						

[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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1 (**except MLRA 1**))
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks: * = These features are not redox. Colors seen are inclusions. Mostly prominent when adjacent to rock faces, but not associated with pores or the matrix and lack diffuse boundaries. Unlike the test pits done within areas considered to be wetland, these mottles are not redox features but are mottles of a different color due to the presence of rock fragments within the soil with varying mineral content. Those are driving the mottle colors, not the movement of water. This seems to be consistent with this sample point being located within a constructed swale.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☒ No ☐ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 0

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks:

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

Project/Site: TAL-1147 Gunshy Manor City/County: King Sampling Date: 05-10-17

Applicant/Owner: Buff Nelson State: Washington Sampling Point: TPI-12

Investigator(s): JMM/KN/JSM Section, Township, Range: NW 1/4 Section 8, T25N, R6E

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

Subregion (LRR): A Lat: 47.6692 Long: -122.0735 Datum: NAD83

Soil Map Unit Name: Norma sandy loam NWI classification: None

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

Are Vegetation Yes, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks: Site has been under farm management for decades. Farming and drainage is the "normal circumstances" for this Site. This sample point is located within a hay field that is actively managed for grass species through overseeding and mowing. Sample point located in the northcentral portion of wetland I. This sample point was considered to be within a wetland despite not meeting a hydric soil indicator because of the presence of hydrophytic vegetation and wetland hydrology, and the fact that this one location is surrounded by wetland. The soil appears to be atypical even for this area, and this is considered an irregularity and not a normal condition. This wetland boundary is based on a number of irregularities.

Data form originally sampled on 11-14-2016. Sampling data above reflects revised date of data collection.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *None*			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15ft)			
1. *None*			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5ft)			
1. *Phalaris arundinacea*	70	Yes	FACW
2. *Festuca rubra*	20	Yes	FAC
3. *Geranium molle*	1	No	NI
4. *Vicia americana*	1	No	FAC
5. *Ranunculus acris*	5	No	FAC
6.			
7.			
8.			
	97	= Total Cover	
Woody Vine Stratum (Plot size: N/A)			
1. *None*			
2.			
	0	= Total Cover	

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

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		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks:

SOIL

Sampling Point: TPI-12

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	100					SL	
4-7	10 YR 4/2	100					GSL	
7+								Mechanical failure

[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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1 (**except MLRA 1**))
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks: No redox features were present within the soil profile evaluated. Hard layer at 7 inches. Impossible to dig hole any deeper with a shovel. Excavator was not used at this location despite lack of pit depth because we did not feel it would change the delineation. The strong presence of wetland hydrology indicates that hydric soils are likely present. Indicator A11 or A12 is a possible indicator at this SP, but due to the mechanical refusal, an indicator isn't proven. We erred on the cautious side.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

Water Table Present? Yes ☒ No ☐ Depth (inches): 3

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 1

Wetland Hydrology Present? **Yes** ☒ **No** ☐

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

Remarks:

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

Project/Site: TAL-1147 Gunshy Manor City/County: King Sampling Date: 05-10-17

Applicant/Owner: Buff Nelson State: Washington Sampling Point: TPI-13

Investigator(s): JMM/KN/JSM Section, Township, Range: NW 1/4 Section 8, T25N, R6E

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

Subregion (LRR): A Lat: 47.6692 Long: -122.0735 Datum: NAD83

Soil Map Unit Name: Norma sandy loam NWI classification: None

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

Are Vegetation Yes, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ☒	No ☐
Hydric Soil Present?	Yes ☐	No ☒
Wetland Hydrology Present?	Yes ☐	No ☒

Is the Sampled Area within a Wetland? Yes ☐ No ☒

Remarks: Site has been under farm management for decades. Farming and drainage is the "normal circumstances" for this Site. This sample point is located within a hay field that is actively managed for grass species through overseeding and mowing. Upland point located north of Wetland I. This point occurred outside of the wetland boundary, and since soils were not hydric, this supported this area not being wetland as it was surrounded by other non-wetland areas.

Data form originally sampled on 11-14-2016. Sampling data above reflects revised date of data collection.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *None*			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15ft)			
1. *None*			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5ft)			
1. *Phalaris arundinacea*	30	Yes	FACW
2. *Ranunculus repens*	3	No	FAC
3. *Trifolium repens*	6	No	FAC
4. *Juncus effusus*	1	No	FACW
5. *Ranunculus acris*	1	No	FAC
6. *Festuca arundinacea*	10	No	NI
7. *Festuca rubra*	20	Yes	FAC
8. *Poa pratense*	25	Yes	FAC
	96	= Total Cover	
Woody Vine Stratum (Plot size: N/A)			
1. *None*			
2.			
	0	= Total Cover	

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

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	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

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

☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks:

SOIL

Sampling Point: TPI-13

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

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

[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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1 (**except MLRA 1**))
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks: No redox features present.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? **Yes** ☐ **No** ☒

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

Remarks: This sample point lacked wetland hydrology, as observed in November 2016 and May 2017.

Appendix C

Wetland Rating Sheets

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RATING SUMMARY – Western Washington

Name of wetland (or ID #): TAL-1147 Wetland H Date of site visit: 04-30-15
Rated by DRT Trained by Ecology? ☒ Yes ☐ No Date of training 10-15
HGM Class used for rating Slope 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 _____

OVERALL WETLAND CATEGORY IV (based on functions ☒ or special characteristics ☐)

1. Category of wetland based on FUNCTIONS

☐ **Category I** – Total score = 23 - 27
☐ **Category II** – Total score = 20 - 22
☐ **Category III** – Total score = 16 - 19
☒ **Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
			Circle the appropriate ratings	
Site Potential	L	L	L	
Landscape Potential	L	L	L	
Value	H	H	M	TOTAL
Score Based on Ratings	5	5	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
Estuarine	☐	I II
Wetland of High Conservation Value	☐	I
Bog	☐	I
Mature Forest	☐	I
Old Growth Forest	☐	I
Coastal Lagoon	☐	I II
Interdunal	☐	I II III IV
None of the above		☒

Wetland name or number TAL-1147 Wetland H

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
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 4.3, 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 unit is found (from web)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
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)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
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 unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
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 150 ft buffer (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 unit is found (from web)	S 3.3	

Wetland name or number TAL-1147 Wetland H

HGM Classification of Wetlands in Western Washington

For questions 1-7, 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 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

☒ NO – go to 2 ☐ **YES** – the wetland class is **Tidal Fringe** – go to 1.1

1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

☐ **NO – Saltwater Tidal Fringe (Estuarine)** ☐ **YES – Freshwater Tidal Fringe**

*If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.*

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

☒ NO – go to 3 ☐ **YES** – The wetland class is **Flats**

*If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.*

3. Does the entire wetland unit **meet all** of the following criteria?
___The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size; ___At least 30% of the open water area is deeper than 6.6 ft (2 m).

☒ NO – go to 4 ☐ **YES –** The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. 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 5 ☒ **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 ft deep).

5. 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 2 years.

☒ NO – go to 6 ☐ **YES** – The wetland class is **Riverine**

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

Wetland name or number TAL-1147 Wetland H

6. 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 7 ☐ **YES** – The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

☒ NO – go to 8 ☐ **YES** – The wetland class is **Depressional**

8. 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 1-7 APPLY TO DIFFERENT AREAS IN THE 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 along stream within boundary of depression	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE

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 TAL-1147 Wetland H

SLOPE WETLANDS **Water Quality Functions** - Indicators that the site functions to improve water quality	
S 1.0. Does the site have the potential to improve water quality?	
S 1.1. Characteristics of the average slope of the 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	3
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	3

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

S 2.0. Does the landscape have the potential to support the water quality function of 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	0
S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1? Other sources _____ Yes = 1 No = 0	0
Total for S 2 Add the points in the boxes above	0

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 (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? Yes = 1 No = 0	1
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 basin in which unit is found.* Yes = 2 No = 0	2
Total for S 3 Add the points in the boxes above	4

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

Wetland name or number TAL-1147 Wetland H

SLOPE WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and stream erosion

S 4.0. Does the site have the potential to reduce flooding and stream 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.* Dense, uncut, **rigid** plants cover > 90% of the area of the wetland points = 1 All other conditions points = 0	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 or cover that generate excess surface runoff? Yes = 1 No = 0	0

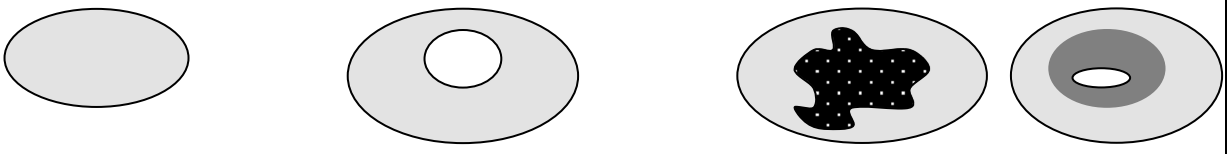
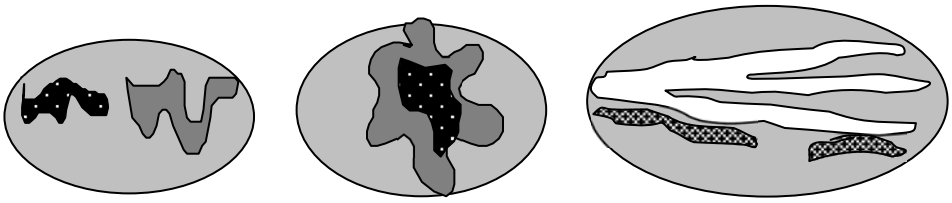
Rating of Landscape Potential If score is: ☐ **1 = M** ☒ **0 = L** *Record the rating on the first page*

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: 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	2
S 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	2
Total for S 6 Add the points in the boxes above	4

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

NOTES and FIELD OBSERVATIONS:

Wetland name or number TAL-1147 Wetland H

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that site functions to provide important habitat	
H 1.0. Does the site have the potential to provide habitat?	
H 1.1. Structure of plant community: *Indicators are Cowardin classes and strata within the Forested class.* Check the Cowardin plant classes in the wetland. *Up to 10 patches may be combined for each class to meet the threshold of ¼ ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked.* ☐ Aquatic bed — 4 structures or more: points = 4 ☒ Emergent — 3 structures: points = 2 ☐ Scrub-shrub (areas where shrubs have > 30% cover) — 2 structures: points = 1 ☐ Forested (areas where trees have > 30% cover) — 1 structure: points = 0 *If the unit has a Forested class, check if:* ☐ The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon	0
H 1.2. Hydroperiods Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ ac to count (*see text for descriptions of hydroperiods*). ☐ Permanently flooded or inundated — 4 or more types present: points = 3 ☒ Seasonally flooded or inundated — 3 types present: points = 2 ☐ Occasionally flooded or inundated — 2 types present: points = 1 ☒ Saturated only — 1 type present: points = 0 ☐ Permanently flowing stream or river in, or adjacent to, the wetland ☐ Seasonally flowing stream in, or adjacent to, the wetland ☐ **Lake Fringe wetland** — **2 points** ☐ **Freshwater tidal wetland** — **2 points**	1
H 1.3. 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 and you do not have to name the species.* ***Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle*** If you counted: > 19 species — points = 2 5 - 19 species — points = 1 < 5 species — points = 0	0
H 1.4. Interspersion of habitats Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *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** = 3points 	0

Wetland name or number TAL-1147 Wetland H

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. *The number of checks is the number of points.* ☐ Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long). ☐ Standing snags (dbh > 4 in) within the wetland ☐ Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ☐ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet weathered where wood is exposed)* ☐ At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated *(structures for egg-laying by amphibians)* ☒ Invasive plants cover less than 25% of the wetland area in every stratum of plants (*see H 1.1 for list of strata*)	1
Total for H 1 Add the points in the boxes above	2

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

H 2.0. Does the landscape have the potential to support the habitat functions of the site?

H 2.1. Accessible habitat (include *only habitat that directly abuts wetland unit*). *Calculate:* % undisturbed habitat 0 **+** [(% moderate and low intensity land uses)/2] 1,139,018 **=** 3% If total accessible habitat is: > $^1/_3$ (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 the wetland. *Calculate:* % undisturbed habitat 10,975,557 **+** [(% moderate and low intensity land uses)/2] 0 **=** % 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	1
H 2.3. Land use intensity in 1 km Polygon: If > 50% of 1 km Polygon is high intensity land use points = (- 2) ≤ 50% of 1 km Polygon is high intensity points = 0	-2
Total for H 2 Add the points in the boxes above	-1

Rating of Landscape Potential If score is: ☐ **4-6 = 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 next page) ☐ It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) ☐ It is mapped as a location for an individual WDFW priority 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 (listed on next page) within 100 m points = 1 Site does not meet any of the criteria above points = 0	1

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

Wetland name or number TAL-1147 Wetland H

WDFW Priority Habitats

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*).

☐ **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.

☐ **Old-growth/Mature forests:** Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multilayered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in (81 cm) dbh or > 200 years of age. 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 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.

☐ **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161 – see web link above*).

☒ **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.

☐ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report – see web link on previous page).*

☐ **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.

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

Wetland name or number TAL-1147 Wetland H

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? ☐ The dominant water regime is tidal, ☐ Vegetated, and ☐ With a salinity greater than 0.5 ppt ☐ Yes –Go to **SC 1.1** ☒ No= **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? ☐ Yes = **Category I** ☐ No - Go to **SC 1.2**	No
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are *Spartina*, see page 25) ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or unmowed grassland. ☐ The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = **Category I** No = **Category II**	No
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? ☐ Yes – Go to **SC 2.2** ☒ No – Go to **SC 2.3** SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? ☐ Yes **= Category I** ☒ No **= Not a WHCV** SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf ☐ Yes **– Contact WNHP/WDNR and go to SC 2.4** ☒ No **= Not a WHCV** SC 2.4. 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 a WHCV**	No
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES you will still need to rate the wetland based on its functions.*** SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? ☐ Yes – Go to **SC 3.3** ☐ No – Go to **SC 3.2** SC 3.2. Does an area within the wetland unit 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 3.3** ☐ No = **Is not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? ☐ Yes = **Is a Category I bog** ☐ No – Go to **SC 3.4** **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 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, 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 4 provide more than 30% of the cover under the canopy? ☐ Yes = **Is a Category I bog** ☒ No **= Is not a bog**	No

Wetland name or number TAL-1147 Wetland H

SC 4.0. Forested Wetlands Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? ***If you answer YES you will still need to rate the wetland based on its functions.*** ☐ **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more. ☐ **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm). ☐ Yes = **Category I** ☒ No = **Not a forested wetland for this section**	No
SC 5.0. Wetlands in Coastal Lagoons Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? ☐ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks ☐ The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* ☐ Yes – Go to **SC 5.1** ☒ No = **Not a wetland in a coastal lagoon** SC 5.1. Does the wetland meet all of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100). ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or unmowed grassland. ☐ The wetland is larger than $^{1}/_{10}$ ac (4350 ft^2) ☐ Yes = **Category I** ☐ No = **Category II**	No
SC 6.0. Interdunal Wetlands Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ***If you answer yes you will still need to rate the wetland based on its habitat functions.*** In practical terms that means the following geographic areas: ☐ Long Beach Peninsula: Lands west of SR 103 ☐ Grayland-Westport: Lands west of SR 105 ☐ Ocean Shores-Copalis: Lands west of SR 115 and SR 109 ☐ Yes – Go to **SC 6.1** ☒ No = **not an interdunal wetland for rating** SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)? ☐ Yes = **Category I** ☐ No – Go to **SC 6.2** SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? ☐ Yes = **Category II** ☐ No – Go to **SC 6.3** SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? ☐ Yes = **Category III** ☐ No = **Category IV**	No
Category of wetland based on Special Characteristics If you answered No for all types, enter "Not Applicable" on Summary Form	N/A

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RATING SUMMARY – Western Washington

Name of wetland (or ID #): TAL-1147 Wetland I Date of site visit: 04-30-15
Rated by DRT Trained by Ecology? ☒ Yes ☐ No Date of training 10-15
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 _____

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

1. Category of wetland based on FUNCTIONS

☐ **Category I** – Total score = 23 - 27
☐ **Category II** – Total score = 20 - 22
☐ **Category III** – Total score = 16 - 19
☐ **Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
			Circle the appropriate ratings	
Site Potential	L	M	L	
Landscape Potential	L	L	L	
Value	H	H	M	TOTAL
Score Based on Ratings	5	6	4	15

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
Estuarine	☐	I II
Wetland of High Conservation Value	☐	I
Bog	☐	I
Mature Forest	☐	I
Old Growth Forest	☐	I
Coastal Lagoon	☐	I II
Interdunal	☐	I II III IV
None of the above		☐

Wetland name or number TAL-1147 Wetland I

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
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 4.3, 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 unit is found (from web)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
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)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
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 unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
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 150 ft buffer (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 unit is found (from web)	S 3.3	

Wetland name or number TAL-1147 Wetland I

HGM Classification of Wetlands in Western Washington

For questions 1-7, 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 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

☒ NO – go to 2 ☐ **YES** – the wetland class is **Tidal Fringe** – go to 1.1

1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

☒ **NO – Saltwater Tidal Fringe (Estuarine)** ☐ **YES – Freshwater Tidal Fringe**

*If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.*

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

☒ NO – go to 3 ☐ **YES** – The wetland class is **Flats**

*If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.*

3. Does the entire wetland unit **meet all** of the following criteria?

___The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size; ___At least 30% of the open water area is deeper than 6.6 ft (2 m).

☒ NO – go to 4 ☐ **YES –** The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. 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 5 ☐ **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 ft deep).

5. 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 2 years.

☒ NO – go to 6 ☐ **YES** – The wetland class is **Riverine**

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

Wetland name or number TAL-1147 Wetland I

6. 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 7 ☒ **YES** – The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

☒ NO – go to 8 ☐ **YES** – The wetland class is **Depressional**

8. 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 1-7 APPLY TO DIFFERENT AREAS IN THE 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 along stream within boundary of depression	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE

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 TAL-1147 Wetland I

DEPRESSIONAL AND FLATS WETLANDS

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

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 is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet). points = 3 Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet. points = 2 Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 1 Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. 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)*. Yes = 4 No = 0	0
D 1.3. Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes): Wetland has persistent, ungrazed, plants > 95% of area points = 5 Wetland has persistent, ungrazed, plants > ½ of area points = 3 Wetland has persistent, ungrazed plants > $^{1}/_{10}$ of area points = 1 Wetland has persistent, ungrazed plants < $^{1}/_{10}$ of area points = 0	0
D 1.4. Characteristics of seasonal ponding or inundation: *This is the area that is ponded for at least 2 months. See description in manual.* Area seasonally ponded is > ½ total area of wetland points = 4 Area seasonally ponded is > ¼ total area of wetland points = 2 Area seasonally ponded is < ¼ total area of wetland points = 0	0
Total for D 1 Add the points in the boxes above	3

Rating of Site Potential If score is: ☐ **12-16 = H** ☐ **6-11 = M** ☒ **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 unit 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	0
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	0

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, lake, or marine water that is on the 303(d) list? Yes = 1 No = 0	1
D 3.2. Is the wetland in a basin or sub-basin where an aquatic resource is on the 303(d) list? Yes = 1 No = 0	1
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 basin in which the unit is found*)? Yes = 2 No = 0	2
Total for D 3 Add the points in the boxes above	4

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

Wetland name or number TAL-1147 Wetland I

DEPRESSIONAL AND FLATS WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and stream degradation

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 is a depression or flat depression with no surface water leaving it (no outlet) points = 4 Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet points = 2 Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch points = 1 Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 0	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 if dry, the deepest part.* Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7 Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5 Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3 The wetland is a "headwater" wetland points = 3 Wetland is flat but has small depressions on the surface that trap water points = 1 Marks of ponding less than 0.5 ft (6 in) points = 0	0
D 4.3. Contribution of the wetland to storage in the watershed: *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* The area of the basin is less than 10 times the area of the unit points = 5 The area of the basin is 10 to 100 times the area of the unit points = 3 The area of the basin is more than 100 times the area of the unit points = 0 Entire wetland is in the Flats class points = 5	3
Total for D 4 Add the points in the boxes above	7

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

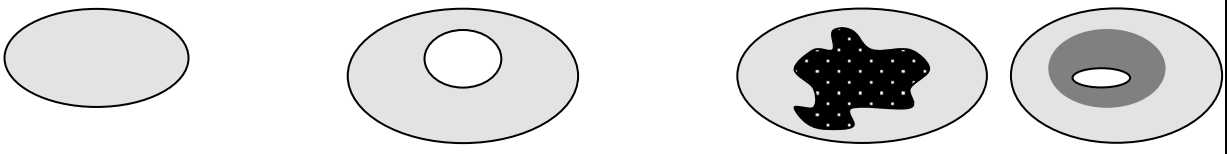
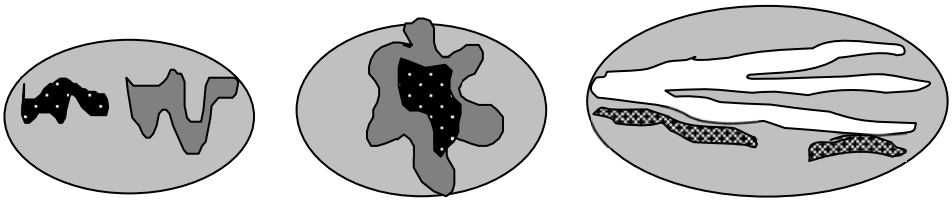
D 5.0. Does the landscape have the potential to support hydrologic functions of the site?	
D 5.1. Does the wetland receive stormwater discharges? Yes = 1 No = 0	0
D 5.2. Is >10% of the area within 150 ft of the wetland in land uses that generate excess runoff? Yes = 1 No = 0	0
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses (residential at >1 residence/ac, urban, commercial, agriculture, etc.)? Yes = 1 No = 0	0
Total for D 5 Add the points in the boxes above	0

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 unit is in a landscape that has flooding problems. *Choose the description that best matches conditions around the wetland unit 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): • Flooding occurs in a sub-basin that is immediately down-gradient of unit. points = 2 • Surface flooding problems are in a sub-basin farther down-gradient. points = 1 Flooding from groundwater is an issue in the sub-basin. 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	2
D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	2
Total for D 6 Add the points in the boxes above	4

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

Wetland name or number TAL-1147 Wetland I

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that site functions to provide important habitat	
H 1.0. Does the site have the potential to provide habitat?	
H 1.1. Structure of plant community: *Indicators are Cowardin classes and strata within the Forested class.* Check the Cowardin plant classes in the wetland. *Up to 10 patches may be combined for each class to meet the threshold of ¼ ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked.* ☐ Aquatic bed — 4 structures or more: points = 4 ☒ Emergent — 3 structures: points = 2 ☐ Scrub-shrub (areas where shrubs have > 30% cover) — 2 structures: points = 1 ☐ Forested (areas where trees have > 30% cover) — 1 structure: points = 0 *If the unit has a Forested class, check if:* ☐ The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon	0
H 1.2. Hydroperiods Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ ac to count (*see text for descriptions of hydroperiods*). ☐ Permanently flooded or inundated — 4 or more types present: points = 3 ☒ Seasonally flooded or inundated — 3 types present: points = 2 ☐ Occasionally flooded or inundated — 2 types present: points = 1 ☒ Saturated only — 1 type present: points = 0 ☐ Permanently flowing stream or river in, or adjacent to, the wetland ☐ Seasonally flowing stream in, or adjacent to, the wetland ☐ **Lake Fringe wetland** — **2 points** ☐ **Freshwater tidal wetland** — **2 points**	1
H 1.3. 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 and you do not have to name the species.* ***Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle*** If you counted: > 19 species — points = 2 5 - 19 species — points = 1 < 5 species — points = 0	0
H 1.4. Interspersion of habitats Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *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** = 3points 	0

Wetland name or number TAL-1147 Wetland I

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. *The number of checks is the number of points.* ☐ Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long). ☐ Standing snags (dbh > 4 in) within the wetland ☐ Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ☐ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet weathered where wood is exposed)* ☐ At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated *(structures for egg-laying by amphibians)* ☒ Invasive plants cover less than 25% of the wetland area in every stratum of plants (*see H 1.1 for list of strata*)	1
Total for H 1 Add the points in the boxes above	2

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

H 2.0. Does the landscape have the potential to support the habitat functions of the site?

H 2.1. Accessible habitat (include *only habitat that directly abuts wetland unit*). *Calculate:* % undisturbed habitat_____ **+** [(% moderate and low intensity land uses)/2] 1,139,018 **=** 3% If total accessible habitat is: > $^1/_3$ (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 the wetland. *Calculate:* % undisturbed habitat 10,975,557 **+** [(% moderate and low intensity land uses)/2]_____ **=** 32% 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	1
H 2.3. Land use intensity in 1 km Polygon: If > 50% of 1 km Polygon is high intensity land use points = (- 2) ≤ 50% of 1 km Polygon is high intensity points = 0	-2
Total for H 2 Add the points in the boxes above	-1

Rating of Landscape Potential If score is: ☐ **4-6 = 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 next page) ☐ It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) ☐ It is mapped as a location for an individual WDFW priority 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 (listed on next page) within 100 m points = 1 Site does not meet any of the criteria above points = 0	1

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

Wetland name or number TAL-1147 Wetland I

WDFW Priority Habitats

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*).

☐ **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.

☐ **Old-growth/Mature forests:** Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multilayered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in (81 cm) dbh or > 200 years of age. 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 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.

☐ **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161 – see web link above*).

☒ **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.

☐ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report – see web link on previous page).*

☐ **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.

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

Wetland name or number TAL-1147 Wetland I

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? ☐ The dominant water regime is tidal, ☐ Vegetated, and ☐ With a salinity greater than 0.5 ppt ☐ Yes –Go to **SC 1.1** ☒ No= **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? ☐ Yes = **Category I** ☐ No - Go to **SC 1.2**	No
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are *Spartina*, see page 25) ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or unmowed grassland. ☐ The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = **Category I** No = **Category II**	No
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? ☐ Yes – Go to **SC 2.2** ☒ No – Go to **SC 2.3** SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? ☐ Yes **= Category I** ☒ No **= Not a WHCV** SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf ☐ Yes **– Contact WNHP/WDNR and go to SC 2.4** ☒ No **= Not a WHCV** SC 2.4. 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 a WHCV**	No
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES you will still need to rate the wetland based on its functions.*** SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? ☐ Yes – Go to **SC 3.3** ☐ No – Go to **SC 3.2** SC 3.2. Does an area within the wetland unit 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 3.3** ☐ No = **Is not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? ☐ Yes = **Is a Category I bog** ☐ No – Go to **SC 3.4** **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 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, 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 4 provide more than 30% of the cover under the canopy? ☐ Yes = **Is a Category I bog** ☒ No **= Is not a bog**	No

Wetland name or number TAL-1147 Wetland I

SC 4.0. Forested Wetlands Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? ***If you answer YES you will still need to rate the wetland based on its functions.*** ☐ **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more. ☐ **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm). ☐ Yes = **Category I** ☒ No = **Not a forested wetland for this section**	No
SC 5.0. Wetlands in Coastal Lagoons Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? ☐ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks ☐ The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* ☐ Yes – Go to **SC 5.1** ☒ No = **Not a wetland in a coastal lagoon** SC 5.1. Does the wetland meet all of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100). ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or unmowed grassland. ☐ The wetland is larger than $^{1}/_{10}$ ac (4350 ft^2) ☐ Yes = **Category I** ☐ No = **Category II**	No
SC 6.0. Interdunal Wetlands Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ***If you answer yes you will still need to rate the wetland based on its habitat functions.*** In practical terms that means the following geographic areas: ☐ Long Beach Peninsula: Lands west of SR 103 ☐ Grayland-Westport: Lands west of SR 105 ☐ Ocean Shores-Copalis: Lands west of SR 115 and SR 109 ☐ Yes – Go to **SC 6.1** ☒ No = **not an interdunal wetland for rating** SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)? ☐ Yes = **Category I** ☐ No – Go to **SC 6.2** SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? ☐ Yes = **Category II** ☐ No – Go to **SC 6.3** SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? ☐ Yes = **Category III** ☐ No = **Category IV**	No
Category of wetland based on Special Characteristics If you answered No for all types, enter "Not Applicable" on Summary Form	N/A

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APPENDIX B
PRELIMINARY GRADING PLAN

CLEANUP ACTION PLAN
Thompson Field
Portion of King County Parcel No. 0825069104
Redmond, Washington

Farallon PN: 650-031

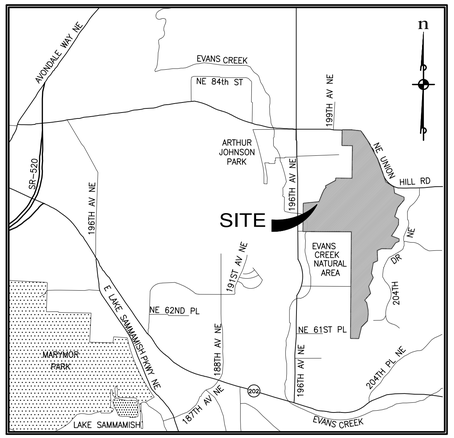
A PORTION OF THE NW & SW 1/4 OF SEC 8, TWP 25 N, RGE 6 E, W.M.

n

SCALE: 1" = 40'

40 20 0 40 80

CONTOUR INTERVAL = 1'



Vicinity Map

APPROXIMATE EARTHWORK QUANTITIES
CUT = 8,850 CY
FILL = 0 CY
NET = 8,850 (CUT)

NOTE

EARTHWORK QUANTITIES ARE "NEAT LINE" ONLY AND DO NOT ACCOUNT FOR SHRINK OR SWELL FACTORS.

KING COUNTY DDES APPROVAL	
Review Engineer	Date
Senior Engineer	Date
Scott Smith, P.E. DEVELOPMENT ENGINEER	Date

File: \\esm-fs\king\esm-jobs\1359\001\007\exhibits\EN-44.dwg
Plotted: 9/22/2022 3:01 PM Plotted By: Greg Fedore

REVISIONS

NO.	DESCRIPTION/DATE	BY

ESM CONSULTING ENGINEERS LLC
33400 8th Ave S, Suite 205
Federal Way, WA 98003
FEDERAL WAY (253) 838-6113
EVERETT (425) 297-9900
www.esmcivil.com
Civil Engineering | Land Surveying | Land Planning
Public Works | Project Management | Landscape Architecture

THE ESTATE OF BARBARA J. NELSON, ET AL.

GUNSHY MANOR

PRELIMINARY MITIGATION GRADING PLAN

KING COUNTY WASHINGTON

JOB NO.:	1359-001-007
DWG. NAME:	EN-44
DESIGNED BY:	LGB
DRAWN BY:	GFF
CHECKED BY:	
DATE:	09/22/2022
DATE OF PRINT:	

EN-44

1 OF 1 SHEETS

APPENDIX C
SAMPLING AND ANALYSIS PLAN

CLEANUP ACTION PLAN
Thompson Field
Portion of King County Parcel No. 0825069104
Redmond, Washington

Farallon PN: 650-031

SAMPLING AND ANALYSIS PLAN

APPENDIX C OF THE CLEANUP ACTION PLAN

THOMPSON FIELD
PORTION OF KING COUNTY PARCEL NO. 0825069104
REDMOND, WASHINGTON

Submitted by:
Farallon Consulting, L.L.C.
975 5th Avenue Northwest
Issaquah, Washington 98027

Farallon PN: 650-031

For:
Estate of Barbara J. Nelson and WCN GST Non-Exempt Marital Trust No. 2
c/o Nelson Legacy Group, LLC
16508 Northeast 79th Street
Redmond, Washington 98052

October 5, 2022

Prepared by:

Courtney van Stolk, L.G.
Staff Geologist

Reviewed by:

Paul C. Grabau, L.G., L.H.G.
Principal Hydrogeologist

TABLE OF CONTENTS

1.0 INTRODUCTION 1-1
1.1 PURPOSES 1-1
1.2 ORGANIZATION 1-2

2.0 SAMPLING OBJECTIVE 2-1
2.1 SOIL SAMPLING 2-1
2.1.1 Performance Monitoring 2-1
2.1.2 Confirmation Monitoring 2-2

3.0 CLEANUP ACTION WORK ELEMENTS 3-1
3.1 CONTAMINATED SOIL REMOVAL 3-1
3.2 CONFIRMATION OF THE CLEANUP ACTION 3-1

4.0 SAMPLING EQUIPMENT AND PROCEDURES 4-1
4.1 SAMPLING PROCEDURES 4-1
4.1.1 Excavation 4-1
4.2 SAMPLE DESIGNATION 4-2
4.2.1 Soil Sampling 4-2

5.0 LABORATORY ANALYSIS 5-1
5.1 LABORATORY ANALYTICAL METHODS 5-1
5.2 LABORATORY REPORTING LIMITS 5-1
5.3 DATA QUALITY OBJECTIVES 5-1
5.4 DATA QUALITY CONTROL 5-2
5.5 LABORATORY DATA PACKAGE REQUIREMENTS 5-2
5.6 CORRECTIVE ACTION 5-3
5.7 DATA MANAGEMENT 5-4
5.8 DATA VALIDATION 5-4

6.0 SAMPLE HANDLING 6-1
6.1 SAMPLE CONTAINERS, PRESERVATION PROCEDURES, AND HOLD TIMES 6-1
6.2 SAMPLE PACKAGING AND SHIPMENT 6-1
6.3 SAMPLE DOCUMENTATION 6-2

7.0 MANAGEMENT OF INVESTIGATION-DERIVED WASTE 7-1
7.1 WASTE SOIL 7-1
7.2 DISPOSABLES 7-1

8.0 FIELD DOCUMENTATION 8-1
8.1 FIELD REPORT FORM..... 8-1
8.2 LOG OF BORING FORM..... 8-1
8.3 SOIL SAMPLE DATA LOG 8-1
8.4 SAMPLE LABEL..... 8-1
8.5 WASTE MATERIAL LABEL 8-2
8.6 WASTE INVENTORY TRACKING SHEET 8-2
8.7 CHAIN OF CUSTODY FORM..... 8-2

APPENDICES

Appendix A Standard Operating Procedures

Appendix B Field Sampling Forms

1.0 INTRODUCTION

This Sampling and Analysis Plan (SAP) has been prepared by Farallon Consulting, L.L.C. (Farallon) for the Estate of Barbara J. Nelson and WCN GST Non-Exempt Marital Trust No. 2 to present the specific requirements for sample collection and analytical activities for the cleanup action at the portion of King County Parcel No. 0825069104 in Redmond, Washington known as Thompson Field. The area on the western portion of Thompson Field where total naphthalene concentrations and total carcinogenic polycyclic aromatic hydrocarbon (cPAH) toxic equivalent concentrations (TECs) in soil exceed Washington State Model Toxics Control Act Cleanup Regulation (MTCA) cleanup levels, as established in Chapter 173-340 of the Washington Administrative Code, is herein referred to as the Thompson Field Site. The overall objectives of the cleanup action are to remediate concentrations of cPAHs and naphthalene on the Thompson Field Site; to obtain sufficient data to meet the requirements of MTCA for the cleanup action; and to obtain an unrestricted No Further Action determination for the Site from the Washington State Department of Ecology (Ecology).

The purpose of the SAP is to define the specific requirements for sample collection and analytical activities to ensure that activities are conducted in accordance with technically acceptable protocols, and that the results meet the data quality objectives. The SAP presents the protocols pertaining to sampling equipment and procedures and sample handling and analysis that will be used for the cleanup action at the Thompson Field Site. Sampling objectives, sample locations, and measurement frequencies also are described. The SAP provides a basis for conducting field activities and a mechanism for complying with quality assurance requirements. The SAP also provides standard operating procedures (SOPs) pertaining to sampling equipment, sample collection and handling, and the laboratory analysis that will be used for groundwater monitoring and sampling. The SOPs for the cleanup action at the Thompson Field Site are provided in Appendix A.

1.1 PURPOSES

The specific purposes of this SAP are to:

- Provide the basis for conducting and documenting the field activities to meet the scope of work described in the draft *Cleanup Action Plan, Thompson Field, Portion Of King County Parcel No. 0825069104, Redmond, Washington* dated October, 5, 2022 prepared by Farallon Consulting, L.L.C. for the Estate of Barbara J. Nelson and WCN GST Non-Exempt Marital Trust No. 2 (CAP);
- Describe the sample locations, sample quantities, analytical methods, and documentation protocols for the sampling program; and
- Describe the equipment, procedures, and methodology to be used for soil sample collection.

1.2 ORGANIZATION

The SAP is organized into the following sections:

- **Section 2, Sampling Objective**, provides a description of the soil sampling that will be conducted as part of the cleanup action.
- **Section 3, Cleanup Action Work Elements**, provides a description of contaminated soil removal and confirmation of the cleanup action.
- **Section 4, Sampling Equipment and Procedures**, provides details on the sampling procedures and the sample designation that will be used for the cleanup action.
- **Section 5, Laboratory Analysis**, lists the laboratory analytical methods and laboratory reporting limits that will be used in conducting the cleanup action, the data quality objectives, data quality control, laboratory data package requirements, corrective action, and data management and validation.
- **Section 6, Sample Handling**, provides details on the sample containers, preservation procedures, and hold times; sample packaging and shipment, and sample documentation.
- **Section 7, Management of Investigation-Derived Waste**, provides details on the management of waste soil and disposables generated from the cleanup action.
- **Section 8, Field Documentation**, summarizes the procedures and forms that will be used to document the field activities conducted as part of the cleanup action.

2.0 SAMPLING OBJECTIVE

The sampling objective for the cleanup action is to collect sufficient soil samples to confirm that concentrations of cPAHs and naphthalene remaining in soil at the Thompson Field Site after completion of the cleanup action do not exceed defined cleanup levels at the point of compliance for soil defined in the CAP.

The primary objective of the cleanup action at the Site is to mitigate human exposure risk to constituents of concern (COCs) in soil that pose a potential threat to human health via the direct contact pathway in an efficient, timely, and cost-effective manner to the maximum extent practicable, while minimizing impacts to the wetland areas of the Thompson Field Site. The COCs for soil are cPAHs and naphthalene.

The cleanup action will consist of the following work elements:

- Removing soil containing concentrations of the COCs exceeding MTCA Method A soil cleanup levels.
- Sampling and analyzing performance soil samples collected from the excavation to guide the excavation.
- Conducting confirmation soil sampling in selected areas of the Thompson Field Site to confirm that the cleanup standards for soil have been achieved.

2.1 SOIL SAMPLING

Performance and confirmation soil samples will be collected during cleanup action excavation activities to identify contaminated soil and segregate it from clean soil, and to ensure that cleanup standards are met at the point of compliance for the Thompson Field Site. Soil samples will be collected either using hand tools or from an excavation bucket. To prevent potential cross-contamination, soil samples collected from an excavator bucket will be collected from soil that is not in contact with the sides of the excavator bucket. Soil samples will be evaluated for field indications of contamination such as the presence of staining, odor, or an elevated photoionization detector reading. Soil samples will then be transferred into laboratory-supplied containers for laboratory analysis as described in Section 6.0, Sample Handling. Sample locations will be measured in the field either from a static reference point (e.g., the distance from the excavation sidewalls) or by using a handheld global positioning system unit.

2.1.1 Performance Monitoring

Performance samples were collected during the Remedial Investigation and supplemental subsurface investigation performed by Farallon from 2020 through July 2021 to assist with defining the lateral and vertical extent of contaminated soil, and classifying the soil for disposal. Soil analytical results for samples collected during previous investigations were presented in the *Remedial Investigation Report, Thompson Field Site, Portion of King County Parcel No. 0825069104, Redmond, Washington* dated April 6, 2021 prepared by Farallon (RI Report), and the

letter regarding Addendum to Remedial Investigation Report, Thompson Field Site, Portion of King County Parcel No. 0825069104, Redmond, Washington dated February 24, 2022 from Stuart Brown and Clifford T. Schmitt of Farallon to Frank Winslow of Ecology (RI Addendum Letter). Additional performance soil sampling will involve collecting and analyzing an estimated 30 performance soil samples, as needed to support identifying, classifying, and segregating impacted soil in the excavation area. Discrete soil samples will be collected from excavation grids as needed to guide the excavation, and to serve as confirmation samples where cleanup levels are attained. The performance soil sample locations will be based on the grid excavation areas, prior soil sampling results, and field-screened observations of soil conditions. Farallon understands that the excavation subcontractor will provide an operator and equipment as needed to assist with soil sampling activities. The laboratory analytical results for soil samples collected to date and analyzed for polycyclic aromatic hydrocarbons (PAHs) are summarized in the RI Report and RI Addendum Letter.

2.1.2 Confirmation Monitoring

Confirmation soil samples were collected during previous investigations to confirm the final limits of the soil excavation area at the Thompson Field Site. These soil sampling locations where cleanup levels were attained at the limits of the excavation area will be used as confirmation sampling points. Soil analytical results for samples collected during previous investigations were summarized in the RI Report and the RI Addendum Letter. Farallon will collect additional confirmation soil samples during the excavation activities as needed to demonstrate that contaminated soil identified during previous investigations and contaminated soil discovered during excavation activities is removed at the lateral and vertical limits of the excavation to the maximum extent practicable. At a minimum, Farallon will collect confirmation soil samples from the floor and sidewalls of the excavation beneath and proximate to the locations of performance soil samples containing one of more COCs at a concentration exceeding MTCA Method A cleanup levels that were collected during previous investigations. Confirmation samples will be collected generally as follows:

- Excavation sidewall samples will be collected along the sidewalls of the remedial excavation at a rate of approximately one sample per 30 linear feet of sidewall.
- Excavation floor samples will be collected at the base of the excavation at a rate of approximately one per 30- by 30-foot sampling grid, with the exception of sampling grid cells where sufficient confirmation soil samples were collected during previous investigations.

3.0 CLEANUP ACTION WORK ELEMENTS

This section provides a description of contaminated soil removal and confirmation of the cleanup action. The soil and groundwater sampling for the cleanup action will be conducted in general accordance with the Ecology *Guidance on Sampling and Data Analysis Methods* dated January 1995 (Publication No. 94-49). The cleanup action has been divided into the following work elements, described in the sections below:

- Removal and off-site disposal of soil with concentrations of cPAH- and naphthalene-exceeding MTCA Method A cleanup levels; and
- Confirmation of the cleanup action.

3.1 CONTAMINATED SOIL REMOVAL

This work element consists of removing soil containing concentrations of cPAHs and naphthalenes exceeding MTCA Method A cleanup levels from the Thompson Field Site. Excavation of such soil will be conducted within an approximately 85,000-square-foot area of contaminated fill on the western part of Thompson Field. The approximate excavation area is shown on the preliminary grading plan provided in Appendix B of the CAP. The actual area of excavation will be guided by performance soil sampling results. Excavated soil will be designated as a dangerous waste. Historical soil analytical data will be used to generate a waste profile for pre-approval, allowing the excavated soil to be transported off the Thompson Field Site directly to a licensed Subtitle D landfill facility for disposal.

Performance monitoring via soil sampling will be conducted to evaluate concentrations of cPAHs and naphthalene in soil during excavation. Farallon may use the performance soil samples for confirmation monitoring, if appropriate. The sampling procedures and the sample designation that will be used for the field data collection phase of the cleanup action are detailed in Section 4, Sampling Equipment and Procedures.

3.2 CONFIRMATION OF THE CLEANUP ACTION

The final work element is confirmation of the cleanup action, which involves confirmation soil sampling that will be conducted to demonstrate compliance with the cleanup standards presented in the CAP, and with any modified cleanup standards proposed based on performance sampling results. Confirmation soil sampling will consist of collecting soil samples at selected locations to an estimated maximum depth of 7 feet below ground surface (bgs) or to the depth needed to obtain samples with COC concentrations less than MTCA Method A cleanup levels. The estimated depths of the excavation based on historical soil analytical data is shown on Figure 3 of the CAP.

4.0 SAMPLING EQUIPMENT AND PROCEDURES

This section provides details on the sampling procedures and the sample designation that will be used for the field data collection phase of the cleanup action. Specific SOPs for the various sampling procedures are provided in Appendix A. A copy of the Field Report form that will be used for the data collection phase is provided in Appendix B.

4.1 SAMPLING PROCEDURES

The field sampling procedures, drilling methods, and sample handling protocols for soil samples are discussed below. Field sampling data will be documented on Field Report forms, as described in Section 8, Field Documentation.

4.1.1 Excavation

Performance monitoring will be conducted during and following excavation activities to document concentrations of COCs in soil. Soil samples will be collected and handled in accordance with the procedures listed below:

- Soil samples will be collected directly from the sidewalls and/or bottom of the remedial excavation using either stainless steel or plastic sampling tools. Non-dedicated sampling equipment will be decontaminated between uses, as appropriate.
- Information logged during sampling will include at a minimum: sample depth; Unified Soil Classification System soil description; soil moisture; physical indications of contamination (e.g., odor, staining); and field-screening results obtained using a photoionization detector.
- Soil samples will be transferred immediately into laboratory-supplied sample containers. Care will be taken not to handle the seal or the inside cap of the container when the sample is placed into the container. The container will be filled to minimize headspace, and the seal/cap will be secured.
- The sample container will be labeled with the client name, project name and number, date and time sampled, sample identification, sampler's initials, analysis, and analyte preservative(s), if any.
- The sample will be logged on a Chain of Custody form and placed into a cooler at approximately 4 degrees Celsius for transport to the laboratory under chain-of-custody protocols.
- Disposable sampling and health and safety supplies and equipment will be discarded in an appropriate waste dumpster at the Thompson Field Site.

4.2 SAMPLE DESIGNATION

Each sample collected during the cleanup action will be assigned a unique sample identifier and number that will be recorded in indelible ink on a sample label that will be affixed to the corresponding container immediately prior to sample collection. In addition to the sample identifier and number, the sample labels will include the client name, project name and number, date and time of sample collection, sampler's initials, analytical method, and analyte preservative(s), if any. A Soil Sample Data log will be maintained as each sample is collected, which will include the sample location and depth, sample number and identifier, and other observations regarding the sample. The sample designation procedures for soil and groundwater samples collected during the cleanup action are detailed below.

4.2.1 Soil Sampling

Soil samples collected from the excavation borings will be assigned a unique sample identifier that will include the components listed below:

- The sidewall/base of excavation location (e.g., B-1, MW-3, or ESW);
- The sample date (e.g., 040123); and
- The depth of the sample stated in feet bgs (e.g., 8-10).

For example, a soil sample collected from boring B-1 at a depth of 8 to 10 feet bgs on April 1, 2023 would be assigned the identifier B1-040123-8-10. A soil sample collected from the east sidewall of an excavation at a depth of 10 feet bgs on April 1, 2023 would be assigned the identifier ESW-040123-10. The sample identifier will be placed on the sample label, Field Report form, Soil Sample Data log, and Chain of Custody form.

5.0 LABORATORY ANALYSIS

OnSite Environmental Inc. of Redmond, Washington (OnSite) has been selected as the laboratory to conduct the analysis of all other soil, and groundwater samples collected in association with the cleanup action. OnSite is Ecology-certified and meets Ecology and U.S. Environmental Protection Agency (EPA) QA/QC requirements. A copy of the laboratory Quality Assurance Manual for OnSite that will be followed throughout the cleanup action is on file at the Farallon office for review and reference.

5.1 LABORATORY ANALYTICAL METHODS

Soil samples collected for performance and confirmation monitoring will be analyzed for cPAHs and naphthalene by EPA Method 8270E/SIM. Soil samples collected during excavation activities will be transported to OnSite under standard chain-of-custody protocols for analysis on an expedited turnaround time to prevent delays in the excavation schedule.

5.2 LABORATORY REPORTING LIMITS

The laboratory reporting limits (or practical quantitation limits) for EPA Method 8270E/SIM are approximately 0.008 milligrams per kilogram for naphthalene and cPAHs. The laboratory reporting limits are based on current laboratory data, and may be modified during the cleanup action as the methodology is refined. Instances may arise where a high sample concentration, the non-homogeneity of samples, or matrix interferences preclude achieving laboratory reporting limits.

5.3 DATA QUALITY OBJECTIVES

Data quality objectives for this project will be used to develop and implement procedures to ensure that the data collected are of sufficient quality to adequately address the cleanup action objectives. Observations and measurements will be made and recorded in a manner so as to yield results representative of the media and conditions observed and/or measured. Goals for representativeness will be met by ensuring that sampling locations are selected properly, a sufficient number of samples are collected, and field-screening and laboratory analyses are conducted properly.

The data quality objectives for this project are:

- Collecting performance soil samples in the excavation area to evaluate the effectiveness of the cleanup action, and the point where cleanup standards likely have been achieved;
- Collecting confirmation soil samples to evaluate soil conditions at the limits of the excavation; and
- Achieving a practical quantitation limit sufficient for direct comparison against MTCA cleanup levels.

The quality of the field sampling methods and the laboratory data will be assessed using the parameters precision, accuracy, representativeness, comparability, completeness, and sensitivity. Laboratory data quality objectives have been established by the analytical laboratory, and are specified in the individual analytical laboratory Quality Assurance Manual The analytical laboratory Quality Assurance Manual will be kept on file at the Farallon corporate office in Issaquah, Washington.

5.4 DATA QUALITY CONTROL

Data will undergo two levels of QA/QC evaluation: one by the laboratory, and one by Farallon. Initial data reduction, evaluation, and reporting will be performed by the laboratory as specified in the laboratory Quality Assurance Manual. The analytical data will then be validated by Farallon under the supervision of the project data manager. The following types of QC information will be reviewed, as appropriate:

- Method deviations;
- Sample extraction and hold times;
- Method reporting limits;
- Blank samples (e.g., trip and laboratory method);
- Relative percent difference, for precision;
- Matrix spike/matrix spike duplicate (MS/MSD) samples, for accuracy;
- Surrogate recoveries; and
- Percent completeness.

Farallon will review field records and results from field observations and measurements to ensure that procedures were properly performed and documented. Field procedures will be reviewed for the following elements:

- Completeness and legibility of field logs;
- Preparation and frequency of field QC samples;
- Field equipment calibration and maintenance; and
- Chain of Custody forms.

5.5 LABORATORY DATA PACKAGE REQUIREMENTS

Laboratory data packages will consist of a laboratory report and an electronic data deliverable. Laboratory reports will include the following elements:

- Case narrative;
- Analytical notes;

- QC narrative;
- Sample inventory report;
- Analytical results; and
- Data qualifiers and abbreviations.

The electronic data deliverable will include at a minimum:

- Sample identification information;
- Sample media;
- Sampling, laboratory receiving, extraction, and analysis dates;
- Analyte and Chemical Abstracts Service Reference No.;
- Reported concentrations and reporting units;
- Analytical method detection limits;
- Machine reporting limits and reporting units; and
- QA/QC results, including identification of MS/MSD and surrogate samples.

5.6 CORRECTIVE ACTION

Corrective action will be the joint responsibility of the project manager and the project data manager. Corrective procedures may include:

- Identifying the source of deviation from the quality standards set forth in the CAP and its supporting documents;
- Re-analyzing soil samples if hold time criteria permit;
- Re-sampling and analyzing soil, if necessary to meet the quality standards set forth in this CAP;
- Evaluating and amending sampling, analytical, and/or data transfer procedures; and/or
- Qualifying data to indicate the level of uncertainty.

During field operations and sampling procedures, field team members will be responsible for identifying and correcting equipment malfunctions, and documenting sampling procedures in a manner that will enable the project manager or the project data manager to evaluate whether corrective action is warranted.

Equipment malfunctions, variances in sampling protocols, and corrective actions taken by field team members will be documented in the field notes. The project manager or the project data manager will evaluate the field notes upon submittal to determine whether the corrective action taken was adequate to meet project quality standards, or whether additional corrective action is required.

5.7 DATA MANAGEMENT

The final repository for sample analytical information will be the Environmental Quality Information System (EQuIS) database. The electronic data deliverables received from the laboratories will be directly transferred into the EQuIS database, reducing the likelihood of data entry errors. The project data manager will manage and maintain the EQuIS database.

Farallon will directly transfer the analytical data provided by the laboratory into the Ecology Environmental Information Management System, thus eliminating the likelihood of data entry errors inherent in manual data entry.

Field measurements and other data requiring manual entry will be reviewed by Farallon personnel other than the data entry staff prior to submission to the Environmental Information Management System. Ecology's confirmation of receipt of the data will be maintained in the Farallon project files.

5.8 DATA VALIDATION

Farallon will conduct a Level I Compliance Screening on all analytical data.

All chemical data will be reviewed with regard to the following:

- Chain-of-custody documentation;
- Sample preservation and hold times;
- Method blanks;
- Reporting limits;
- Surrogate recoveries;
- MS/MSD recoveries;
- Laboratory control sample recoveries; and
- Laboratory relative percent differences.

Data validation will be based on the QA/QC criteria recommended in the methods identified in this CAP.

Data usability, conformance with QA/QC objectives, any deviations that may have affected the quality of the data, and the basis for application of qualifiers, will be discussed in the final reporting of the data. Any corrective actions required based on evaluation of the analytical data will be determined by the laboratory in consultation with the project manager, and may include qualification or rejection of the data.

6.0 SAMPLE HANDLING

This section describes the sample handling methods to be used for the cleanup action. The topics discussed consist of sample containers, preservation procedures, and hold times; sample packaging and shipment; and sample documentation. Additional details are provided in the SOPs provided in Appendix A.

Upon transfer of the samples to laboratory personnel or arrival of the samples at the laboratory, the laboratory will assume responsibility for custody of the samples. Laboratory personnel will document the status of shipping and handling containers, and will adhere to standard chain-of-custody procedures to track each sample through all of the stages of laboratory processing.

6.1 SAMPLE CONTAINERS, PRESERVATION PROCEDURES, AND HOLD TIMES

Soil samples collected from the excavation will be placed into 4- or 8-ounce jars fitted with Teflon-lined lids. Once sealed, each container will be stored in a cooler at approximately 4 degrees Celsius. The samples will be submitted to the laboratory for analysis for PAHs by EPA Method 8270E/SIM within 24 to 48 hours of collection.

6.2 SAMPLE PACKAGING AND SHIPMENT

The samples shipped for laboratory analysis will be packaged according to applicable regulations and the recommendations of the laboratory performing the analysis. After the samples have been sealed in coolers, they will be expeditiously transported to the analytical laboratory.

The procedures below, which represent the minimum shipping and handling requirements, will be used for sample packaging:

- A sample label will be affixed to the corresponding sample container at the time of sample collection.
- Bubble-wrap bags or equivalent will be used to protect glass sample containers.
- Sample containers will be placed into a cooler and checked against the Chain of Custody form to ensure that all samples are listed and are placed into the correct cooler.
- One copy of the Chain of Custody form will be detached and retained by Farallon field staff.
- Remaining paperwork will be sealed in a resealable plastic bag and taped to the inside of the cooler lid.
- One to three resealable bags will be filled with ice and/or chemical equivalent and included in the cooler. Ice will be double-bagged in heavy-duty bags.
- The cooler will be sealed with a chain-of-custody seal.

- The cooler will be taped shut using strapping tape.
- The laboratory address will be affixed to the cooler.
- Extraneous stickers will be removed from the cooler.
- The cooler will be examined to ensure that Farallon's return address is affixed.

6.3 SAMPLE DOCUMENTATION

Sample containers will be identified with a durable label, and the sample identifier will be recorded in the Soil Sample Data Log and on the Field Report forms (Appendix B). Other sample documentation to be maintained by field personnel includes Purging and Sampling forms, Chain of Custody forms and seals, sample labels, and shipment bills. Examples of these forms are provided in Appendix B.

Sample containers will be labeled with the client name, project name and number, date and time sampled, sample identifier, sampler's initials, analysis, and analyte preservative(s), if any.

At the time of sampling, the appropriate sample containers will be selected, and the sample number for each sample will be recorded on the Soil Sample Data Log and on the Field Report form. A chain-of-custody seal will be used to seal the cooler shut before shipping. The chain-of-custody seal is used to show that no tampering occurred between the time the cooler was relinquished by field personnel and the time it arrived at the laboratory. The chain-of-custody seal will be attached so that it must be broken for the shipping container to be opened. Information recorded on the seals will be checked against sample summary log entries, and the samples will be recounted before leaving the Site to verify that no samples were misplaced. Entries for all samples will be made on the Chain of Custody form prior to transfer of the samples off the Thompson Field Site.

Each Chain of Custody form will contain the medium, date, time sampled, sample identification and number, project name, project number, sampler's initials, and analyte preservative(s) if any.

7.0 MANAGEMENT OF INVESTIGATION-DERIVED WASTE

Waste soil, water, and other products generated during the cleanup action may be contaminated, and will be containerized and stored on the Thompson Field Site pending receipt of analytical results for selection of a disposal method. Specific criteria for tracking the sampling and analysis of the wastes to identify appropriate disposal options for each of the expected waste streams are discussed below.

7.1 WASTE SOIL

Waste soil will be generated by the excavation of contaminated soil. Waste soil generated during the excavation will be removed from the Thompson Field Site and transported as nonhazardous waste to the selected Subtitle D landfill.

7.2 DISPOSABLES

Disposable personal protective clothing (e.g., Tyvek suits, rubber gloves, boot covers) and disposable sampling devices (e.g., plastic scoops and bailers) will be cleaned, placed into plastic garbage bags, and disposed of off the Thompson Field Site as nonhazardous waste.

8.0 FIELD DOCUMENTATION

Documentation of field activities will be provided on Field Report forms, Log of Boring forms, Soil Sample Data logs, sample and waste material labels, Waste Inventory Tracking Sheets, and Chain of Custody forms. Copies of these forms are provided in Appendix B. Documentation generated during the field program will be retained in the project file and included in the reports generated, as appropriate.

8.1 FIELD REPORT FORM

Field personnel will be required to keep a daily field log on a Field Report form. Field notes will be as descriptive and inclusive as possible, enabling independent parties to reconstruct the sampling situation from the recorded information. Language will be objective, factual, and free of inappropriate terminology. A summary of each day's events will be provided on the Field Report form. At a minimum, field documentation will include the date, job number, project identification and location, weather conditions, sample collection data, personnel present and responsibilities, field equipment used, and any activities performed in a manner other than as specified in the SAP. If other forms or documents such as well-head surveys or maps are completed or used, they will be cited in and attached to the Field Report form. Field personnel will sign the completed Field Report form.

8.2 LOG OF BORING FORM

A Log of Boring form will be prepared by a Farallon Scientist for each boring drilled during the cleanup action. The log includes hydrologic conditions, lithologic descriptions using the Unified Soil Classification System, and information on the potential presence of contamination.

8.3 SOIL SAMPLE DATA LOG

A Soil Sample Data Log will be used by field staff during soil sampling activities to record information pertaining to the soil samples being collected. This form includes entries for the sample location, identification, and depth; the time sampled; field-screening results; the types and number of containers collected, and a brief lithologic description.

8.4 SAMPLE LABEL

A sample label is filled out and affixed to the corresponding sample container immediately prior to sample collection. The label is filled out in indelible ink and includes the medium, date, time sampled, sample identification and number, project name, project number, sampler’s initials, and analyte preservative(s) if any.

8.5 WASTE MATERIAL LABEL

A waste material label is filled out and affixed to the corresponding waste container immediately upon filling. The label is filled out in indelible ink and includes the job number and name, the address where the waste was generated, container contents, date, consultant's name and phone number, and sampler's initials.

8.6 WASTE INVENTORY TRACKING SHEET

A Waste Inventory Tracking Sheet will be used to document and track the wastes generated during the cleanup action. The form will include information pertaining to the waste container, the origin of the waste, the type of waste, the date generated, the date removed from the Thompson Field Site, the transporter, and the disposal location.

8.7 CHAIN OF CUSTODY FORM

The written procedures that are followed whenever samples are collected, transferred, stored, analyzed, or destroyed are designed to create an accurate written record that can be used to trace the possession and handling of the sample from the moment of its collection through analysis and reporting of analytical values. This written record, the Chain of Custody form, will be filled out by field sampling personnel at the time a sample is obtained.

The samples submitted to the laboratory are accompanied by the Chain of Custody form. This form is checked for accuracy and completeness, signed, and dated by the laboratory sample custodian accepting the sample. At the laboratory, each sample is assigned a unique, sequential laboratory identification number that is stamped or written on the Chain of Custody form.

Samples are held under internal chain of custody in the Sample Control room under the appropriate storage conditions (e.g., ambient, refrigeration, frozen). The laboratory project manager assigned to a client is responsible for tracking the status of the samples throughout the laboratory. Samples are signed out of the Sample Control room in a sample control logbook by the analyst who will prepare the samples for analysis.

The Chain of Custody form includes the client name, project name and number, date and time sampled, sample identifier, sampler's initials, analysis, and analyte preservative(s), if any.

APPENDIX A
STANDARD OPERATING PROCEDURES

SAMPLING AND ANALYSIS PLAN
Thompson Field
Portion of King County Parcel No. 0825069104
Redmond, Washington

Farallon PN: 650-031

STANDARD OPERATING PROCEDURE EQ-01
EQUIPMENT DECONTAMINATION PROCEDURES

PURPOSE AND APPLICATION

The purpose of this standard operating procedure (SOP) is to provide field personnel with the methodology for decontaminating sampling equipment during various field activities. The step-by-step guidelines provided in this SOP are to be followed by the field crew during all site visits, as applicable.

EQUIPMENT AND SUPPLIES/REAGENTS

The following equipment is necessary to properly decontaminate field equipment during various field tasks:

- Rinse water or distilled water.
- Deionized water.
- Liquinox or other phosphate-free detergent.
- Paper towels.
- Labeled squirt bottles.
- Long-handled hard-bristle brushes (for sediment and soil).
- Cotton swabs.
- Plastic sheeting, garbage bags, and aluminum foil (for sediment and soil).
- Core liner caps or plastic wrap and rubber bands (for sediment and soil).
- Extension arm for cleaning core liners (for sediment and soil).
- Plastic 5-gallon bucket.
- U.S. Department of Transportation-approved drum(s) for decontamination water unless other water-handling arrangements have been made. Separate drums are needed for liquid and solid wastes (see Farallon SOP WM-01, Field-Handling of Investigation-Derived Waste). Liquid wastes should not be added to drums containing solid wastes.

Dilute Liquinox with distilled water in a squirt bottle in accordance with the instructions on the Liquinox package, and label the bottle. Fill another squirt bottle with distilled water, and label the bottle.

FIELD EQUIPMENT TO BE DECONTAMINATED AFTER USE

Decontaminate the following field equipment at the conclusion of field work each day, in accordance with the procedures outlined in this SOP:

- Water-level meter.
- Horiba/YSI multiparameter probe.
- Bladder pump.
- Submersible pump.
- Sediment and soil collection and processing equipment.

WATER-LEVEL METER DECONTAMINATION

Decontaminate the water-level meter after measuring the water level at a monitoring well before moving to a new monitoring well, using the following procedures:

- Spray the bottom half of a paper towel with the diluted Liquinox solution, and the upper half with deionized water.
- Grip the measuring tape of the water-level meter with the paper towel in one hand with the Liquinox side down toward the monitoring well casing.
- Begin slowly reeling up the water-level meter while maintaining firm contact between the measuring tape and the paper towel.
- Ensure that no debris or contamination remains on the measuring tape of the water-level meter once it has been reeled up.
- Use a clean new paper towel for each successive decontamination of the measuring tape of the water-level meter.

HORIBA/YSI MULTIPARAMETER PROBE DECONTAMINATION

Decontaminate the Horiba/YSI multiparameter probe at the end of each workday or after sampling a monitoring well with high concentrations of contamination, using the following procedures:

- Remove the multiparameter probe from the flow-through cell, and thoroughly spray each component with deionized water.
- Use a cotton swab to gently clean around each sensor probe, ensuring that all contaminated water and material has been washed away.
- Refill the protective dissolved oxygen and pH probe caps with deionized water, and replace prior to storage.
- Once the multiparameter probe has been adequately cleaned, replace the protective shield, and return the probe to the case. If the device appears to be overly wet, allow it to air-dry with the case open.

- Do not use Liquinox to clean any probes on the Horiba multiparameter probe, as it may damage the device.

BLADDER PUMP DECONTAMINATION

Decontaminate the bladder pump after sampling a well and at the end of each workday, using the following procedures:

- After extracting the bladder pump from the well, break down the pump, remove and dispose of the used bladder, and spray each component with the diluted Liquinox solution, followed by deionized water.
- Wipe away any visible contamination or debris with a paper towel.
- Capture cleaning water in a liquid waste drum for proper disposal in accordance with Farallon SOP WM-01, Field-Handling of Investigation-Derived Waste.
- Ensure that all contamination and Liquinox solution is washed off all components before reassembling the device, installing a new bladder, and moving to sample a new well.

SUBMERSIBLE PUMP DECONTAMINATION

Decontaminate the submersible pump after purging water from any well, using the following procedures:

- After extracting the submersible pump from the well, thoroughly spray down the pump with the diluted Liquinox solution, followed by deionized water.
- Wipe away any visible contamination or debris with a paper towel.
- Purge clean water through the pump and tubing to ensure that contaminated water has been cleared from all lines.
- Capture cleaning water in a liquid waste drum for proper disposal in accordance with Farallon SOP WM-01, Field-Handling of Investigation-Derived Waste.

SEDIMENT AND SOIL SAMPLING AND PROCESSING EQUIPMENT DECONTAMINATION

Decontaminate sampling equipment used to collect and process sediment and soil samples, using the following procedures:

- Place contaminated equipment and decontamination tools on plastic sheeting.
- Thoroughly rinse all used equipment with distilled water in a 5-gallon bucket to remove excess sediment or soil.
- Pour one capful of Liquinox solution into a 5-gallon bucket filled with tap water or distilled water.
- Using a long-handled hard-bristle brush, thoroughly scrub the equipment with the Liquinox solution until no sediment or soil particles remain.

- Holding the equipment over a 5-gallon bucket, double-rinse the equipment with distilled water until no Liquinox solution remains. Do not allow clean equipment to come into contact with a contaminated surface.
- Drain the equipment and place it in a clean, dry place to prevent recontamination.
- If decontaminated equipment will not be re-used immediately, wrap stainless steel equipment (e.g., bowls, spoons) in aluminum foil with the dull side facing the equipment. Seal polycarbonate core liners with core caps or cellophane plastic. Rubber-band ends to ensure a proper seal.
- After decontamination has been completed, place disposable items into a garbage bag, and store decontamination water in a drum in accordance with Farallon SOP WM-01, Field-Handling of Investigation-Derived Waste.

STANDARD OPERATING PROCEDURE GN-01
FIELD NOTE PROCEDURES

PURPOSE AND APPLICATION

The purpose of this standard operating procedure (SOP) is to provide field personnel with the information needed to document site and sampling activities during field work. The step-by-step guidelines provided in this SOP are to be followed by the field personnel during field work.

GENERAL FIELD NOTE INSTRUCTIONS

- Use a blue or black pen.
- Always document time in military time.
- Record your full name and the names of other Farallon employees present. Initials of personnel can be used after the full names have been provided in the field notes.
- Don't leave line spaces between field note entries.
- Keep handwriting neat.
- Be concise.

ITEMS TO INCLUDE IN FIELD NOTES

At Start of Workday:

- Document when and where you started the field day and when you arrived at the site.
- Note any stops along the way to the site.

Upon Arrival at Site:

- Note the reason for the site visit/site work.
- Document the weather on page 1, and throughout the day if the weather changes.
- Document the time personnel arrive at the site and the name of the company/agency they are affiliated with.
- Document the time subcontractors arrive, the tasks they are conducting, and the time they leave the Site.
- Conduct the Health and Safety (H&S) meeting, ensure all participants sign the H&S form, and include the signed H&S form in the field notes.
- Calibrate equipment: document equipment model number/serial number, calibration method, and results. Be specific (e.g., "Calibrated Horiba for pH using 4.0 standard." "Calibrated PID using 100 ppm isobutylene span gas and ambient air as zero gas."). Note whether the instrument is Farallon's or a rental. If using a rental, include in the field notes the calibration sheet that should have come with the equipment. If using two sets of

equipment, note on the field forms which equipment was used for each location. For example, label "Horiba 1" and "Horiba 2" on the groundwater sampling sheets, and document the serial numbers of the instruments in the field notes. Make sure to document the calibration results for Farallon equipment in the Rite-in-the-Rain notebook kept in each field equipment case.

- Document when work starts at a specific task location (e.g., well or boring), and document what equipment Farallon or the subcontractors are using at that location.
- Measure out and record the sample locations (using a rolling wheel, or GPS if available), and mark utilities on a field map if applicable.
- If media samples will be collected, complete the appropriate documentation form, or record the information in the field notes. For example, record field sampling methods (e.g., grab, composite), the type of media (e.g., soil, groundwater, stormwater), the time the sample was collected, sample location and ID, analytical method(s), the laboratory conducting the analysis, the size of the sample container, the number of containers used, and the preservative included in the sample container. If a composite sample is collected, record how many composite points make up the sample, and document where the composite samples were collected.
- If multiple samples are collected using the same methods and the same type of sample containers, simply document that a sample was collected the same as previous samples.
- Document when work is complete at each location.
- If conducting groundwater monitoring, note the condition of monitoring well monuments (e.g., bolts missing, gasket needed).
- Throughout the workday, note any relevant information (e.g., QC-sampling discrepancies, unexpected conditions, abnormal sampling events).

At End of Workday:

- Decontaminate equipment and note the decontamination method (e.g., Alconox and towels).
- Review the field notes, and complete sketches of any relevant features and sample locations if necessary.
- Record whether wastes were generated. If so, record how much was generated, whether the waste was sampled, and where the waste is stored.
- Place an "Analysis Pending" label on drums of waste, and fill out the label completely.
- Complete a drum inventory sheet and note the drum/container sizes and how much waste was accumulated.
- Document when you left the site;

- Document when you returned to the office or when the field day ended.
- Note any additional work performed after returning to the office (e.g., finished field notes, downloaded field photos).

Make sure to include any of the following forms relevant for the type of field work conducted:

- Daily Field Notes
- Health and Safety Meeting form
- Water Level Summary form
- Low Flow Well Purging and Sampling Data form
- Boring and/or test pit logs
- Monitoring Well Construction Data form
- Soil Sample Data form
- SVE Monitoring form
- Any site-specific operation and maintenance or pilot test forms
- Elevation Survey Data form
- Utility Clearance Log
- Waste Inventory Tracking Sheet
- Copy of the laboratory Chain of Custody form for any samples collected
- Copies of subcontractor daily log sheets (e.g., utility locate, drilling)
- Copies of rental equipment calibration sheets
- Near Miss form (if applicable)
- Incident Report form (if applicable)

Assemble all field forms used each day, scan, save to the electronic project Field Notes folder, and give the hard copy of the forms to the Project Manager.

Refer to the Farallon Field Documentation Checklist and the *Doc Reqs by Field Task list.*

STANDARD OPERATING PROCEDURE WM-01

FIELD HANDLING OF INVESTIGATION-DERIVED WASTE

PURPOSE AND APPLICATION

The purpose of this standard operating procedure (SOP) is to provide field personnel with the methodology for containerizing, labeling, and tracking investigation-derived waste (IDW), and for exchanging information with the Project Manager. IDW may include soil cuttings, purge water, development water, and/or decontamination water.

This SOP has been developed in compliance with Washington State Dangerous Waste Regulations (Chapter 173-303 of the Washington Administrative Code), Oregon Hazardous Waste Management Rules (Division 100 of Chapter 340 of the Oregon Administrative Record), Environmental Health Standards for the Management of Hazardous Waste (Division 4.5 of Title 22 of the California Code of Regulations), and the U.S. Environmental Protection Agency Resource Conservation and Recovery Act (Parts 239 through 282 of Title 40 of the Code of Federal Regulations).

EQUIPMENT AND SUPPLIES/REAGENTS

The following equipment is necessary to properly containerize, label, and track IDW:

- U.S. Department of Transportation-approved drum(s) constructed of a material that does not react with the contaminants of concern for the project. Farallon typically uses lined open-top steel drums. Use a polyethylene drum for a material suspected to be corrosive.
- Labels appropriate to the characteristics of the IDW as indicated by the Project Manager:
    - Non-Hazardous Waste Labels: For IDW known to be nonhazardous based on previous data and waste profiles.
    - Hazardous Waste or Washington State Dangerous Waste Labels: For IDW known to be hazardous/dangerous based on previous data and waste profiles.
    - On Hold Pending Analysis Labels: For waste not previously characterized, pending receipt of analytical results. On Hold Pending Analysis labels are temporary, and should be replaced with the applicable waste label once the waste has been characterized.
    - Major risk labels associated with the waste characteristics.
- Waste Inventory Tracking Sheet.
- Grease marking pencil or paint pen.
- Indelible ink pen.
- Crescent wrench, speed wrench, socket wrench, or other hand tool to seal the drum(s).

- Sampling supplies, if needed, including:
  - Stainless steel or plastic bowls and spoons for homogenizing soil and/or solids samples, depending on the analysis to be performed;
  - Glass or stainless steel container for homogenizing liquid samples, depending on the analysis to be performed; and
  - Stainless steel hand-auger or a glass tube, depending on the medium being sampled (i.e., soil/solids or liquid).

PROCEDURES

Follow the instructions below to inspect, label, and inventory IDW drums, and to containerize IDW:

- Inspect new drums brought to the site to ensure that they do not have dents or corrosion, and are in good condition. Lined or coated drums are preferred.
- Inspect drums remaining at the site from previous project work. Notify the Project Manager if a drum is leaking, damaged, or improperly labeled.
- Place soil and solids into separate drums from those containing liquids such as purge water, development water, and decontamination water. Do not add liquid IDW to drums containing soil or solids. Do not fill drums containing liquid IDW above 85 percent capacity, particularly in areas known to reach freezing temperatures.
- Discuss with the Project Manager whether chlorinated solvents or other contaminants of concern detected in areas of the site would cause IDW from that area to be characterized as hazardous/dangerous waste. Hazardous/dangerous waste should be drummed separate from nonhazardous/dangerous waste, where possible, to minimize the amount of hazardous/dangerous waste generated.
- Use a grease pencil or paint pen to clearly mark the lid and the label of each drum with a unique identifier such as a number or a letter. Verify that no two drums have the same identifier marked on the lid or label, including drums remaining from previous project work.
- Inventory each Farallon-generated drum and its contents on a Waste Inventory Tracking Sheet.
- Track any waste added to an existing drum on a Waste Inventory Tracking Sheet.
- Label each drum with a completed Non-Hazardous Waste, Hazardous Waste/Washington State Dangerous Waste, On Hold Pending Analysis, or other appropriate waste label. List the client's name as the Shipper or Generator, and the accumulation start date as the date when waste was first placed into the drum. If waste was added to an existing drum, add that date to the accumulation dates on the drum label. If the waste in the drum has been designated as hazardous/dangerous, add a major risk label(s) pertaining to the waste characteristics associated with that designation (e.g. flammable, reactive, corrosive,

toxic). Consult the Project Manager with questions about appropriate major risk labels. All labels should be placed with the top of the label toward the top of the drum. Do not place a drum label sideways or upside down.

Use care when drumming, labeling, and tracking IDW. Mistakes in the disposal of waste can result in serious legal and financial repercussions for Farallon and the client.

DRUM SAMPLING

Sampling and analysis of wastes for hazardous/dangerous waste characterization purposes is to be conducted in accordance with U.S. Environmental Protection Agency Publication No. SW-846, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*. Samples collected in California for hazardous waste characterization are to adhere to the requirements specified in California Code of Regulations Sections 66261.21 to 66261.24 of Title 22, Characteristics of Hazardous Waste. Discuss with the Project Manager the specific analyses to be performed prior to sample collection. The instructions below are to be followed for drum sampling, using composite sampling techniques to sample soil, solids, and liquid wastes:

- Collect soil/solids samples from various locations and depths in the drum using a hand-auger or other decontaminated apparatus. Place all samples into a single decontaminated stainless steel bowl using decontaminated stainless steel tools, or into a plastic bowl using plastic spoons, depending on the analyses to be performed. Homogenize the samples in the bowl.
- Place samples of the homogenized soil/solids from the bowl into sample jars for analysis.
- Collect liquid samples from the drum using a glass sampling tube. Insert the tube to the base of the drum to fill the entire tube with liquid. Place the liquid into sample jars for analysis.

DRUM STORAGE

Follow the instructions below for drum storage:

- Label and store the drums in an area approved by the client.
- Store hazardous/dangerous waste drums in a secured area.

DOCUMENTATION

Document IDW drums on the Waste Inventory Tracking Sheet as described above. Provide the original Waste Inventory Tracking Sheet and the original field notes to the Project Manager.

REFERENCE

U.S. Environmental Protection Agency. *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*. Publication No. SW-846. Third Edition, Final Updates I (1993), II (1995), IIA (1994), IIB (1995), III (1997), IIIA (1999), IIIB (2005), IV (2008), and V (2015).

APPENDIX B
FIELD SAMPLING FORMS

SAMPLING AND ANALYSIS PLAN
Thompson Field
Portion of King County Parcel No. 0825069104
Redmond, Washington

Farallon PN: 650-031

FIELD SAMPLING FORMS

1. Field Report Form
2. Log of Boring Form
3. Soil Sample Data Log
4. Sample Label
5. Waste Material Label
6. Waste Inventory Tracking Sheet
7. Chain Of Custody Form

FARALLON CONSULTING

Washington
Issaquah | Bellingham | Seattle

Oregon
Portland | Baker City

California
Oakland | Folsome | Irvine

FIELD REPORT

Page ___ of ___

Date: _____ **Project #:** _____ **Task #:**_____

Project: _____ **Site Address:** _____

Client: _____ **Contractor:** _____

Weather: _____ **Temp:** _____

Equipment Used: _____

Hours: _____ _____ **Mileage:** _____ **Project Manager:** _____

Contractor *Staff*

Prepared By: _____ **Reviewed By:** _____

Comments:

FIELD REPORT (continued)

Page ___ of ___

Project: _____ Date: _____ Project #: _____ Task #:_____

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Log of Boring:

Page ___ of ___

Client:	**Date/Time Started:**	**Sampler Type:**
Project:	**Date/Time Completed:**	**Drive Hammer (lbs.):**
Location:	**Equipment:**	**Depth of Water ATD (feet bgs):**
Farallon PN:	**Drilling Company:**	**Total Boring Depth (feet bgs):**
Logged By:	**Drilling Operator:**	**Total Well Depth (feet bgs):**
	Drilling Method:	

Depth (feet bgs)	Sample Interval	Lithologic Description Soil Constituents; Grain size; Color; Density; Moisture; Odor; Other	USCS	% Recovery	Blow Counts 8/8/8	PID (ppm*)	Sample ID	Well Construction Details
0								
5								
10								
15								
20								

Notes

SOIL SAMPLE DATA

PROJECT NAME: | PROJECT NO: | SHEET OF

PROJECT LOCATION:

PID MODEL & SERIAL NO: | CALIBRATION DATE/STANDARD:

SAMPLE METHOD: ☐ SONIC ☐ HAND AUGER ☐ HOLLOW STEM ☐ SPLIT SPOON ☐ GEOPROBE ☐ BACKHOE BUCKET

EQUIP DECON:

LOCATION	DATE	SAMPLE NAME	DISCRETE OR COMPOSITE	DEPTH	TIME	STAINING	ODOR	PID	SHEEN	LITHOLOGIC DESCRIPTION/NOTES

PREPARED BY:

OnSite
Environmental Inc.

14648 NE 95th Street
Redmond, WA 98052
(425) 883-3881

Client _____

Project _____

Sample ID _____

Date _____ Time _____

Analysis _____ Preservative _____

NON-HAZARDOUS WASTE

OPTIONAL INFORMATION

Shipper _____

Address _____

City, State, Zip _____

Contents _____

NON-HAZARDOUS WASTE

WASTE INVENTORY TRACKING SHEET

Project Number: _____ **Page:** 1 **of** 1

Project Name: _____ **Generation Date:** _____

Project Address: _____ **Prepared By:** _____

Field Work Description: _____ **Date Waste Removed:** _____

Project Manager: _____ **Waste Transporter:** _____

Waste Disposal Location: _____

Unique Container ID	Container Size	% Capacity Used	Contents (Soil/GW/Decon Water)/ Origin (Boring or Well ID)	Date(s) Accumulated	Labeling (Contents Under Test/ Haz/Non-Haz/Other-Specify)	Sampled (Y/N)	Comments

NOTES: Contents should be specified and include identification of well/boring, media, source, depth of soil (if applicable), and any other helpful information.

Container ID should be unique when compared against other nearby containers. Special waste labels may include flammable, corrosive, dangerous when wet, and/or oxidizer.

Location of Drums (sketch or describe):

FARALLON CONSULTING

Chain of Custody

Page _____ of _____

OnSite Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • Fax: (425) 885-4603

Company:

Project Number:

Project Name:

Project Manager:

Sampled by:

Turnaround Request (in working days)

(Check One)

- ☐ Same Day
- ☐ 1 Day
- ■ 2 Day
- ☐ 3 Day
- ☐ Standard (7 working days)
- ☐ _____ (other)

Laboratory Number:

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Dx	Volatiles by 8260B	Halogenated Volatiles by 8260B	Semivolatiles by 8270C	PAHs by 8270C / SIM	PCBs by 8082	Pesticides by 8081A	Herbicides by 8151A	Total RCRA Metals (8)	TCLP Metals	HEM by 1664	VPH	EPH					% Moisture

	Signature	Company	Date	Time
Relinquished by				
Received by				
Relinquished by				
Received by				
Relinquished by				
Received by				

Comments/Special Instructions:

Reviewed by/Date

Reviewed by/Date

Chromatograms with final report ☐

DISTRIBUTION LEGEND: White - OnSite Copy Yellow - Report Copy Pink - Client Copy