



civil & structural  
engineering & planning

# DRAINAGE REPORT

## Williams Investments Commercial Park

16430 51<sup>st</sup> Ave NE  
Arlington, WA 98223



CG Project No.: 20084.20

*09/13/2023*

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## **Section I – Project Overview**

### **Section I Summary**

*Overview*

*Existing Condition*

*Developed Condition*

*Vicinity Map*

*Aerial Photograph*

### **Overview**

This project is the development of four buildings (mostly for commercial use), along with associated driveways, parking, sidewalks, and landscape areas to a 19.38-acre site at the southwest corner of the 168<sup>th</sup> Street NE and 47<sup>th</sup> Ave NE Arlington, WA 98223 (TPN: 31052800100700).

The predeveloped site was developed with an existing SFR, garage and associated patio and driveway areas. The vegetation onsite consists of pasture, wetland and associated buffers, and forested areas along the south side of the site. A 50' Olympic pipeline runs from south to north through the center of the parcel however, it will not be affected by the proposed site improvements.

In the developed condition, the east side of the property will be cleared and regraded, excluding some areas near the north side of the site where the existing wetland buffer is located. Two entrances will be off 47<sup>th</sup>, and one entrance will be located off 168<sup>th</sup>.

The project will comply with the 2019 Stormwater Management Manual for Western Washington (herein referred to as the SWMMWW). The project must address Minimum Requirements #1-9 of the SWMMWW and must also submit a Construction Stormwater General Permit to the Washington State Department of Ecology because land disturbance will be over an acre.

The site is within the Mixed-Use CG-General Commercial zone. Surrounding areas include LI- Light Industrial to the north, GI- General Industrial to the east, RMod – Residential Moderate Capacity to the west, and HC- Highway Commercial to the northwest. The site is at the southern border of the City of Arlington.

### **Existing Condition**

The site totals 19.38 ac and was developed with an existing SFR, garage and associated patio and driveway areas. The vegetation onsite consists of pasture, wetland and associated buffers, and forested areas along the south side of the site. A 50' Olympic pipeline runs from south to north through the center of the parcel however, it will not be affected by the proposed site improvements.

In general, the site slopes from northeast to southwest with slopes ranging from 0.6% at the northeast side of the site to 2.7% at the west side of the site. The site is flat to moderate. Per the geotechnical report, the underlying soil underneath 1 to 1.5 feet of agricultural surface layer consists of outwash sand with isolated silt, consistent with the mapped geology. The soils for the project correspond to hydrologic soil group "A."

Groundwater was visible in the test pits and borings done for the geotechnical report. In addition to the groundwater table, there is also several instances of perched groundwater nearer the surface.

Developed Condition

Most of the site will be developed with four commercial buildings along with associated parking, and landscaped areas. Vegetation on the west side of the property will remain while the vegetation within the site clearing limits will be installed per the landscape architect.

Water and sewer mains will be extended into the development, and stormwater will be controlled on site and will infiltrate 100% into proposed infiltration trenches. Additionally, an overflow rip rap pad has been provided in the design for the infiltration facilities.

Two entrances will be off 47<sup>th</sup>, and one entrance will be located off 168<sup>th</sup>. Street improvements include a new sidewalk and planter strip along 47<sup>th</sup> Ave NE and a new access along 168<sup>th</sup> St NE. The site totals 8.203 ac in the proposed condition with half street of 47<sup>th</sup> included. The total amount of disturbance on and offsite including the right of way improvements totals 8.769 acres.

The proposed lot coverage is as follows:

*Pervious Areas*

|                            |                  |
|----------------------------|------------------|
| Wetland and buffer:        | 412,585 sf       |
| <u>Pasture, Flat, A/B:</u> | <u>74,164 sf</u> |
| Total:                     | 486,749 sf       |

*Impervious Areas Onsite*

|                                 |                  |
|---------------------------------|------------------|
| Roof, Flat:                     | 132,266 sf       |
| Walkways, Flat:                 | 22,239 sf        |
| Driveways & Drive Aisles, Flat: | 150,059 sf       |
| <u>Landscaping, Flat:</u>       | <u>52,758 sf</u> |
| Total:                          | 357,322 sf       |

*Impervious Areas Offsite*

|                                  |                   |
|----------------------------------|-------------------|
| Walkways, Flat:                  | 7,876 sf          |
| Roads, Flat:                     | 14,491 sf         |
| <u>Landscaping, Flat:</u>        | <u>2,276 sf</u>   |
| Total:                           | 24,643 sf         |
| <b>Total Site Area:</b>          | <b>381,965 sf</b> |
| <b>Total Site Area (Onsite):</b> | <b>357,322 sf</b> |

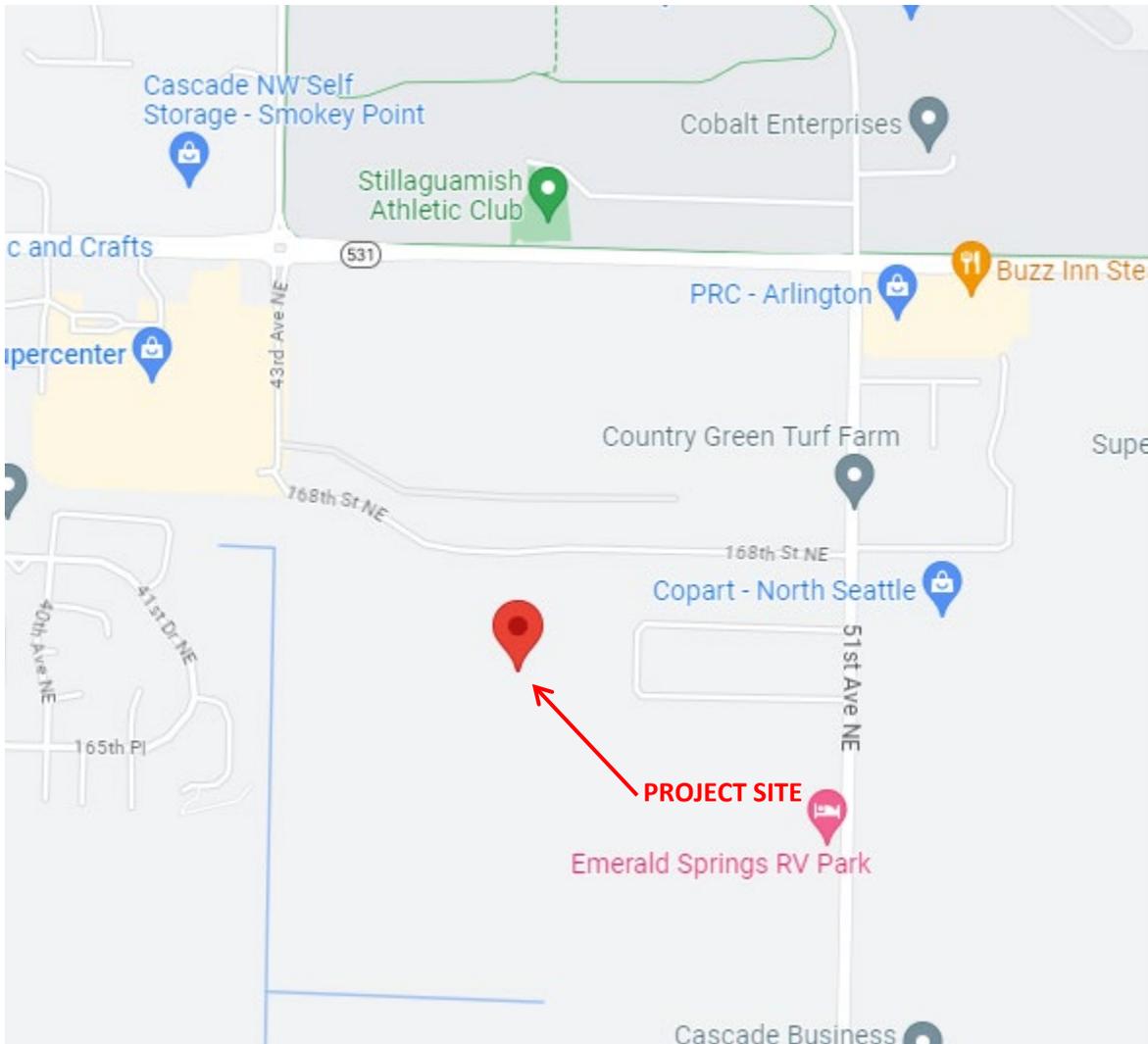


Figure I-1 Vicinity Map



Figure I-2 Aerial Photograph

## **Section II – Minimum Requirements**

### **Section II Summary**

#### *Narrative*

Stormwater requirements were determined from the 2019 SWMMWW. This report is based on the steps recommended in Chapter 3 of Volume I in the SWMMWW. The project will comply with Minimum Requirements #1-9.

**Minimum Requirement #1: Preparation of Stormwater Site Plans:** The stormwater site plan consists of this report and the civil drawings and is prepared in accordance with Chapter 3 of Volume 1 of the SWMMWW.

**Minimum Requirement #2: Construction Stormwater Pollution Prevention Plan (SWPPP):** The SWPPP shall include a narrative and drawings. The SWPPP narrative shall include documentation that addresses the 13 elements of Construction Stormwater Pollution Prevention. See Section V and the civil drawings. A Construction Stormwater General Permit must also be submitted to the Washington State Department of Ecology because land disturbance will be over an acre.

**Minimum Requirement #3: Source Control of Pollution:** Source control BMPs during construction are described in Section IV. For this site we have looked at the pool for compliance with 2019 SWMMWW S433.

**Minimum Requirement #4: Preservation of Natural Drainage Systems and Outfalls:** Natural drainage patterns shall be maintained, and discharges from the project site shall occur at the natural location, to the maximum extent practicable. The manner by which runoff is discharged from the project site must not cause a significant adverse impact to downstream receiving waters and down-gradient properties. All projects shall submit an off-site qualitative analysis. A qualitative analysis of the upstream and downstream system entering the site is presented in Section III.

**Minimum Requirement #5: On-Site Stormwater Management:** Per Table I-3.1 from the SWMMWW, new development projects on any parcel inside the Urban Growth Area that trigger Minimum Requirements #1 through #9 must demonstrate compliance with the Low Impact Development Performance Standard and BMP T5.13; or use On-Site Stormwater Management BMPs from List #2. The project proposes to meet the Low Impact Development Standard using gravel infiltration trenches and BMP T5.13. See Section IV.

**Minimum Requirement #6: Runoff Treatment:** This requirement applies to the new plus replaced hard surfaces and the converted vegetation areas. Runoff treatment is required because the project adds more than 5,000 sf of pollution-generating hard surface. The project will meet runoff treatment using gravel infiltration trenches designed to infiltrate 100% of site runoff.

**Minimum Requirement #7: Flow Control:** Projects must provide flow control to reduce the impacts of stormwater runoff from hard surfaces and land cover conversions. The project will meet the flow control duration standard using gravel infiltration trenches designed to infiltrate 100% of site runoff. See Section IV.

**Minimum Requirement #8: Wetlands Protection:** This requirement applies only to projects whose stormwater discharges into a wetland, either directly or indirectly through a conveyance system. Stormwater from the site does not discharge into a wetland and therefore this requirement is not applicable.

**Minimum Requirement #9: Operation and Maintenance:** An Operation and Maintenance Manual that is consistent with the provisions in Volume V of the SWMMWW is required for proposed Stormwater Treatment and Flow Control BMPs/facilities. The party (or parties) responsible for maintenance and operation shall be identified in the operation and maintenance manual. For private facilities, a copy of the Operation and Maintenance Manual shall be retained on-site or within reasonable access to the site and shall be transferred with the property to the new owner. For public facilities, a copy of the operation and maintenance manual shall be retained in the appropriate department. A log of maintenance activity that indicates what actions were taken shall be kept and be available for inspection. Please see Section VIII.

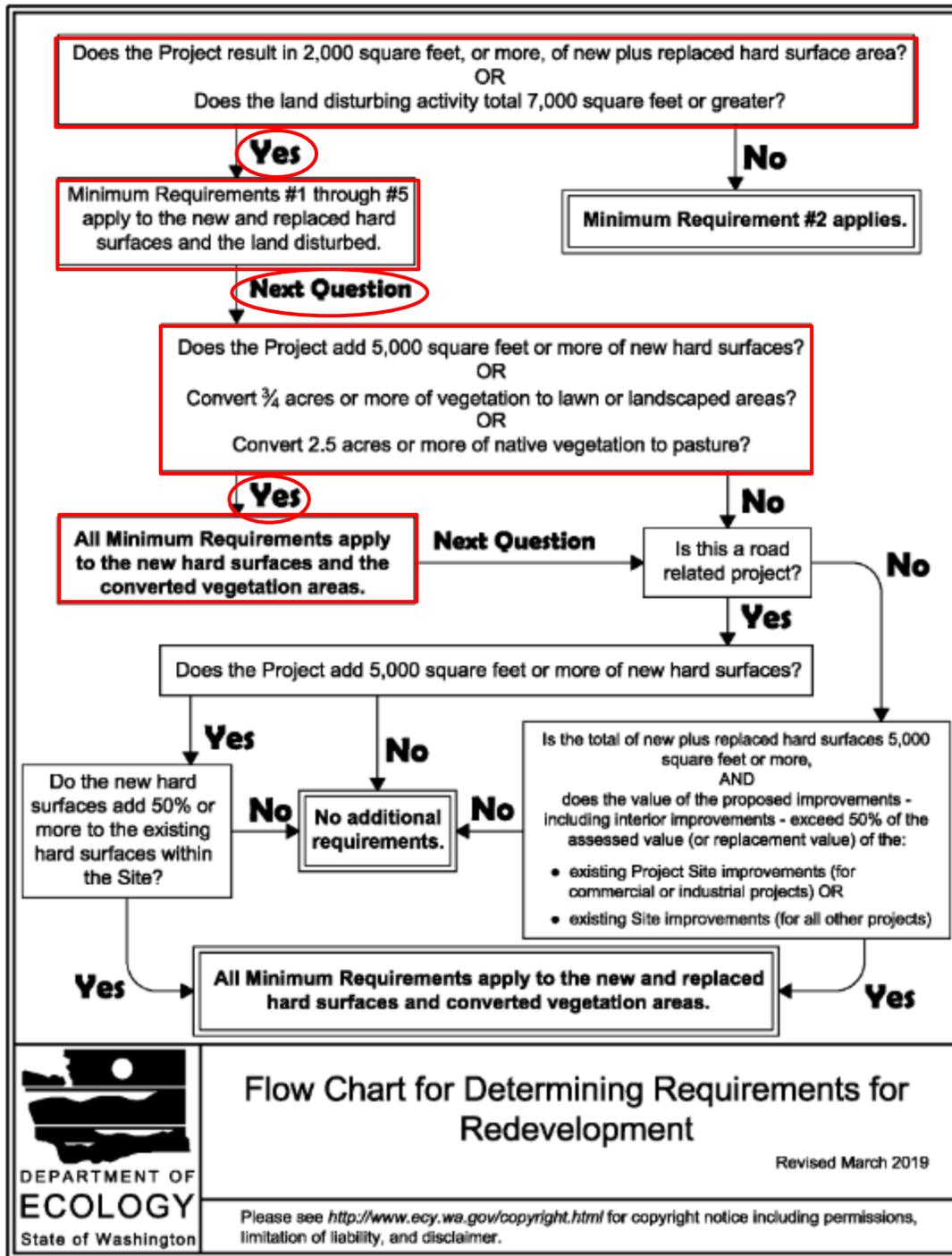


Figure II-1 Flow Chart Determining Minimum Requirements for Redevelopment (Figure I-3.2 in the 2019 SWMMWW)

## **Section III – Off-Site Analysis**

### **Section III Summary**

*Task 1 – Define and map the study area*

*Task 2 – Review all available information of the study area*

*Task 3 – Field inspect the area*

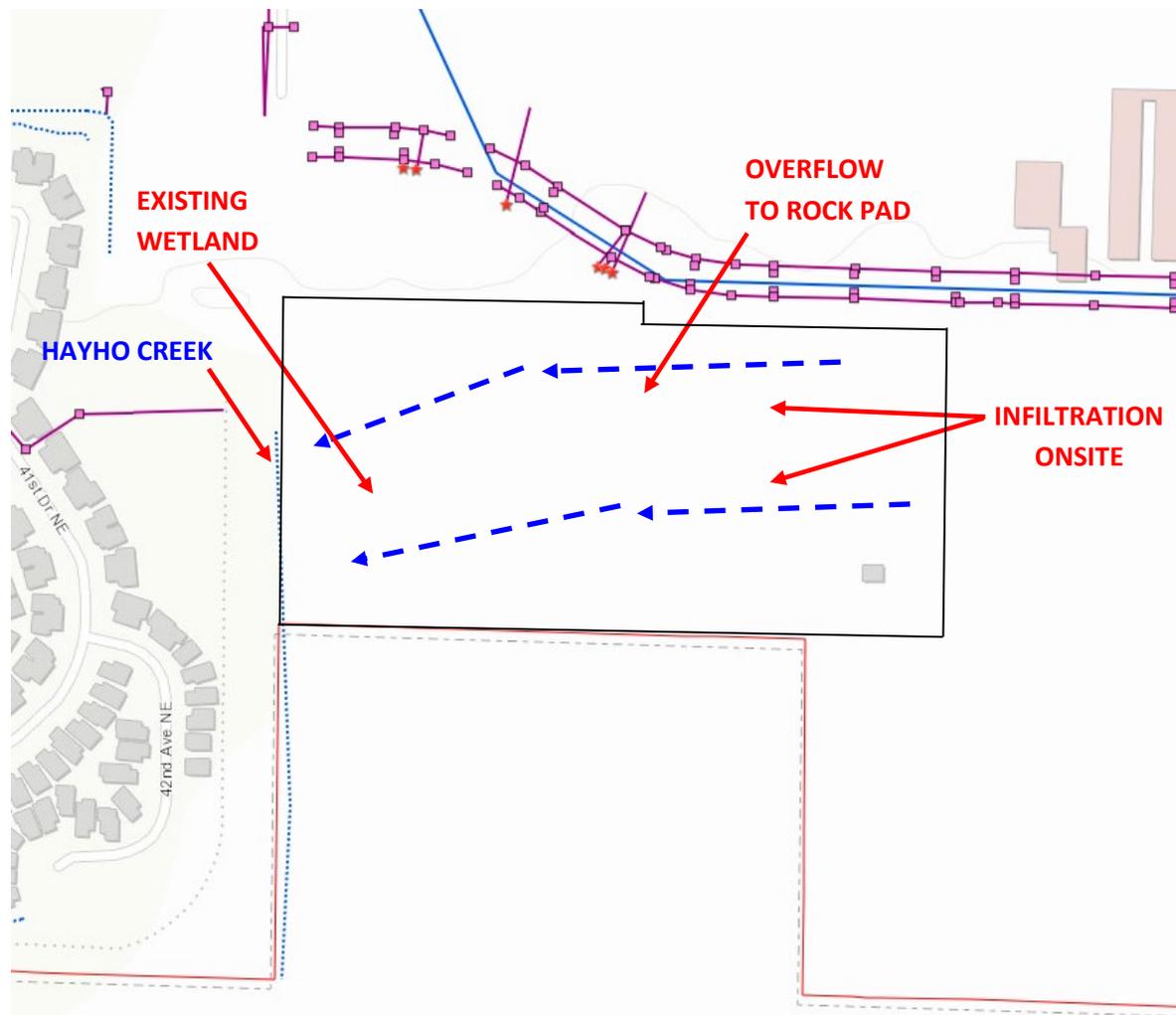
*Task 4 - Describe the drainage system, and its existing and predicted problems*

An off-site analysis will be provided in further stages of the project. When conducted the offsite analysis will be prepared according to Chapter 3 of Volume III of the Drainage Manual. It shall assess the potential off-site water quality, erosion, slope stability, and drainage impacts associated with the project and propose appropriate mitigation of those impacts. An initial qualitative analysis shall extend downstream for the entire flow path from the project site to the receiving water or up to one mile, whichever is less. If a receiving waterbody is within one-quarter mile, the analysis shall extend within the receiving water to one-quarter mile from the project site. The below offsite analysis has been estimated per available GIS maps and data.

### **Task 1 – Define and map the study area**

Development projects that discharge stormwater off-site shall submit an off-site analysis report that assesses the potential off-site water quality, erosion, slope stability, and drainage impacts associated with the project and proposes appropriate mitigation of those impacts. An initial qualitative analysis shall extend downstream for the entire flow path from the project site to the receiving water or up to one mile, whichever is less. A site visit with a downstream walk will be completed in the engineering construction documents stage. The following downstream analysis consists of GIS and topographic maps.

All runoff from developed areas will be directed to infiltration trenches designed to infiltrate 100% of contributing runoff. The infiltration trenches are designed to infiltrate 100% and the western infiltration trench has been designed with the overflow discharge pipe to rock pad. The overflow paths will be studied in this section.



**Figure III-1 Study Area from Arlington, Wa Utilities Map**

Figure III- 1 depicts the downstream flow path from the site. Existing drainage flows in a westerly direction which is intercepted by the onsite wetland and HAYO Creek which outfalls into the Possession Sound (Puget Sound).

***Task 2 – Review all available information on the study area***

The predeveloped site was developed with an existing SFR, garage and associated patio and driveway areas. The vegetation onsite consists of pasture, wetland and associated buffers, and forested areas along the south side of the site. The site does not contain any stormwater improvements. Existing stormwater infrastructure in the adjacent streets was determined from the survey, field inspection and the City's online maps.

The site is within the Hayho Creek/Quilceda Creek sub-drainage basin and Snohomish Watershed which outlets to the Possession Sound.

Snohomish County drainage GIS map and the City of Arlington Utility GIS map show portions of the upstream and downstream drainage conveyance. A Critical Areas Study was conducted by Soundview Consultants, Inc. and it was found that a category II wetland exists on the west side of the site. Additionally, Hayo Creek exists in the southwest portion of the site. DOE's Water Quality Atlas was reviewed, and Hayho Creek has no category 5 listings for Bioassessment and a water quality standard for Freshwater salmonid habitat. Figure III-3 shows the highlighted portion from the atlas.



**Figure III-2. DOE's Water Quality Atlas showing downstream flow path. The thick purple line represents a water quality standard: Freshwater core summer salmonid habitat.**

<https://apps.ecology.wa.gov/waterqualityatlas/wqa/map>

### **Task 2.1 – Upstream Flows**

There are no concentrated flows that enter the site according to aerial imagery and available GIS mapping data. Hayo Creek runs along the southwest corner of the property. See Critical Area Study.

The existing upstream flows consist of minor sheet flow from 168<sup>th</sup> Street NE that is located to the north of the site, and adjacent properties to the east of the site.

### **Task 2.2 – Downstream Flows**

The area of development on the site is generally the portion of the property which flows westerly toward the onsite wetland. The infiltration trenches on site are being designed to infiltrate 100% of contributing runoff.

The infiltration trenches are designed to infiltrate all the contributing runoff and continue along the natural drainage path to the west. Stormwater arrives at Hayho Creek (along the natural drainage path) via infiltration and subsurface flow.

Hahyo Creek continues to flow in a southerly direction for approximately 0.89 miles until it enters a culvert and flows in a southerly direction beneath 152<sup>nd</sup> Street NE. HAYO Creek then eventually outfalls into the Possession Sound (Puget Sound).

### **Task 3 – Field inspect the study area**

A site visit with a downstream walk will be completed in the engineering construction documents stage.

### **Task 4 – Describe the drainage system, and its existing and predicted problems**

The drainage system is described in Task 2. There are no predicted problems within the system.



Figure III-3 Photo Taken from 168<sup>th</sup>, looking south toward the site.

## Section IV – Permanent Stormwater Control Plan

### Section IV Summary

*On-Site Stormwater Management*

*Runoff Treatment*

*Flow Control*

*Source Control*

The proposed site preliminarily consists of one drainage basin which is routed to a series of several infiltration trenches spaced throughout the project. The site meets the Low Impact Development (LID) Performance standard and the Flow Control Standard by 100% infiltrating the developed runoff.

Water quality is addressed by a treatment layer of amended soil under the infiltration trenches.

The predeveloped (forested) and developed land cover used in the WWHM model is as follows. See Appendix A for more detail within the WWHM report.

The proposed lot coverage is as follows:

#### *Pervious Areas*

|                            |                  |
|----------------------------|------------------|
| Wetland and buffer:        | 412,585 sf       |
| <u>Pasture, Flat, A/B:</u> | <u>74,164 sf</u> |
| Total:                     | 486,749 sf       |

#### *Impervious Areas Onsite*

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**Total Area to Infiltration Trenches: 381,965 sf (8.769 ac)**

In design, Infiltration was only found to be feasible by raising the site above the shallow perched water and using shallow infiltration trenches. All proposed hard surfaces will be routed to infiltration trenches on-site.

Because the site was raised, an appropriate fill material for underneath the proposed infiltration beds was selected. The infiltration rate used for preliminary design was 0.75 in/hr. per the recommendations in the geotechnical memo. This design rate is to be tested and verified prior to the construction design stage.

WWHM2012 was used to determine the total amount of gravel infiltration trench required to infiltrate 100% of the runoff on site. The total trench area outputted in the WWHM report of was divided into 6 trenches as shown on the construction plans. All designed trenches total an area of 56,250 sf. Catch basins, area drains, and roof drains all connect to the infiltration trenches for on-site stormwater management, flow control, and water quality standard.

#### On-Site Stormwater Management

The project must meet Minimum Requirement #5. Per Table I-3.1 from the SWMMWW, new development projects on any parcel inside the Urban Growth Area that trigger Minimum Requirements #1 through #9 must either:

1. Use On-Site Stormwater Management BMPs from List #2 for all surfaces within each type of surface in List #2; or
2. Demonstrate compliance with the LID Performance Standard and BMP T5.13.

The project proposes to meet the LID Performance Standard and BMP T5.13. The modeling results for the site showing the infiltration area to meet this standard are provided and begin on A-2 in Appendix A.

#### Flow Control

The infiltration trenches were sized in WWHM to infiltrate 100% of the site. When comparing the existing basin to the Predeveloped the Flow Control Duration Standard for Minimum Requirement #7 is met.

Please see the WWHM report in Appendix A for compliance shown. In appendix A is a more specific model of the proposed site basin, breaking the trenches into sections to verify 100% infiltration.

In designing the trenches an important concern was to raise them up enough to avoid issues with the groundwater. Mounding analyses will be provided during the construction design stage of the project. It is important to note that the water level being treated as the layer of concern in the preliminary design is called out as perched water.

The preliminary Infiltration Report dated September 1, 2021 indicates that the regional groundwater was observed at approximately 2-5 feet below the existing grade, which is proposed to be 1.5' below the bottom of the storage.

#### Runoff Treatment

Runoff treatment is required for pollution-generating hard surfaces (PGHS). Per Section I-3.4.6 of Volume I of the SWMMWW, runoff treatment is required since the project proposes more than 5,000 square feet of new/replaced PGIS.

It is possible that the surface soil is suitable for on-site pollutant treatment. However, this soil will not be used in design however, as the perched groundwater could be present. The fill selected for areas

underlying treatment areas has the appropriate cation exchange capacity to treat the stormwater. Oil water separator fittings per City details are included in upstream catch basins collecting pollution generating impervious surfaces to provide pretreatment prior to discharge into the trenches.

56,250 sf of infiltration surface area is provided via 6 large infiltration beds on the site. All the proposed hardscape is proposed to flow to the infiltration facilities and will be filtered for water quality through the designed imported fill as described above. The water quality calculations are to be provided in future phases of the project.

## **Section V – Construction Stormwater Pollution Prevention**

### **Section V Summary**

#### *Narrative*

#### *Calculations*

Erosion control details are provided consistent with the 2019 DOE Manual. Erosion control plan sheets are provided in full size as a part of the civil drawing set.

A Construction Stormwater General Permit (CSGP) is required through the Department of Ecology because land disturbing activities total over one acre. This will be performed roughly on the same timeline as full engineering submittals to the City of Arlington. A summary of the elements is provided below, at that time a full DOE SWPPP report will be provided.

#### **Element 1: Mark Clearing Limits**

To protect adjacent properties and to reduce the area of soil exposed to construction, the limits of construction will be clearly marked before land-disturbing activities begin. Clearing limits will be to the extents of necessary land disturbance. The BMPs relevant to marking the clearing limits that will be applied for this project include:

High Visibility Plastic or Metal Fence (BMP C103)

#### **Element 2: Establish Construction Access**

Construction access or activities occurring on unpaved areas shall be minimized, yet where necessary, access points shall be stabilized to minimize the tracking of sediment onto public roads. Stabilized construction entrances will be added on the west and east south of the site at the locations of the proposed entrances to the apartment complex. This will help to prevent sediment tracking into the right of way.

Stabilized Construction Entrance (BMP C105)

#### **Element 3: Control Flow Rates**

Stormwater will be directed to a temporary sediment pond at the northwest corner of the site, and flow rates will be controlled per the BMPs listed below. The construction of the temporary sediment pond must be done as one of the first steps in grading. Stormwater should not be directed to infiltration facilities until the site has been stabilized. Protect Low Impact Development BMPs from compaction and sedimentation per Element 13.

Temporary Sediment Pond (BMP C241)

Check Dams (C207)

Silt Fence (BMP C233)

#### **Element 4: Install Sediment Controls**

Stormwater must be filtered prior to being discharged to an infiltration system or leaving the construction site. A silt fence will be installed around the entire perimeter of the site. A temporary sediment pond will

be installed at the northwest corner of the site where some sediment will be able to settle out prior to discharge to the public storm system.

If sediment controls are ineffective and turbid water is observed discharging from the site, additional energy dissipation BMPs and sediment control BMPs should be installed such as wattles. It may also be necessary to stabilize soils per Element 5 that are not being worked on. The specific BMPs to be used for controlling sediment on this project include:

Silt Fence (BMP C233)

Temporary Sediment Pond (BMP C241)

Wattles (BMP C235)

#### **Element 5: Stabilize Soils**

Exposed and unworked soils shall be stabilized with the application of effective BMPs to prevent erosion throughout the life of the project. The specific BMPs for soil stabilization that shall be used on this project include:

Temporary and Permanent Seeding (BMP C120)

Mulching (BMP C121)

Nets and Blankets (BMP C122)

Plastic Covering (BMP C123)

Sodding (BMP C124)

Topsoiling/Composting (BMP C125)

Surface Roughening (BMP C130)

Dust Control (BMP C140)

#### **Element 6: Protect Slopes**

Exposed slopes shall be stabilized with BMPs found in Element 5.

#### **Element 7: Protect Drain Inlets**

Drain inlets near the site and those made operable on-site will be protected from sedimentation. Stormwater shall not enter the conveyance system without first being filtered or treated to remove sediment. Inlet protection devices shall be cleaned or removed and replaced when sediment has filled one-third of the available storage (or as specified by the manufacturer). The specific BMPs to be used for protecting drain inlets are:

Storm Drain Inlet Protection (BMP C220)

#### **Element 8: Stabilize Channels and Outlets**

All temporary on-site conveyance channels shall be designed, constructed, and stabilized to prevent erosion during construction. The specific BMPs to be used for are:

Channel Lining (BMP C202)

Check Dams (BMP C207)

Outlet Protection (BMP C209)

### **Element 9: Control Pollutants**

Design, install, implement and maintain effective pollution prevention measures to minimize the discharge of pollutants. The suggested BMPs are:

Concrete Handling (BMP C151)

Saw Cutting and Surfacing Pollution Prevention (BMP C152)

Material Delivery, Storage and Containment (BMP C153)

### **Element 10: Control Dewatering**

De-watering is not anticipated.

### **Element 11: Maintain BMPs**

All temporary and permanent erosion and sediment control BMPs shall be maintained and repaired as needed to ensure continued performance of their intended function.

### **Element 12: Manage the Project**

- Phase development projects to the maximum degree practicable and consider seasonal work limits.
- Inspection and monitoring – Inspect, maintain, and repair all BMPs as needed to assure continued performance of their intended function. Conduct site inspections and monitoring in accordance with the Construction Stormwater General Permit or local plan approval authority.
- Maintain an Updated Construction SWPPP
  - This SWPPP shall be retained on-site or within reasonable access to the site.
  - The SWPPP shall be modified whenever there is a change in the design, construction, operation, or maintenance at the construction site that has, or could have, a significant effect on the discharge of pollutants to waters of the state.
  - The SWPPP shall be modified if, during inspections or investigations conducted by the owner/operator, or the applicable local or state regulatory authority, it is determined that the SWPPP is ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the site. The SWPPP shall be modified as necessary to include additional or modified BMPs designed to correct problems identified. Revisions to the SWPPP shall be completed within seven (7) days following the inspection.

### **Element 13: Protect Low Impact Development BMPs**

Gravel infiltration trenches are proposed throughout the site. All heavy equipment should be kept off infiltration facilities that have been excavated to final grade to retain the infiltration rate of the soil. The proposed trenches shall be protected from compaction during construction with orange protective fencing.

Calculations

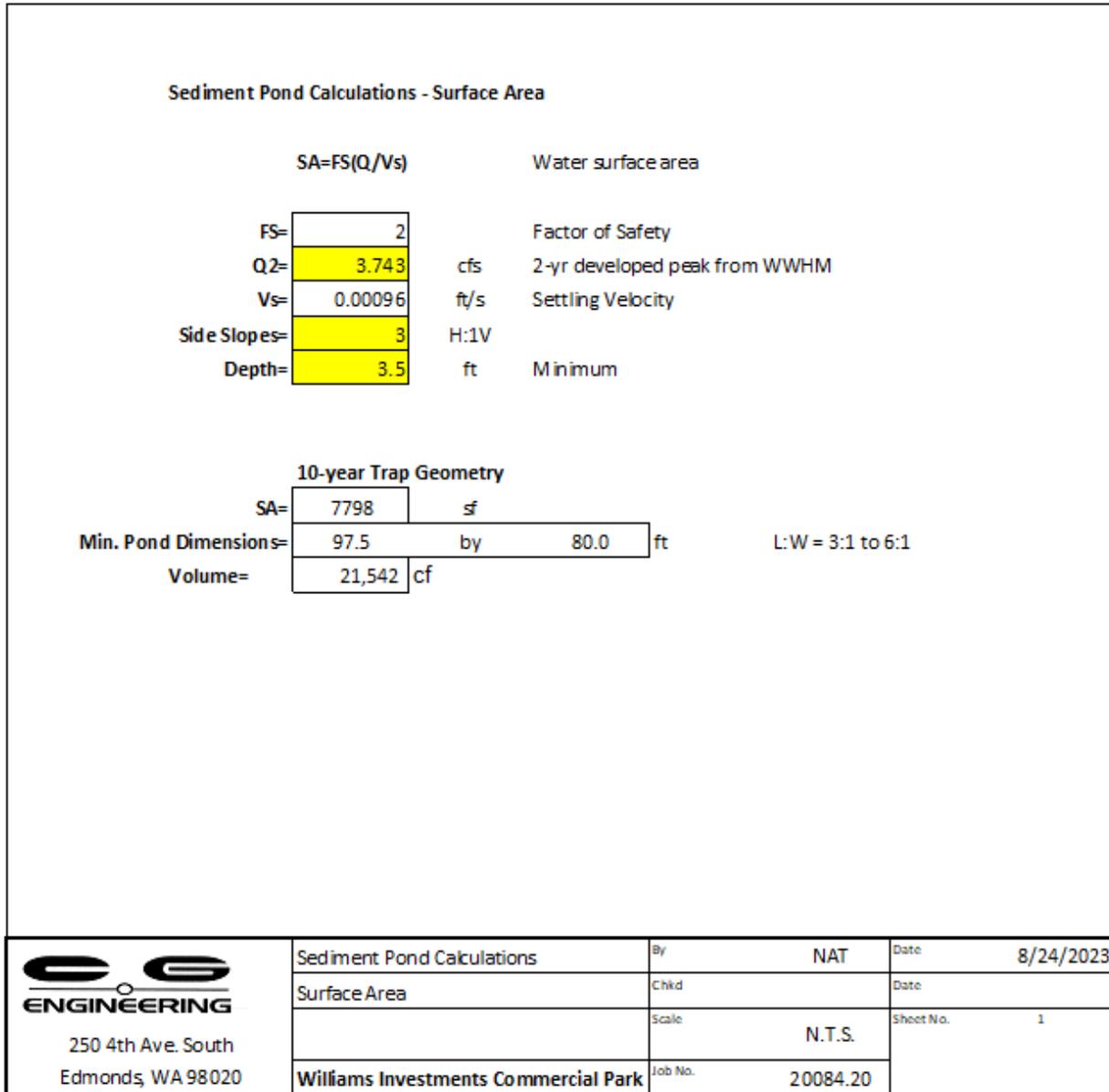


Figure V-1 Sediment Pond Sizing

## **Section VI – Special Reports and/or Studies**

### **Section VI Summary**

#### *Narrative*

The following reports are included in this section:

1. Geotechnical Engineering Memo by GeoEngineers, dated September 1st, 2021.
2. Geotechnical Data Report by GeoEngineers, dated September 11th, 2023.
3. Wetlands Delineation, Groundwater Monitoring, and Fish and Wildlife Habitat Assessment Report by Soundview Consultants dated April 2022.
4. Tree Assessment Report dated September 6<sup>th</sup>, 2023.

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**To:** Ryan Kilby, Williams Investments, LLC

**From:** Aaron Hartvigsen, PE  
J. Gordon, PE

**Date:** September 1, 2021

**File:** 22450-004-00

**Subject:** The Rex Development  
Geotechnical Services – Basis of Design Narrative

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The following is a summary of site conditions and preliminary geotechnical design considerations for the proposed Rex Development project that includes two parcels, one in Maysville and one in Arlington, Washington. The site includes parcel number 31052800400100 (16204 51<sup>st</sup> Avenue NE, Marysville) and parcel number 31052800100700 (16430 51<sup>st</sup> Avenue NE, Arlington). The following is based on communications with the project civil/structural engineer (CG Engineering), our experience at the site and information presented in our geotechnical data report (GDR) of the same date as this memorandum, and our previous experience in the area. We understand that the proposed site development will include light industrial structures, likely one- to two-story concrete tilt-up buildings.

#### Surface and Subsurface Conditions

- **Site Conditions:** the site is predominantly agricultural land gently sloping down to the south. An existing pipeline easement will require special considerations to minimize impacts.
- **Subsurface Conditions:** are described in detail in our GDR. The subsurface conditions generally consist of a surficial reworked agricultural horizon topsoil overlying outwash sand. The sand is typically medium dense and grades to dense in some explorations at depths of approximately 35 to 40 feet bgs.
- **Groundwater:** was encountered during our explorations and is continuing to be monitored. Seasonal high groundwater is anticipated to be within 1 to 2 feet of the existing ground surface.

#### Seismic Considerations

- The site is underlain by liquefiable soils. Based on our preliminary analyses, we determined the potential of 1 to 2 inches of seismically induced settlement of soils within the upper 40 feet, the depth of our explorations. Nearby explorations that extend deeper indicate that additional liquefiable layers may be present up to 70 feet below grade resulting in additional settlement on the order of 3 to 6 inches. The differential effects of the settlement from the soils below 40 feet will be limited based on the medium dense to dense layer encountered in the upper 40 feet. Our preliminary conclusion is that the risk of excessive differential settlement to the proposed light industrial type structures proposed at this site can be mitigated without using deep foundations or ground improvement. However, ground improvement could be used at the site to minimize the risk of total and differential settlement if desirable.
- Based on the anticipated light industrial buildings, standard International Building Code (IBC) design practices will be appropriate. Some structural mitigation of seismic settlement should be considered as discussed below in Building Support.

### Earthwork Considerations

- **Earthwork:** We understand that the design team is considering raising site grades for stormwater management considerations. This will result in elastic settlement of loose granular materials and consolidation settlement of soft silt layers (encountered in TP-1). Grading should take place as early as feasible to allow the settlement to occur prior to building construction. Based on the size of the site, an instrumented test fill could be completed to better estimate magnitude and time rate of settlement that will occur from an aerial fill load.

### Building Support

- **Foundations:** The existing surficial soils are not suitable for support of shallow foundations. Our preliminary conclusion is that shallow foundation design will be appropriate for the building. However, overexcavation and replacement of surficial loose/organic or unsuitable surficial soils will be appropriate. It appears that this will be limited to about 1 to 1½ feet below the existing ground surface. Additionally, to mitigate the effects of liquefaction and increase seismic performance, we recommend the use of grade beams to limit effects of potential differential settlement. If specific structures have tight tolerances or heavy loads, other options such as ground improvement (rammed aggregate piers or rigid inclusions) will be evaluated during the design.
- **Floor Support:** conventional slab-on-grade design can be used, provided the upper 1 to 1½ feet of surficial topsoil layer is removed. Depending on the site use a preload or surcharge program may be necessary to reduce risk of settlement from fine grained areas. We would anticipate that settlement would occur quickly and that the use of rolling surcharges would limit cost of imported surcharge material.

### Temporary/Permanent Shoring

We anticipate that the majority of construction will occur above grade. Below grade elements that extend below the groundwater table including utilities will require temporary shoring and/or dewatering. The sandy soils will run into the excavation when saturated and stability of the hole will be difficult to impossible to maintain.

### Stormwater Considerations

- **Stormwater:** infiltration is not feasible based on the conditions observed without more extensive testing and analysis.
  - For preliminary sizing and analysis of infiltration options at the site we recommend a preliminary allowable design infiltration rate of 0.75 inches per hour. This value is based on review of sieve analyses, and testing and modeling at a similar site within the same watershed.
  - If the site grades are raised the gradation of the material for infiltration areas will be an important consideration, as will removing the existing topsoil layer.
  - We anticipate additional infiltration testing will consist of Pilot Infiltration Testing (PIT) and mounding analysis. The PIT should be conducted in conditions similar to the proposed final grading, such as with raised grades. The PIT work could be coordinated with the test fill discussed in the Earthwork Considerations section above.

- We also expect that a conventional detention vault/tank could be used if needed. The vault would need to include appropriate considerations for uplift for portions that extend below the groundwater table.

### **Limitations**

We have prepared this preliminary memorandum for use by Williams Investments LLC, and other members of the design team for use in planning for the proposed The Rex Development project. This memorandum is not intended for design purposes; a design report will be prepared as the project design proceeds.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted geotechnical practices in this area at the time the memorandum was prepared. No warranty or other conditions express or implied should be understood.

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## **Geotechnical Data Report**

The Rex Development  
Marysville, Washington

*for*  
**Williams Investments LLC**

September 11, 2021



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The Rex Development  
Marysville, Washington

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**Williams Investments LLC**

September 11, 2021



554 West Bakerview Road  
Bellingham, Washington 98226  
360.647.1510

# Geotechnical Data Report

## The Rex Development Marysville, Washington

File No. 22450-004-00

September 11, 2023

Prepared for:

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## 1.0 INTRODUCTION AND SCOPE

GeoEngineers, Inc. (GeoEngineers) is pleased to submit our Geotechnical Data Report for “The Rex Development” industrial area that includes two parcels, one in Maysville and one in Arlington, Washington. The site includes parcel number 31052800400100 (16204 51<sup>st</sup> Avenue NE, Marysville) and parcel number 31052800100700 (16430 51<sup>st</sup> Avenue NE, Arlington). The project is in preliminary planning for new industrial buildings with associated parking and improvements. A vicinity map showing the project location is provided as Figure 1. The existing site conditions and approximate location of the completed explorations are shown in the Site and Exploration Plan, Figure 2.

The purpose of this data report is to present the available geotechnical site information as part of the planning and design development. Geotechnical design recommendations will be provided as the project concept is further developed.

Our complete scope of services is described in our proposal for the project dated March 17, 2021 which was authorized by Ryan Kilby with Williams Investments LLC on the same date. We completed review of available geologic and geotechnical information related to the site, observing test pits and installing shallow piezometers, and subcontracting cone penetrometer tests (CPTs).

## 2.0 SITE CONDITIONS

### 2.1. Geology

Our review of the U.S. Geological Survey map, *Geologic Map of the Arlington West 7.5-Minute Quadrangle Snohomish County, Washington* by James P. Minard indicates that surficial soils at the site consist primarily of recessional outwash deposits of the Marysville Sand Member.

The Marysville Sand Member typically consists of stratified outwash sand with occasional gravel, and isolated areas of silt and clay. The sediments were deposited by meltwater from the stagnating and receding Vashon glacier and are typically medium dense/stiff. We observed recessional outwash deposits in each of the explorations completed on the property.

### 2.2. Surface Conditions

The development area at the site consists of relatively flat agricultural fields. The elevation changes gradually from approximately 115 feet (NAVD 88) at the north to 105 feet at the south, based on reviewing available Light Detection and Ranging (LiDAR) information. Wetlands have been identified in the northwest portion of the site. Various farm roads traverse the site. The site is irregularly shaped consisting of multiple parcels bounded by 51<sup>st</sup> Avenue NE to the east, proposed 156<sup>th</sup> Street NE to the south, proposed 43<sup>rd</sup> Avenue to the west and proposed 168<sup>th</sup> Avenue to the north. Adjacent site uses include residential, retail, rural residential, agricultural, and light industrial. The site is outlined in the attached Figure 2. Existing utilities are typically in adjacent rights-of-way, except for the Olympic pipeline easement which traverses the site at an angle in the southeast/northwest direction.

### 2.3. Subsurface Exploration

Subsurface soil and groundwater conditions were evaluated by reviewing available information including borings from a previous GeoEngineers study in the area, excavating five test pits, and advancing CPTs. The test pits were completed using an excavator provided by the owner on June 11, 2021. The test pits were

completed to depths ranging from 2 to 5 feet below the existing ground surface (bgs), where they were terminated because of caving in saturated sand. Stainless steel drive-point piezometers were installed at the test pit locations to monitor seasonal groundwater levels. Groundwater pressure transducers were installed in the piezometers and will be monitored quarterly through the wet season. Details of the field exploration program, the test pit logs, and laboratory testing are presented in Appendix A. GeoEngineers subcontracted the completion of five CPTs which were completed to depths of 40.4 to 40.9 feet bgs. The CPT logs are presented in Appendix B. The approximate locations of the test pits and CPTs are shown in Figure 2.

## 2.4. Previous Studies

We reviewed GeoEngineers' geotechnical report "156<sup>th</sup> Street NE, 160<sup>th</sup> Street NE and 51<sup>st</sup> Avenue NE Improvements, Marysville, Washington" dated September 11, 2018. The report includes several borings and a monitoring well within or immediately adjacent to the project footprint. The relevant boring logs are also shown in Figure 2 and the logs and laboratory data are included in Appendix C.

## 2.5. Subsurface Conditions

### 2.5.1. Soil Conditions

Subsurface soil conditions generally consisted of a reworked agricultural layer at the surface of overlying outwash sand with isolated silt, consistent with the mapped geology.

**Reworked Agricultural Horizon (Topsoil):** The reworked agricultural surface layer (topsoil) typically consisted of loose brown silty sand with occasional gravel, roots, and rootlets. The agricultural layer extended from the surface to approximately 1 to 1½ feet bgs in the test pits. The CPTs encountered similar surficial conditions indicating loose/soft soil conditions in the upper 2 feet.

**Outwash:** Outwash deposits were observed below the topsoil. The outwash deposits typically consist of fine to medium sand with variable amounts of silt, gravel, and cobbles. The fines content of the outwash deposits typically ranged from 1 to 12 percent with occasional sandy silt interbeds observed in some of the explorations. TP-1 encountered a thicker silt layer between 2 and 4 feet bgs. CPTs recorded increasing resistance below the topsoil and encountered medium dense sand to the full depth explored with increased resistance from approximately 35 to 40 feet in CPT-1, CPT-2, and CPT-5. CPT-2 and CPT-4 encountered a 1-foot-thick layer of stiff silt at 31 and 19 feet, respectively.

### 2.5.2. Groundwater

Groundwater seepage was encountered in all explorations at depths ranging from 2 to 5 feet bgs during test pit excavation and interpreted to range between 1.2 and 1.9 feet in the CPT explorations. Groundwater was typically encountered within the outwash sand material. Based on observations of iron staining in the soil samples, and our understanding of groundwater fluctuation in the project vicinity, we expect that groundwater could rise to near the ground surface during wetter portions of the year. Our explorations were not left open long enough to allow groundwater to stabilize. Rapid groundwater seepage and caving was observed in the outwash deposits during the short time period the test pits were left open.

To determine seasonal groundwater fluctuations and water levels, we installed stainless steel drive-point piezometers and pressure transducers. We will continue to monitor the piezometers quarterly. The data from the recent groundwater monitoring event are presented in Figure 3. The groundwater is influenced by season, precipitation, and other factors.

### **3.0 LIMITATIONS**

We have prepared this geotechnical data report for use by Williams Investments LLC, and other members of the design team for use in planning and permitting for the proposed The Rex Development project. This report is not intended for design purposes; design recommendations will be provided under separate cover.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted geotechnical practices in this area at the time the report was prepared. No warranty or other conditions express or implied should be understood.

Any electronic form, facsimile, or hard copy of the original document (email, text, table, and/or figure), if provided, and any attachments are only a copy of the original document. The original document is stored by GeoEngineers, Inc. and will serve as the official document of record.

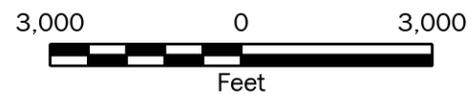
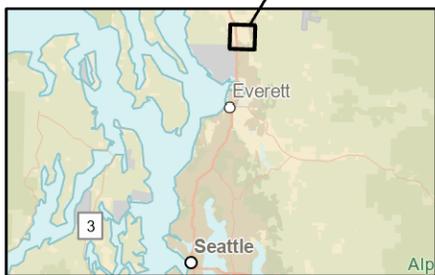
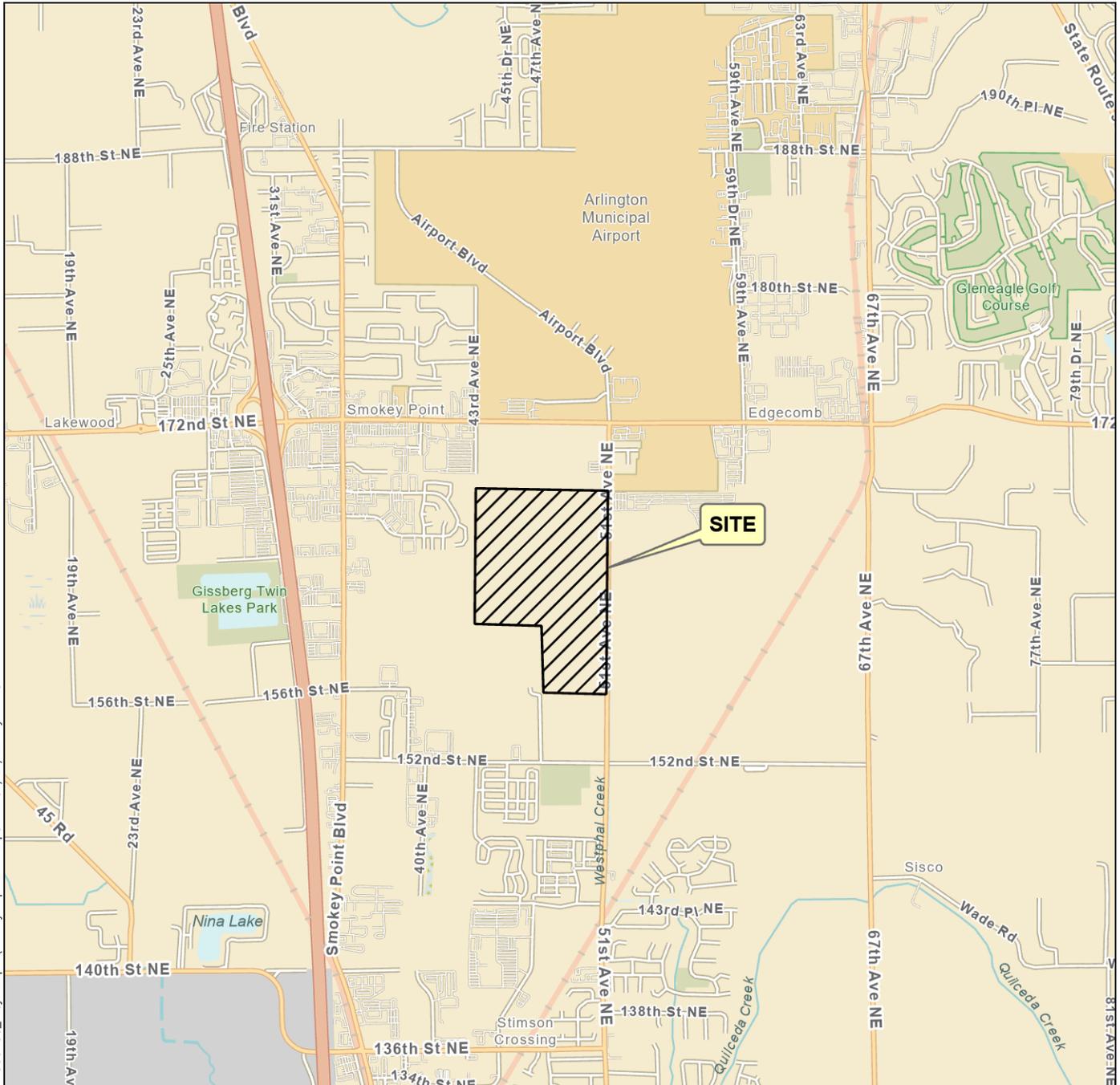
See Appendix D for additional information regarding the limitations.

### **4.0 REFERENCES**

GeoEngineers, 2018. "Geotechnical Engineering Services, 156<sup>th</sup> Street NE, 160<sup>th</sup> Street NE and 51<sup>st</sup> Avenue NE Improvements, Marysville, Washington", dated September 11, 2018.

Minard, James P. 1985. "Geologic Map of the Arlington West 7.5 Minute Quadrangle, Snohomish County, Washington" Department of the Interior, U.S. Geological Survey. Miscellaneous Field Studies Map MF-1740.





**Vicinity Map**

The Rex Development  
Marysville, Washington



**Figure 1**

**Notes:**

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: ESRI

Projection: NAD 1983 UTM Zone 10N

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\\geoengineers.com\WAN\Projects\22\_22450004\CAD\00\Geotech\2245000400\_F02\_Site Plan.dwg TAB:F02 Date Exported: 09/01/21 - 11:10 by byrd



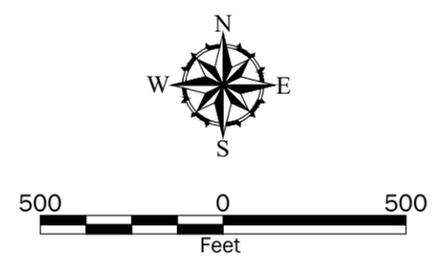
**Legend**

- TP-1 Test Pit by GeoEngineers, Inc., 2021
- CPT-1 Cone Penetrometer Test by GeoEngineers, Inc., 2021
- B-3 Boring by GeoEngineers, Inc., 2021
- Site Boundary

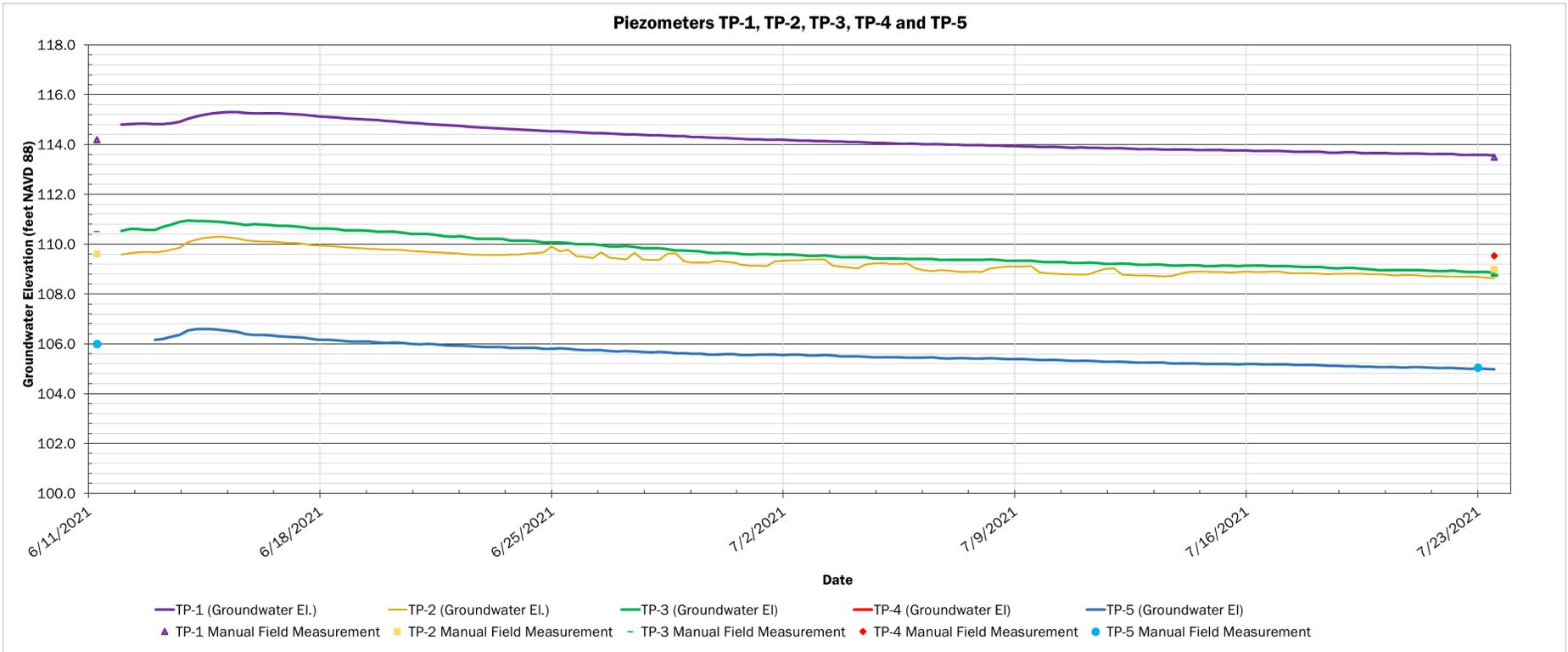
**Notes:**

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Background Aerial from Microsoft Bing  
 Projection: Washington State Plane, North Zone, NAD83, US Foot



|   |                 |
|---|-----------------|
| <b>Site Plan</b>                              |                 |
| The Rex Development<br>Marysville, Washington |                 |
|   | <b>Figure 2</b> |



**Notes:**

1. The locations of all features shown are approximate.
  2. TP-4 damaged during initial installation; Replacement installed with transducer on July 23, 2021.
  3. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document.
- GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

|  |                 |
|--|-----------------|
| <b>Groundwater Monitoring Data<br/>Piezometers TP-1 through TP-5</b> |                 |
| The Rex Development<br>Marysville, Washington                        |                 |
|  | <b>Figure 3</b> |



**APPENDIX A**  
**Field Explorations and Laboratory Testing**

## **APPENDIX A FIELD EXPLORATIONS AND LABORATORY TESTING**

### **Field Explorations**

Subsurface conditions were evaluated by completing five test pits (TP-1 through TP-5) on June 11, 2021 and subcontracting cone penetrometer tests (CPTs). The test pit excavations were completed to depths ranging from approximately 2 to 5 feet below the existing ground surface (bgs) by using a mini excavator provided by the owner. The CPT drill rig was subcontracted to GeoEngineers. The locations of the explorations are shown in the Site and Exploration Plan, Figure 2. The locations of the explorations were determined by iPad global positioning system (GPS) and were monitored by a geologist from our firm. The locations should be considered accurate to the degree implied by the method used. Ground surface elevations were estimated based on publicly available Light Detection and Ranging (LiDAR) topography information.

Disturbed soil samples were generally obtained from the sides of the test pits and the bucket of the excavator. The samples were placed in plastic bags to maintain the moisture content and transported back to our laboratory for analysis and testing. The test pits were backfilled with the excavated material upon completion and tamped with the excavator bucket.

The soil test pits were continuously monitored by a geologist from our firm who examined and classified the soils encountered, obtained representative soil samples, observed groundwater conditions, and prepared a detailed log of each exploration. Soils were visually classified in general accordance with ASTM International (ASTM) D-2488-90, which is described in Figure A-1. An explanation of our exploration log symbols is also shown in Figure A-1.

The logs of the test pits completed for the geotechnical evaluation are presented in the attached figures. The exploration logs are based on our interpretation of the field and laboratory data and indicate the various types of soils encountered. They also indicate the depths at which these soils or their characteristics change, although the change might be gradual. If the change occurred between samples in the borings the depth was inferred.

The CPT exploration methodology and logs are presented in Appendix B. Some additional borings completed near the site are presented in Appendix C.

### **Laboratory Testing**

Soil samples obtained from the explorations were transported to our laboratory and examined to confirm or modify field classifications, as well as to evaluate index properties of the soil samples. Representative samples were selected for laboratory testing consisting of the determination of the moisture and fines contents. The tests were performed in general accordance with test methods of ASTM or other applicable procedures.

### **Moisture Content Testing**

Moisture content tests were completed in general accordance with ASTM D 2216 for representative samples obtained from the explorations. The results of these tests are presented on the exploration logs at the depths at which the samples were obtained.

### **Percent Passing U.S. No. 200 Sieve**

Selected samples were “washed” through the U.S. No. 200 mesh sieve to determine the relative percentage of coarse- and fine-grained particles in the soil. The percent passing value represents the percentage by weight of the sample finer than the U.S. No. 200 sieve. These tests were conducted to verify field descriptions and to determine the fines content for analysis purposes. The tests were conducted in general accordance with ASTM D 1140, and the results are shown on the exploration logs in Appendix A at the representative sample depths.

### **Sieve Analyses**

Sieve analyses were performed on selected samples in general accordance with ASTM D 422 to determine the sample grain-size distribution. The wet sieve analysis method was used to determine the percentage of soil greater than the U.S. No. 200 mesh sieve. The results of the sieve analyses were plotted, classified in general accordance with the Unified Soil Classification System (USCS), and are presented in Figure A-7.

### **Atterberg Limits**

Atterberg limits were performed on selected samples in general accordance with ASTM D 4318 to determine the plasticity index and liquid limit of clay. The results of the Atterberg limit analyses were plotted and classified in general accordance with USCS and are presented in Figure A-8.

## SOIL CLASSIFICATION CHART

| MAJOR DIVISIONS      |                           |  | SYMBOLS |           | TYPICAL DESCRIPTIONS  |
|----------------------|---------------------------|--|---------|-----------|---|
|                      |                           |  | GRAPH   | LETTER    |   |
| COARSE GRAINED SOILS | GRAVEL AND GRAVELLY SOILS | CLEAN GRAVELS<br><small>(LITTLE OR NO FINES)</small>               |         | <b>GW</b> | WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES   |
|                      |                           | GRAVELS WITH FINES<br><small>(APPRECIABLE AMOUNT OF FINES)</small> |         | <b>GP</b> | POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES   |
|                      |                           | GRAVELS WITH FINES<br><small>(APPRECIABLE AMOUNT OF FINES)</small> |         | <b>GM</b> | SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES  |
|                      | SAND AND SANDY SOILS      | CLEAN SANDS<br><small>(LITTLE OR NO FINES)</small>                 |         | <b>SW</b> | WELL-GRADED SANDS, GRAVELLY SANDS   |
|                      |                           | SANDS WITH FINES<br><small>(APPRECIABLE AMOUNT OF FINES)</small>   |         | <b>SP</b> | POORLY-GRADED SANDS, GRAVELLY SAND  |
|                      |                           | SANDS WITH FINES<br><small>(APPRECIABLE AMOUNT OF FINES)</small>   |         | <b>SM</b> | SILTY SANDS, SAND - SILT MIXTURES   |
| FINE GRAINED SOILS   | SILTS AND CLAYS           | LIQUID LIMIT LESS THAN 50  |         | <b>ML</b> | INORGANIC SILTS, ROCK FLOUR, CLAYEY SILTS WITH SLIGHT PLASTICITY                                  |
|                      |                           | LIQUID LIMIT LESS THAN 50  |         | <b>CL</b> | INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS |
|                      |                           | LIQUID LIMIT LESS THAN 50  |         | <b>OL</b> | ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY   |
|                      | SILTS AND CLAYS           | LIQUID LIMIT GREATER THAN 50                                       |         | <b>MH</b> | INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS SILTY SOILS  |
|                      |                           | LIQUID LIMIT GREATER THAN 50                                       |         | <b>CH</b> | INORGANIC CLAYS OF HIGH PLASTICITY  |
|                      |                           | LIQUID LIMIT GREATER THAN 50                                       |         | <b>OH</b> | ORGANIC CLAYS AND SILTS OF MEDIUM TO HIGH PLASTICITY  |
| HIGHLY ORGANIC SOILS |                           |  |         | <b>PT</b> | PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS   |

NOTE: Multiple symbols are used to indicate borderline or dual soil classifications

### Sampler Symbol Descriptions

|  |                                 |
|--|---------------------------------|
|  | 2.4-inch I.D. split barrel      |
|  | Standard Penetration Test (SPT) |
|  | Shelby tube                     |
|  | Piston                          |
|  | Direct-Push                     |
|  | Bulk or grab                    |
|  | Continuous Coring               |

Blowcount is recorded for driven samplers as the number of blows required to advance sampler 12 inches (or distance noted). See exploration log for hammer weight and drop.

"P" indicates sampler pushed using the weight of the drill rig.

"WOH" indicates sampler pushed using the weight of the hammer.

NOTE: The reader must refer to the discussion in the report text and the logs of explorations for a proper understanding of subsurface conditions. Descriptions on the logs apply only at the specific exploration locations and at the time the explorations were made; they are not warranted to be representative of subsurface conditions at other locations or times.

## ADDITIONAL MATERIAL SYMBOLS

| SYMBOLS |            | TYPICAL DESCRIPTIONS       |
|---------|------------|----------------------------|
| GRAPH   | LETTER     |                            |
|         | <b>AC</b>  | Asphalt Concrete           |
|         | <b>CC</b>  | Cement Concrete            |
|         | <b>CR</b>  | Crushed Rock/Quarry Spalls |
|         | <b>SOD</b> | Sod/Forest Duff            |
|         | <b>TS</b>  | Topsoil                    |

### Groundwater Contact



Measured groundwater level in exploration, well, or piezometer



Measured free product in well or piezometer

### Graphic Log Contact



Distinct contact between soil strata



Approximate contact between soil strata

### Material Description Contact



Contact between geologic units



Contact between soil of the same geologic unit

### Laboratory / Field Tests

|      |  |
|------|--|
| %F   | Percent fines                          |
| %G   | Percent gravel                         |
| AL   | Atterberg limits                       |
| CA   | Chemical analysis                      |
| CP   | Laboratory compaction test             |
| CS   | Consolidation test                     |
| DD   | Dry density                            |
| DS   | Direct shear                           |
| HA   | Hydrometer analysis                    |
| MC   | Moisture content                       |
| MD   | Moisture content and dry density       |
| Mohs | Mohs hardness scale                    |
| OC   | Organic content                        |
| PM   | Permeability or hydraulic conductivity |
| PI   | Plasticity index                       |
| PL   | Point load test                        |
| PP   | Pocket penetrometer                    |
| SA   | Sieve analysis                         |
| TX   | Triaxial compression                   |
| UC   | Unconfined compression                 |
| VS   | Vane shear                             |

### Sheen Classification

|    |                  |
|----|------------------|
| NS | No Visible Sheen |
| SS | Slight Sheen     |
| MS | Moderate Sheen   |
| HS | Heavy Sheen      |

## Key to Exploration Logs



Figure A-1

|                        |           |                  |         |                   |                      |           |                   |  |  |
|------------------------|-----------|------------------|---------|-------------------|----------------------|-----------|-------------------|--|--|
| Date Excavated         | 6/11/2021 | Total Depth (ft) | 5       | Logged By         | JES                  | Excavator | Taylor Excavating | See "Remarks" section for groundwater observed |  |
|                        |           |                  |         | Checked By        | AJH                  | Equipment |                   | See "Remarks" section for caving observed      |  |
| Surface Elevation (ft) | 118       | Easting (X)      | 1314305 | Coordinate System | WA State Plane North |           |                   |  |  |
| Vertical Datum         | NAVD88    | Northing (Y)     | 421399  | Horizontal Datum  | NAD83 (feet)         |           |                   |  |  |

| Elevation (feet) | Depth (feet) | SAMPLE         |                     | Graphic Log | Group Classification | MATERIAL DESCRIPTION  | Moisture Content (%) | Fines Content (%) | REMARKS                                     |
|------------------|--------------|----------------|---------------------|-------------|----------------------|---|----------------------|-------------------|---|
|                  |              | Testing Sample | Sample Name Testing |             |                      |   |                      |                   |   |
| 117              | 1            | 1              | MC                  |             | SM                   | Dark brown fine to medium silty sand with occasional gravel and rootlets (loose, moist) (topsoil) | 30                   |                   |   |
| 116              | 2            | 2              | %F                  |             | SP                   | Gray fine to medium sand with occasional gravel (medium dense, moist) (outwash)                   | 10                   | 7                 |   |
| 115              | 3            | 3              | AL                  |             | MH                   | Yellow elastic silt with occasional gravel (soft, moist)  | 49                   |                   | LL=58; PI=25                                |
| 114              | 4            | 4              | %F                  |             | SP                   | Gray fine to medium sand with occasional gravel (medium dense, wet)                               | 33                   | 2                 | Slight caving observed at 4 feet            |
| 113              | 5            |                |                     |             |                      |   |                      |                   | Slow groundwater seepage observed at 5 feet |

Date: 8/31/21 Path: \\GEOENGINEERS.COM\WAK\PROJECTS\22-22450004\GINT\2245000400.GPJ DBL\Library\Library\GEOENGINEERS\_DF\_STD\_US\_JUNE\_2017.GLB\GER\_TESTPIT\_1P\_GEODEC\_%F

Notes: See Figure A-1 for explanation of symbols.  
 The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 1/2 foot.  
 Coordinates Data Source: Horizontal approximated based on USGS Topo. Vertical approximated based on USGS Topo.

### Log of Test Pit TP-1



Project: The Rex Development  
 Project Location: Marysville, Washington  
 Project Number: 22450-004-00

Figure A-2  
 Sheet 1 of 1

|                        |           |                  |   |              |         |           |                   |  |  |
|------------------------|-----------|------------------|---|--------------|---------|-----------|-------------------|--|--|
| Date Excavated         | 6/11/2021 | Total Depth (ft) | 5 | Logged By    | JES     | Excavator | Taylor Excavating | See "Remarks" section for groundwater observed |  |
|                        |           |                  |   | Checked By   | AJH     | Equipment |                   | See "Remarks" section for caving observed      |  |
| Surface Elevation (ft) | 113       |                  |   | Easting (X)  | 1314172 |           | Coordinate System | WA State Plane North                           |  |
| Vertical Datum         | NAVD88    |                  |   | Northing (Y) | 419785  |           | Horizontal Datum  | NAD83 (feet)                                   |  |

| Elevation (feet) | Depth (feet) | SAMPLE         |                     | Group Classification | MATERIAL DESCRIPTION  | Moisture Content (%) | Fines Content (%) | REMARKS                                      |
|------------------|--------------|----------------|---------------------|----------------------|---|----------------------|-------------------|--|
|                  |              | Testing Sample | Sample Name Testing |                      |   |                      |                   |  |
| 112              | 1            | 1              |                     | SM                   | Dark brown fine to medium sand with occasional gravel and rootlets (loose, moist) (topsoil)     |                      |                   |  |
|                  |              |                |                     | SP-SM                | Light brown fine to medium sand with silt and occasional gravel (medium dense, moist) (outwash) |                      |                   |  |
| 111              | 2            | 2              | %F                  | SM                   | Gray silty fine to medium sand with occasional gravel (medium dense, moist)                     | 27                   | 22                |  |
| 110              | 3            |                |                     |                      |   |                      |                   |  |
| 109              | 4            |                |                     | SP                   | Gray fine to medium sand with gravel (medium dense, wet)  |                      |                   | Severe caving observed from 4 to 5 feet      |
| 108              | 5            |                | %A                  |                      |   | 8                    | 1                 | Rapid groundwater seepage observed at 5 feet |

Date: 8/31/21 Path: \\GEOENGINEERS.COM\WAK\PROJECTS\22-22450004\GINT\2245000400.GPJ DBL\Library\Library\GEOENGINEERS\_DF\_STD\_US\_JUNE\_2017.GLB\GER\_TESTPIT\_LP\_GEOtec\_%F

Notes: See Figure A-1 for explanation of symbols.  
 The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 1/2 foot.  
 Coordinates Data Source: Horizontal approximated based on USGS Topo. Vertical approximated based on USGS Topo.

### Log of Test Pit TP-2



Project: The Rex Development  
 Project Location: Marysville, Washington  
 Project Number: 22450-004-00

Figure A-3  
 Sheet 1 of 1

|                                       |            |                          |                |                                    |                                   |           |                   |  |
|---------------------------------------|------------|--------------------------|----------------|------------------------------------|-----------------------------------|-----------|-------------------|--|
| Date Excavated                        | 6/11/2021  | Total Depth (ft)         | 2.5            | Logged By                          | JES                               | Excavator | Taylor Excavating | See "Remarks" section for groundwater observed |
|                                       |            |                          |                | Checked By                         | AJH                               | Equipment |                   | See "Remarks" section for caving observed      |
| Surface Elevation (ft) Vertical Datum | 112 NAVD88 | Easting (X) Northing (Y) | 1315128 419885 | Coordinate System Horizontal Datum | WA State Plane North NAD83 (feet) |           |                   |  |

| Elevation (feet) | Depth (feet) | SAMPLE         |                     | Group Classification | MATERIAL DESCRIPTION  | Moisture Content (%) | Fines Content (%) | REMARKS  |
|------------------|--------------|----------------|---------------------|----------------------|---|----------------------|-------------------|--|
|                  |              | Testing Sample | Sample Name Testing |                      |   |                      |                   |  |
| 111              | 1            |                | 1 MC                | SM                   | Brown fine to medium silty sand with occasional gravel (loose, moist) (topsoil)           | 18                   |                   |  |
| 110              | 2            |                | 2 %F                | SP                   | Light brown/gray fine to medium sand with occasional gravel (medium dense, wet) (outwash) | 28                   | 4                 | Slight caving observed from 2 to 2.4 feet<br><br>Slow groundwater seepage observed at 2.4 feet |

Notes: See Figure A-1 for explanation of symbols.  
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 1/2 foot.  
Coordinates Data Source: Horizontal approximated based on USGS Topo. Vertical approximated based on USGS Topo.

### Log of Test Pit TP-3



Project: The Rex Development  
Project Location: Marysville, Washington  
Project Number: 22450-004-00

Figure A-4  
Sheet 1 of 1

Date: 8/31/21 Path: \\GEOENGINEERS.COM\WORK\PROJECTS\22-22450004\GINT\22450004000.GPJ DBLlibrary\Library\GEOENGINEERS\_DF\_STD\_US\_JUNE\_2017.GLB\GER\_TESTPIT\_IP\_GEOtec\_%F

|                        |           |                  |         |                   |                      |           |                   |  |  |
|------------------------|-----------|------------------|---------|-------------------|----------------------|-----------|-------------------|--|--|
| Date Excavated         | 6/11/2021 | Total Depth (ft) | 2       | Logged By         | JES                  | Excavator | Taylor Excavating | See "Remarks" section for groundwater observed |  |
|                        |           | Checked By       | AJH     | Equipment         |                      |           |                   | Caving not observed                            |  |
| Surface Elevation (ft) | 112       | Easting (X)      | 1315954 | Coordinate System | WA State Plane North |           |                   |  |  |
| Vertical Datum         | NAVD88    | Northing (Y)     | 418933  | Horizontal Datum  | NAD83 (feet)         |           |                   |  |  |

| Elevation (feet) | Depth (feet) | SAMPLE         |                     | Graphic Log | Group Classification | MATERIAL DESCRIPTION  | Moisture Content (%) | Fines Content (%) | REMARKS                                     |
|------------------|--------------|----------------|---------------------|-------------|----------------------|---|----------------------|-------------------|---|
|                  |              | Testing Sample | Sample Name Testing |             |                      |   |                      |                   |   |
| 111              | 1            |                | 1 %F                |             | SM                   | Dark brown fine to medium silty sand with occasional gravel and rootlets (loose, moist) (topsoil) | 26                   | 22                |   |
| 110              | 2            |                | 2 %F                |             | SP                   | Brown-gray fine to medium sand with occasional gravel (medium dense, wet) (outwash)               | 23                   | 7                 | Slow groundwater seepage observed at 2 feet |

Notes: See Figure A-1 for explanation of symbols.  
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 1/2 foot.  
Coordinates Data Source: Horizontal approximated based on USGS Topo. Vertical approximated based on USGS Topo.

### Log of Test Pit TP-4



Project: The Rex Development  
Project Location: Marysville, Washington  
Project Number: 22450-004-00

Figure A-5  
Sheet 1 of 1

Date: 8/31/21 Path: \\GEOENGINEERS.COM\WAK\PROJECTS\22-22450004\GINT\2245000400.GPJ DBL\Library\Library\GEOENGINEERS\_DF\_STD\_US\_JUNE\_2017.GLB\GER\_TESTPIT\_IP\_GEOtec\_%F

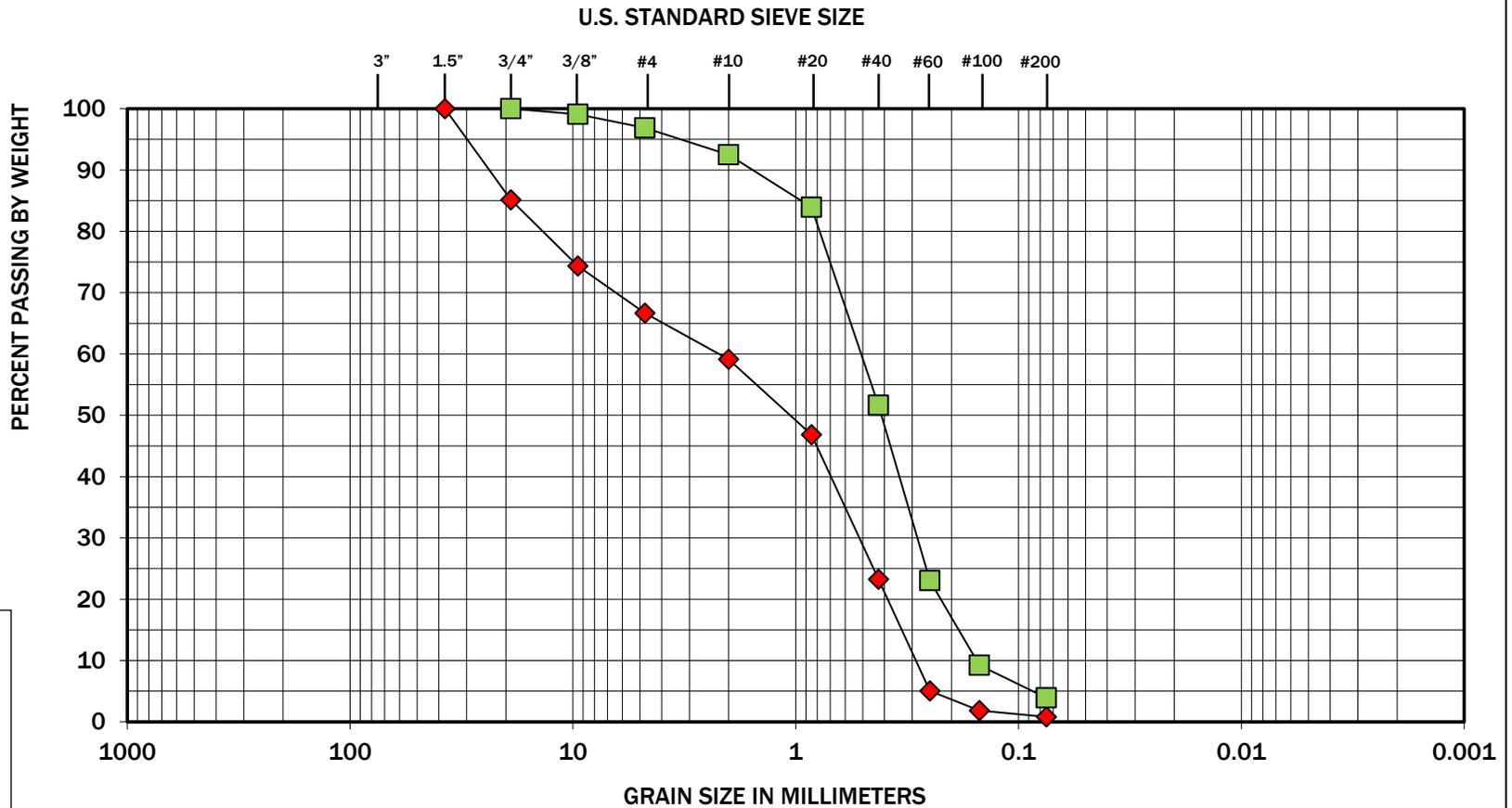
|                        |           |                  |         |                   |                      |           |                   |  |  |
|------------------------|-----------|------------------|---------|-------------------|----------------------|-----------|-------------------|--|--|
| Date Excavated         | 6/11/2021 | Total Depth (ft) | 5       | Logged By         | JES                  | Excavator | Taylor Excavating | See "Remarks" section for groundwater observed |  |
|                        |           |                  |         | Checked By        | AJH                  | Equipment |                   | See "Remarks" section for caving observed      |  |
| Surface Elevation (ft) | 110       | Easting (X)      | 1315523 | Coordinate System | WA State Plane North |           |                   |  |  |
| Vertical Datum         | NAVD88    | Northing (Y)     | 417824  | Horizontal Datum  | NAD83 (feet)         |           |                   |  |  |

| Elevation (feet) | Depth (feet) | SAMPLE         |                     | Graphic Log | Group Classification | MATERIAL DESCRIPTION   | Moisture Content (%) | Fines Content (%) | REMARKS   |
|------------------|--------------|----------------|---------------------|-------------|----------------------|--|----------------------|-------------------|---|
|                  |              | Testing Sample | Sample Name Testing |             |                      |  |                      |                   |   |
| 108              | 1            | 1 MC           |                     | SOD         | SM                   | 2 inches of sod<br>Red-brown fine to medium silty sand with occasional gravel (loose, moist) (topsoil) | 28                   |                   |   |
| 108              | 2            | 2 SA           |                     |             | SP                   | Light brown fine to medium sand with gravel  | 12                   | 4                 |   |
| 105              | 5            | 5 F            |                     |             |                      | Becomes wet and gray with increased gravel content   | 15                   | 1                 | Slight caving observed from 4½ to 5 feet<br>Moderate groundwater seepage observed at 5 feet |

Date: 8/31/21 Path: \\GEOENGINEERS.COM\WAK\PROJECTS\22-22450004\GINT\2245000400.GPJ DBL\Library\Library\GEOENGINEERS\_DF\_STD\_US\_JUNE\_2017.GLB\GER\_TESTPIT\_TP\_5.GEOTEC.%F

Notes: See Figure A-1 for explanation of symbols.  
 The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.  
 Coordinates Data Source: Horizontal approximated based on USGS Topo. Vertical approximated based on USGS Topo.

|   |  |                            |
|---|--|----------------------------|
| <b>Log of Test Pit TP-5</b>   |  |                            |
|  | Project: The Rex Development             | Figure A-6<br>Sheet 1 of 1 |
|   | Project Location: Marysville, Washington |                            |
|   | Project Number: 22450-004-00             |                            |



| COBBLES | GRAVEL |      | SAND   |        |      | SILT OR CLAY |
|---------|--------|------|--------|--------|------|--------------|
|         | COARSE | FINE | COARSE | MEDIUM | FINE |              |

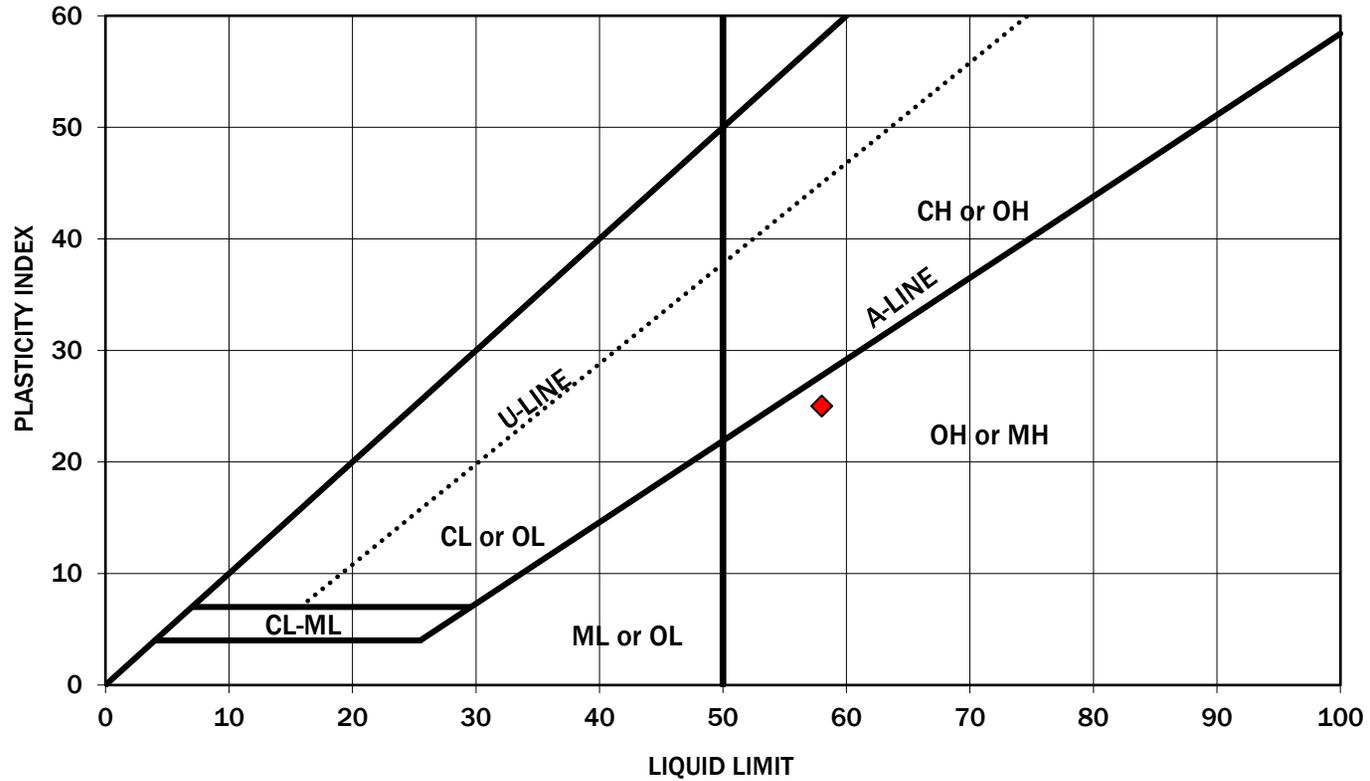
| Symbol | Boring Number | Depth (feet) | Moisture (%) | Soil Description                    |
|--------|---------------|--------------|--------------|-------------------------------------|
| ◆      | TP-2          | 5            | 8.0          | Poorly graded sand with gravel (SP) |
| ■      | TP-5          | 2            | 12           | Poorly graded sand (SP)             |

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The grain size analysis results were obtained in general accordance with ASTM D 6913. GeoEngineers 17425 NE Union Hill Road Ste 250, Redmond, WA 98052



PLASTICITY CHART



| Symbol | Boring Number | Depth (feet) | Moisture Content (%) | Liquid Limit (%) | Plasticity Index (%) | Soil Description |
|--------|---------------|--------------|----------------------|------------------|----------------------|------------------|
| ◆      | TP-1          | 3            | 49                   | 58               | 25                   | Silt (MH)        |

Atterberg Limits Test Results

The Rex Development  
Marysville, Washington



Figure A-8

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**APPENDIX B**  
**Cone Penetrometer Report**

# PRESENTATION OF SITE INVESTIGATION RESULTS

## Rex Development

*Prepared for:*

GeoEngineers, Inc.

ConeTec Job No: 21-59-22493

Project Start Date: 11-JUN-2021

Project End Date: 11-JUN-2021

Report Date: 18-JUN-2021



*Prepared by:*

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Introduction

The enclosed report presents the results of the site investigation program conducted by ConeTec Inc. for GeoEngineers, Inc. at 16408 51<sup>st</sup> Ave NE, Arlington, WA 98223. The program consisted of cone penetration tests.

Project Information

|                        |                    |
|------------------------|--------------------|
| Project                |                    |
| Client                 | GeoEngineers, Inc. |
| Project                | Rex Development    |
| ConeTec project number | 21-59-22493        |

An aerial overview from Google Earth including the CPTu test locations is presented below.



| Rig Description         | Deployment System         | Test Type |
|-------------------------|---------------------------|-----------|
| C05-023_20Ton Track Rig | Integrated Push Cylinders | CPTu      |

| Coordinates |                    |             |
|-------------|--------------------|-------------|
| Test Type   | Collection Method  | EPSG Number |
| CPTu        | Consumer grade GPS | 4326        |

| Cone Penetrometers Used for this Project |             |   |                                |                    |                       |                              |
|--|-------------|---|--------------------------------|--------------------|-----------------------|------------------------------|
| Cone Description                         | Cone Number | Cross Sectional Area (cm <sup>2</sup> ) | Sleeve Area (cm <sup>2</sup> ) | Tip Capacity (bar) | Sleeve Capacity (bar) | Pore Pressure Capacity (bar) |
| 730: T1500F15U35                         | 730         | 15.0                                    | 225                            | 1500               | 15                    | 35                           |
| Cone 730 was used for all CPTu soundings |             |   |                                |                    |                       |                              |

| Cone Penetration Test (CPTu) |  |
|------------------------------|--|
| Depth reference              | Depths are referenced to the existing ground surface at the time of each test.   |
| Tip and sleeve data offset   | 0.1 meter<br>This has been accounted for in the CPT data files.  |
| Additional plots             | <ul style="list-style-type: none"> <li>Advanced plots with <math>I_c</math>, <math>S_u</math>, <math>\phi</math> and <math>N(60)/N1(60)</math></li> <li>Soil Behaviour Type (SBT) scatter plots</li> </ul> |

| Calculated Geotechnical Parameter Tables |   |
|--|---|
| Additional information                   | <p>The Normalized Soil Behaviour Type Chart based on <math>Q_{tn}</math> (SBT <math>Q_{tn}</math>) (Robertson, 2009) was used to classify the soil for this project. A detailed set of calculated CPTu parameters have been generated and are provided in Excel format files in the release folder. The CPTu parameter calculations are based on values of corrected tip resistance (<math>q_t</math>) sleeve friction (<math>f_s</math>) and pore pressure (<math>u_2</math>).</p> <p>Effective stresses are calculated based on unit weights that have been assigned to the individual soil behaviour type zones and the assumed equilibrium pore pressure profile.</p> |

### Limitations

This report has been prepared for the exclusive use of GeoEngineers, Inc. (Client) for the project titled "Rex Development". The report's contents may not be relied upon by any other party without the express written permission of ConeTec Inc. (ConeTec). ConeTec has provided site investigation services, prepared the factual data reporting and provided geotechnical parameter calculations consistent with current best practices. No other warranty, expressed or implied, is made.

The information presented in the report document and the accompanying data set pertain to the specific project, site conditions and objectives described to ConeTec by the Client. In order to properly understand the factual data, assumptions and calculations, reference must be made to the documents provided and their accompanying data sets, in their entirety.

Cone penetration tests (CPTu) are conducted using an integrated electronic piezocone penetrometer and data acquisition system manufactured by Adara Systems Ltd., a subsidiary of ConeTec.

ConeTec's piezocone penetrometers are compression type designs in which the tip and friction sleeve load cells are independent and have separate load capacities. The piezocones use strain gauged load cells for tip and sleeve friction and a strain gauged diaphragm type transducer for recording pore pressure. The piezocones also have a platinum resistive temperature device (RTD) for monitoring the temperature of the sensors, an accelerometer type dual axis inclinometer and two geophone sensors for recording seismic signals. All signals are amplified and measured with minimum sixteen-bit resolution down hole within the cone body, and the signals are sent to the surface using a high bandwidth, error corrected digital interface through a shielded cable.

ConeTec penetrometers are manufactured with various tip, friction and pore pressure capacities in both 10 cm<sup>2</sup> and 15 cm<sup>2</sup> tip base area configurations in order to maximize signal resolution for various soil conditions. The specific piezocone used for each test is described in the CPT summary table presented in the first appendix. The 15 cm<sup>2</sup> penetrometers do not require friction reducers as they have a diameter larger than the deployment rods. The 10 cm<sup>2</sup> piezocones use a friction reducer consisting of a rod adapter extension behind the main cone body with an enlarged cross sectional area (typically 44 millimeters diameter over a length of 32 millimeters with tapered leading and trailing edges) located at a distance of 585 millimeters above the cone tip.

The penetrometers are designed with equal end area friction sleeves, a net end area ratio of 0.8 and cone tips with a 60 degree apex angle.

All ConeTec piezocones can record pore pressure at various locations. Unless otherwise noted, the pore pressure filter is located directly behind the cone tip in the "u<sub>2</sub>" position ([ASTM Type 2](#)). The filter is six millimeters thick, made of porous plastic (polyethylene) having an average pore size of 125 microns (90-160 microns). The function of the filter is to allow rapid movements of extremely small volumes of water needed to activate the pressure transducer while preventing soil ingress or blockage.

The piezocone penetrometers are manufactured with dimensions, tolerances and sensor characteristics that are in general accordance with the current [ASTM D5778](#) standard. ConeTec's calibration criteria also meets or exceeds those of the current [ASTM D5778](#) standard. An illustration of the piezocone penetrometer is presented in [Figure CPTu](#).

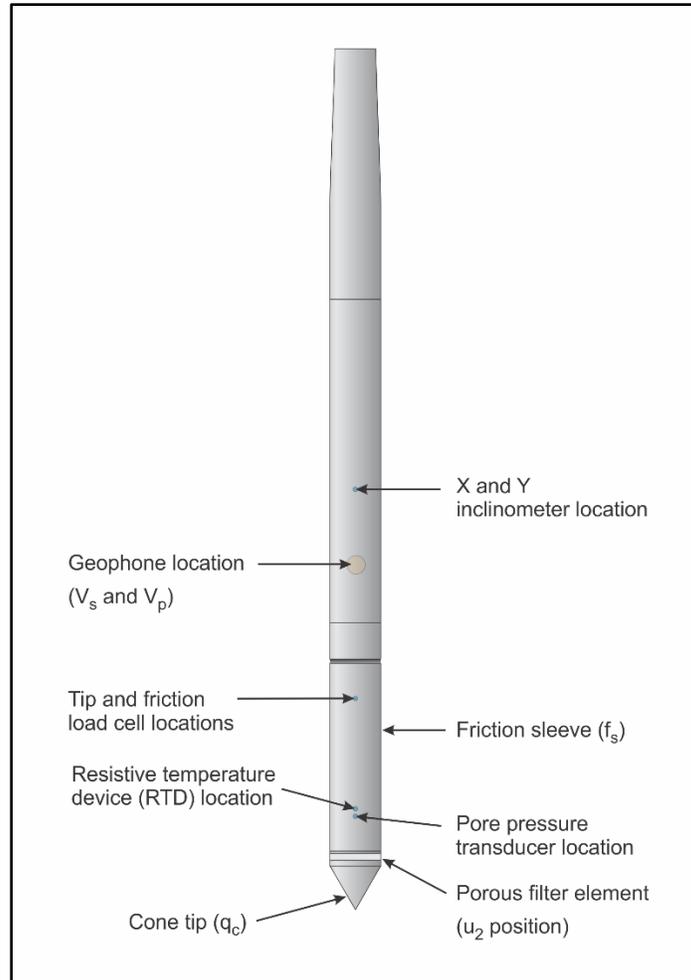


Figure CPTu. Piezocone Penetrometer (15 cm<sup>2</sup>)

The ConeTec data acquisition systems consist of a Windows based computer and a signal interface box and power supply. The signal interface combines depth increment signals, seismic trigger signals and the downhole digital data. This combined data is then sent to the Windows based computer for collection and presentation. The data is recorded at fixed depth increments using a depth wheel attached to the push cylinders or by using a spring loaded rubber depth wheel that is held against the cone rods. The typical recording interval is 2.5 centimeters; custom recording intervals are possible.

The system displays the CPTu data in real time and records the following parameters to a storage media during penetration:

- Depth
- Uncorrected tip resistance ( $q_c$ )
- Sleeve friction ( $f_s$ )
- Dynamic pore pressure ( $u$ )
- Additional sensors such as resistivity, passive gamma, ultra violet induced fluorescence, if applicable

All testing is performed in accordance to ConeTec's CPTu operating procedures which are in general accordance with the current [ASTM D5778](#) standard.

Prior to the start of a CPTu sounding a suitable cone is selected, the cone and data acquisition system are powered on, the pore pressure system is saturated with silicone oil and the baseline readings are recorded with the cone hanging freely in a vertical position.

The CPTu is conducted at a steady rate of two centimeters per second, within acceptable tolerances. Typically one meter length rods with an outer diameter of 1.5 inches (38.1 millimeters) are added to advance the cone to the sounding termination depth. After cone retraction final baselines are recorded.

Additional information pertaining to ConeTec's cone penetration testing procedures:

- Each filter is saturated in silicone oil under vacuum pressure prior to use
- Baseline readings are compared to previous readings
- Soundings are terminated at the client's target depth or at a depth where an obstruction is encountered, excessive rod flex occurs, excessive inclination occurs, equipment damage is likely to take place, or a dangerous working environment arises
- Differences between initial and final baselines are calculated to ensure zero load offsets have not occurred and to ensure compliance with [ASTM](#) standards

The interpretation of piezocone data for this report is based on the corrected tip resistance ( $q_t$ ), sleeve friction ( $f_s$ ) and pore water pressure ( $u$ ). The interpretation of soil type is based on the correlations developed by [Robertson et al. \(1986\)](#) and [Robertson \(1990, 2009\)](#). It should be noted that it is not always possible to accurately identify a soil behavior type based on these parameters. In these situations, experience, judgment and an assessment of other parameters may be used to infer soil behavior type.

The recorded tip resistance ( $q_c$ ) is the total force acting on the piezocone tip divided by its base area. The tip resistance is corrected for pore pressure effects and termed corrected tip resistance ( $q_t$ ) according to the following expression presented in [Robertson et al. \(1986\)](#):

$$q_t = q_c + (1-a) \cdot u_2$$

where:  $q_t$  is the corrected tip resistance

$q_c$  is the recorded tip resistance

$u_2$  is the recorded dynamic pore pressure behind the tip ( $u_2$  position)

$a$  is the Net Area Ratio for the piezocone (0.8 for ConeTec probes)

The sleeve friction ( $f_s$ ) is the frictional force on the sleeve divided by its surface area. As all ConeTec piezocones have equal end area friction sleeves, pore pressure corrections to the sleeve data are not required.

The dynamic pore pressure ( $u$ ) is a measure of the pore pressures generated during cone penetration. To record equilibrium pore pressure, the penetration must be stopped to allow the dynamic pore pressures to stabilize. The rate at which this occurs is predominantly a function of the permeability of the soil and the diameter of the cone.

The friction ratio ( $R_f$ ) is a calculated parameter. It is defined as the ratio of sleeve friction to the tip resistance expressed as a percentage. Generally, saturated cohesive soils have low tip resistance, high friction ratios and generate large excess pore water pressures. Cohesionless soils have higher tip resistances, lower friction ratios and do not generate significant excess pore water pressure.

A summary of the CPTu soundings along with test details and individual plots are provided in the appendices. A set of files with calculated geotechnical parameters were generated for each sounding based on published correlations and are provided in Excel format in the data release folder. Information regarding the methods used is also included in the data release folder.

For additional information on CPTu interpretations and calculated geotechnical parameters, refer to [Robertson et al. \(1986\)](#), [Lunne et al. \(1997\)](#), [Robertson \(2009\)](#), [Mayne \(2013, 2014\)](#) and [Mayne and Peuchen \(2012\)](#).

The cone penetration test is halted at specific depths to carry out pore pressure dissipation (PPD) tests, shown in Figure PPD-1. For each dissipation test the cone and rods are decoupled from the rig and the data acquisition system measures and records the variation of the pore pressure ( $u$ ) with time ( $t$ ).

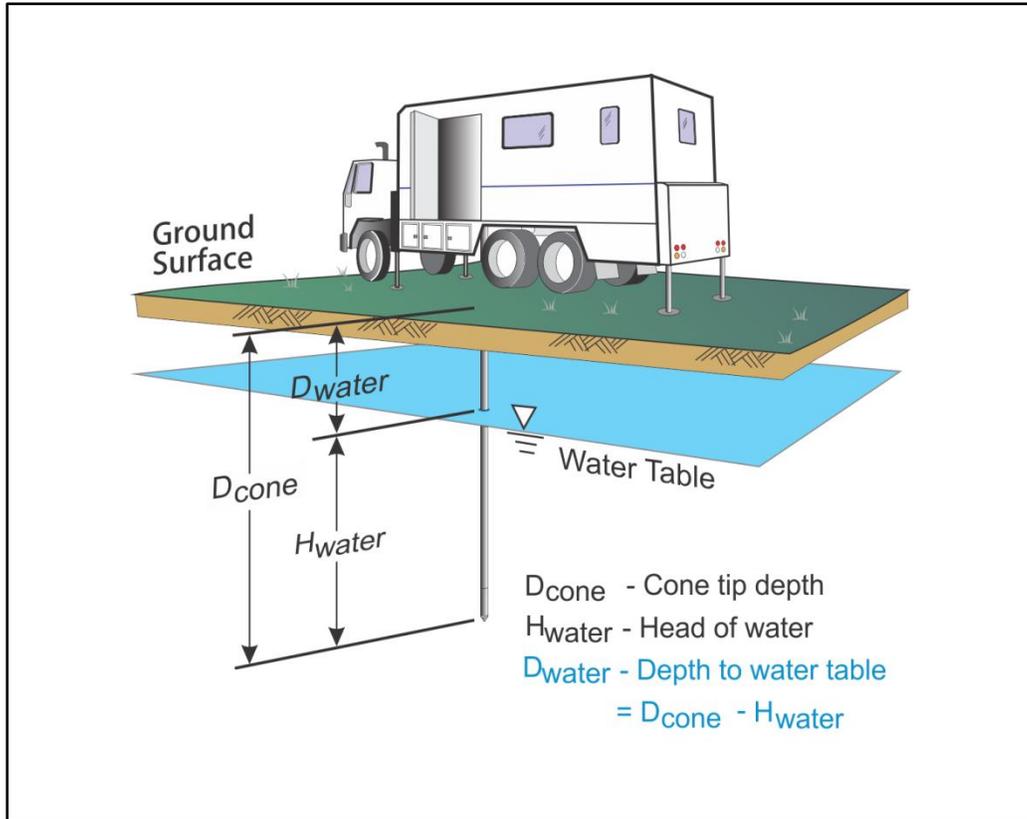


Figure PPD-1. Pore pressure dissipation test setup

Pore pressure dissipation data can be interpreted to provide estimates of ground water conditions, permeability, consolidation characteristics and soil behavior.

The typical shapes of dissipation curves shown in Figure PPD-2 are very useful in assessing soil type, drainage, in situ pore pressure and soil properties. A flat curve that stabilizes quickly is typical of a freely draining sand. Undrained soils such as clays will typically show positive excess pore pressure and have long dissipation times. Dilative soils will often exhibit dynamic pore pressures below equilibrium that then rise over time. Overconsolidated fine-grained soils will often exhibit an initial dilatory response where there is an initial rise in pore pressure before reaching a peak and dissipating.

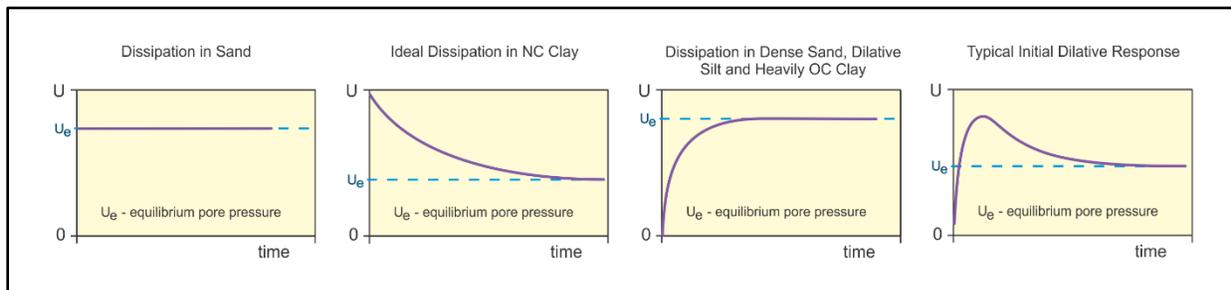


Figure PPD-2. Pore pressure dissipation curve examples

In order to interpret the equilibrium pore pressure ( $u_{eq}$ ) and the apparent phreatic surface, the pore pressure should be monitored until such time as there is no variation in pore pressure with time as shown for each curve in [Figure PPD-2](#).

In fine grained deposits the point at which 100% of the excess pore pressure has dissipated is known as  $t_{100}$ . In some cases this can take an excessive amount of time and it may be impractical to take the dissipation to  $t_{100}$ . A theoretical analysis of pore pressure dissipations by [Teh and Houlsby \(1991\)](#) showed that a single curve relating degree of dissipation versus theoretical time factor ( $T^*$ ) may be used to calculate the coefficient of consolidation ( $c_h$ ) at various degrees of dissipation resulting in the expression for  $c_h$  shown below.

$$c_h = \frac{T^* \cdot a^2 \cdot \sqrt{l_r}}{t}$$

Where:

- $T^*$  is the dimensionless time factor ([Table Time Factor](#))
- $a$  is the radius of the cone
- $l_r$  is the rigidity index
- $t$  is the time at the degree of consolidation

Table Time Factor.  $T^*$  versus degree of dissipation ([Teh and Houlsby \(1991\)](#))

| Degree of Dissipation (%) | 20    | 30    | 40    | 50    | 60    | 70    | 80   |
|---------------------------|-------|-------|-------|-------|-------|-------|------|
| $T^* (u_2)$               | 0.038 | 0.078 | 0.142 | 0.245 | 0.439 | 0.804 | 1.60 |

The coefficient of consolidation is typically analyzed using the time ( $t_{50}$ ) corresponding to a degree of dissipation of 50% ( $u_{50}$ ). In order to determine  $t_{50}$ , dissipation tests must be taken to a pressure less than  $u_{50}$ . The  $u_{50}$  value is half way between the initial maximum pore pressure and the equilibrium pore pressure value, known as  $u_{100}$ . To estimate  $u_{50}$ , both the initial maximum pore pressure and  $u_{100}$  must be known or estimated. Other degrees of dissipations may be considered, particularly for extremely long dissipations.

At any specific degree of dissipation the equilibrium pore pressure ( $u$  at  $t_{100}$ ) must be estimated at the depth of interest. The equilibrium value may be determined from one or more sources such as measuring the value directly ( $u_{100}$ ), estimating it from other dissipations in the same profile, estimating the phreatic surface and assuming hydrostatic conditions, from nearby soundings, from client provided information, from site observations and/or past experience, or from other site instrumentation.

For calculations of  $c_h$  ([Teh and Houlsby \(1991\)](#)),  $t_{50}$  values are estimated from the corresponding pore pressure dissipation curve and a rigidity index ( $l_r$ ) is assumed. For curves having an initial dilatory response in which an initial rise in pore pressure occurs before reaching a peak, the relative time from the peak value is used in determining  $t_{50}$ . In cases where the time to peak is excessive,  $t_{50}$  values are not calculated.

Due to possible inherent uncertainties in estimating  $l_r$ , the equilibrium pore pressure and the effect of an initial dilatory response on calculating  $t_{50}$ , other methods should be applied to confirm the results for  $c_h$ .

Additional published methods for estimating the coefficient of consolidation from a piezocone test are described in Burns and Mayne (1998, 2002), Jones and Van Zyl (1981), Robertson et al. (1992) and Sully et al. (1999).

A summary of the pore pressure dissipation tests and dissipation plots are presented in the relevant appendix.

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---

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The appendices listed below are included in the report:

- Cone Penetration Test Summary and Standard Cone Penetration Test Plots
- Advanced Cone Penetration Test Plots with  $I_c$ ,  $S_u(N_{kt})$ ,  $\Phi$  and  $N(60)I_c/N1(60)I_c$
- Soil Behavior Type (SBT) Scatter Plots
- Pore Pressure Dissipation Summary and Pore Pressure Dissipation Plots

# Cone Penetration Test Summary and Standard Cone Penetration Test Plots

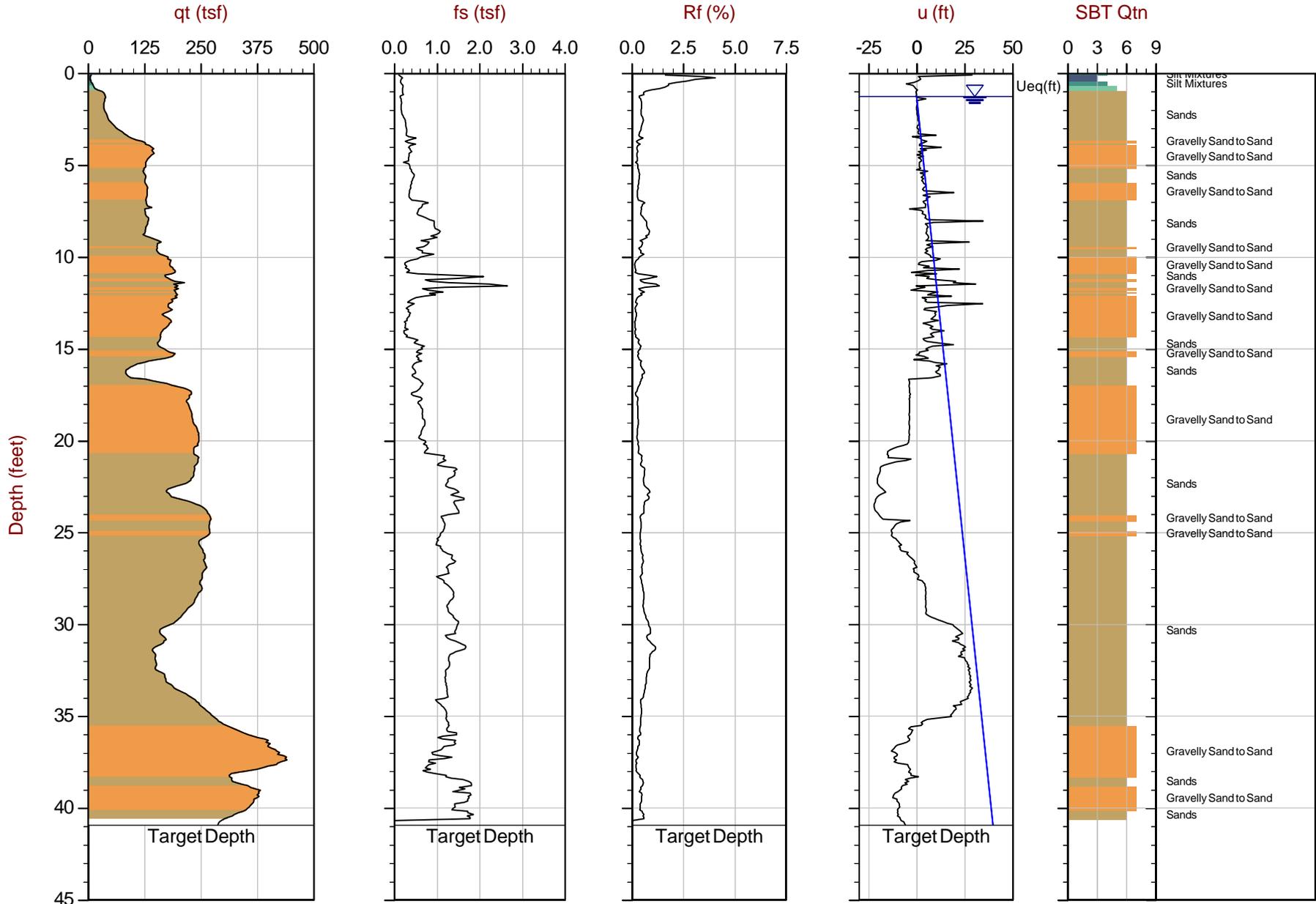


Job No: 21-59-22493  
Client: GeoEngineers, Inc.  
Project: Rex Development  
Start Date: 11-Jun-2021  
End Date: 11-Jun-2021

### CONE PENETRATION TEST SUMMARY

| Sounding ID | File Name        | Date        | Cone             | Assumed <sup>1</sup><br>Phreatic<br>Surface<br>(ft) | Final<br>Depth<br>(ft) | Latitude <sup>3</sup><br>(deg) | Longitude <sup>3</sup><br>(deg) | Refer to<br>Notation<br>Number |
|-------------|------------------|-------------|------------------|---|------------------------|--------------------------------|---------------------------------|--------------------------------|
| CPT-01      | 21-59-22493_CP01 | 11-Jun-2021 | 730: T1500F15U35 | 1.2   | 40.9                   | 48.13860                       | -122.16576                      | 2                              |
| CPT-02      | 21-59-22493_CP02 | 11-Jun-2021 | 730: T1500F15U35 | 1.2   | 40.6                   | 48.13976                       | -122.16327                      |                                |
| CPT-03      | 21-59-22493_CP03 | 11-Jun-2021 | 730: T1500F15U35 | 1.6   | 40.4                   | 48.14251                       | -122.16966                      |                                |
| CPT-04      | 21-59-22493_CP04 | 11-Jun-2021 | 730: T1500F15U35 | 1.9   | 40.9                   | 48.14339                       | -122.16422                      |                                |
| CPT-05      | 21-59-22493_CP05 | 11-Jun-2021 | 730: T1500F15U35 | 1.9   | 40.8                   | 48.14768                       | -122.16821                      | 2                              |
| Totals      | 5 soundings      |             |                  |   | 203.7                  |                                |                                 |                                |

1. Phreatic surface based on pore pressure dissipation test unless otherwise noted. Hydrostatic profile applied to interpretation tables
2. Phreatic surface based on adjacent sounding pore pressure dissipation test. Hydrostatic profile applied to interpretation tables
3. Coordinates were collected using a handheld GPS - WGS 84 Lat/Long



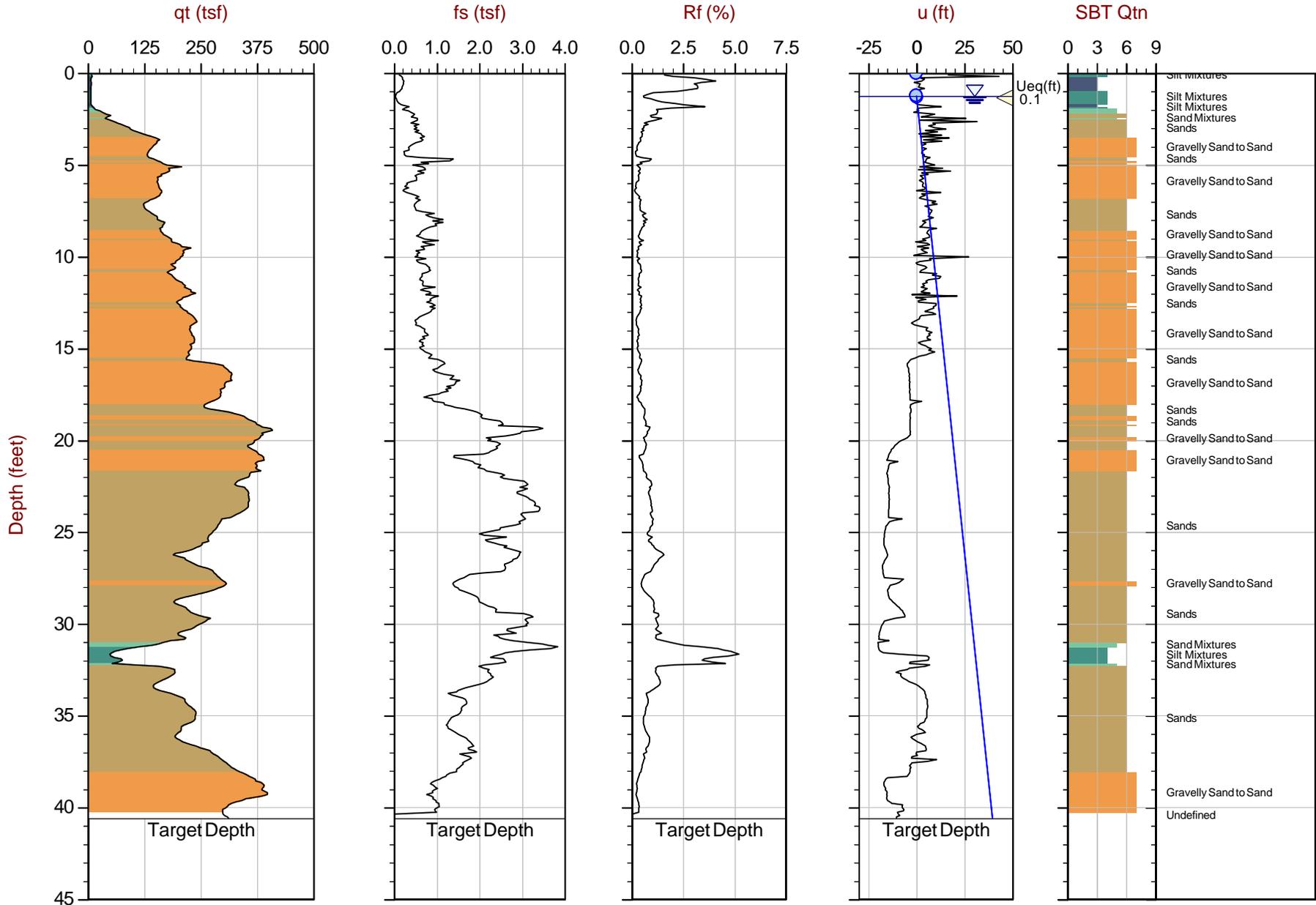
Max Depth: 12.475 m / 40.93 ft  
 Depth Inc: 0.025 m / 0.082 ft  
 Avg Int: Every Point

File: 21-59-22493\_CP01.COR  
 Unit Wt: SBTQtn(PKR2009)

SBT: Robertson, 2009 and 2010  
 Coords: Lat: 48.13860 Long: -122.16576

● Equilibrium Pore Pressure (Ueq)    
 ○ Assumed Ueq    
 ◀ Dissipation, Ueq achieved    
 ◀ Dissipation, Ueq not achieved    
 — Hydrostatic Line

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



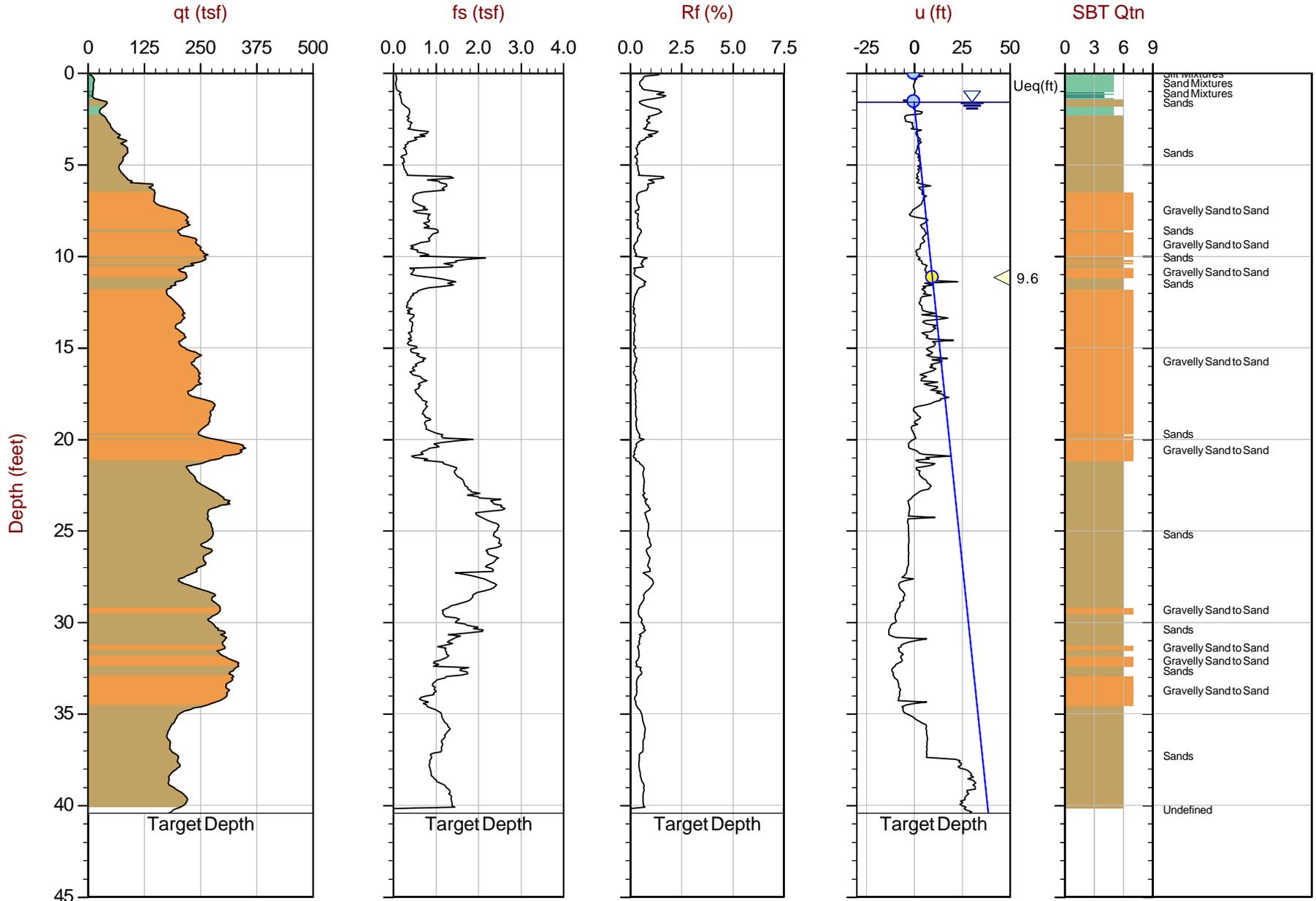
Max Depth: 12.375 m / 40.60 ft  
 Depth Inc: 0.025 m / 0.082 ft  
 Avg Int: Every Point

File: 21-59-22493\_CP02.COR  
 Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010  
 Coords: Lat: 48.13976 Long: -122.16327

● Equilibrium Pore Pressure (Ueq)    
 ○ Assumed Ueq    
 ◁ Dissipation, Ueq achieved    
 ◁ Dissipation, Ueq not achieved    
 — Hydrostatic Line

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



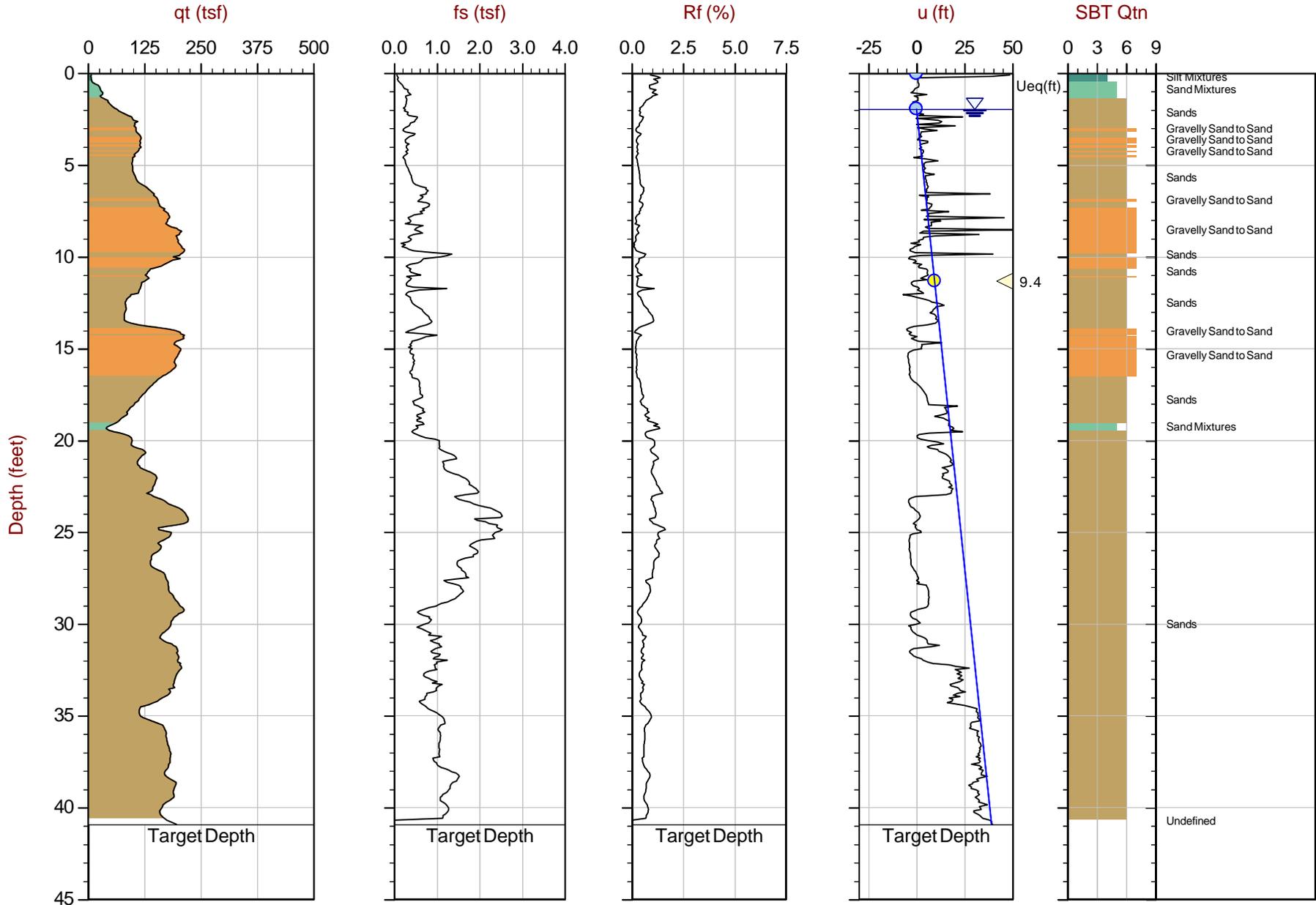
Max Depth: 12.325 m / 40.44 ft  
 Depth Inc: 0.025 m / 0.082 ft  
 Avg Int: Every Point

File: 21-59-22493\_CP03.COR  
 Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010  
 Coords: Lat: 48.14251 Long: -122.16966

● Equilibrium Pore Pressure (Ueq)    
 ● Assumed Ueq    
 ◁ Dissipation, Ueq achieved    
 ◁ Dissipation, Ueq not achieved    
 — Hydrostatic Line

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



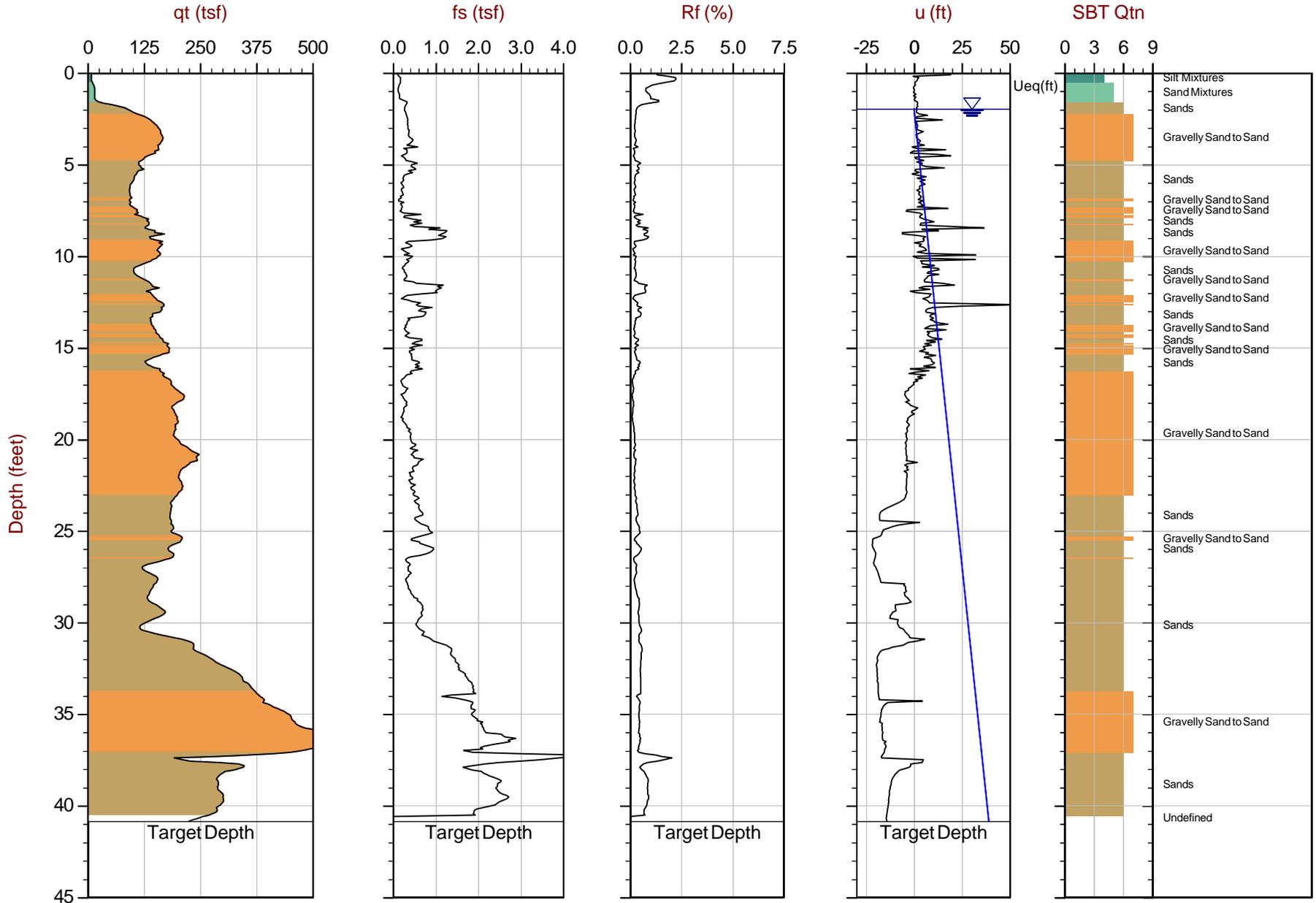
Max Depth: 12.475 m / 40.93 ft  
 Depth Inc: 0.025 m / 0.082 ft  
 Avg Int: Every Point

File: 21-59-22493\_CP04.COR  
 Unit Wt: SBTQtn(PKR2009)

SBT: Robertson, 2009 and 2010  
 Coords: Lat: 48.14339 Long: -122.16422

● Equilibrium Pore Pressure (Ueq)    
 ● Assumed Ueq    
 ◁ Dissipation, Ueq achieved    
 ◁ Dissipation, Ueq not achieved    
 — Hydrostatic Line

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Max Depth: 12.450 m / 40.85 ft  
 Depth Inc: 0.025 m / 0.082 ft  
 Avg Int: Every Point

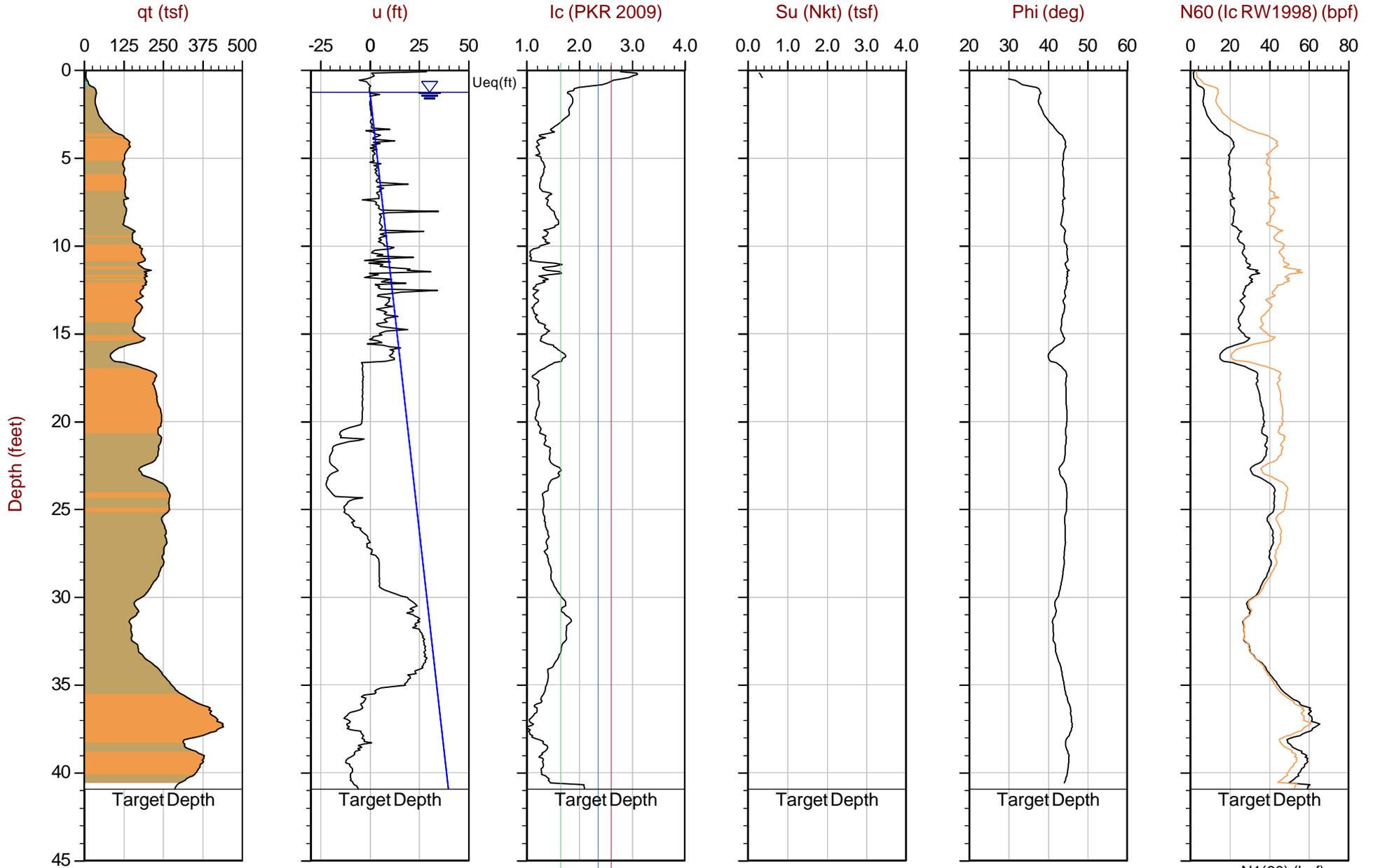
File: 21-59-22493\_CP05.COR  
 Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010  
 Coords: Lat: 48.14768 Long: -122.16821

● Equilibrium Pore Pressure (Ueq)    
 ● Assumed Ueq    
 ◀ Dissipation, Ueq achieved    
 ◀ Dissipation, Ueq not achieved    
 — Hydrostatic Line

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Advanced Cone Penetration Test Plots with  $I_c$ ,  $S_u$ ,  $\Phi$  and  $N(60)/N1(60)$



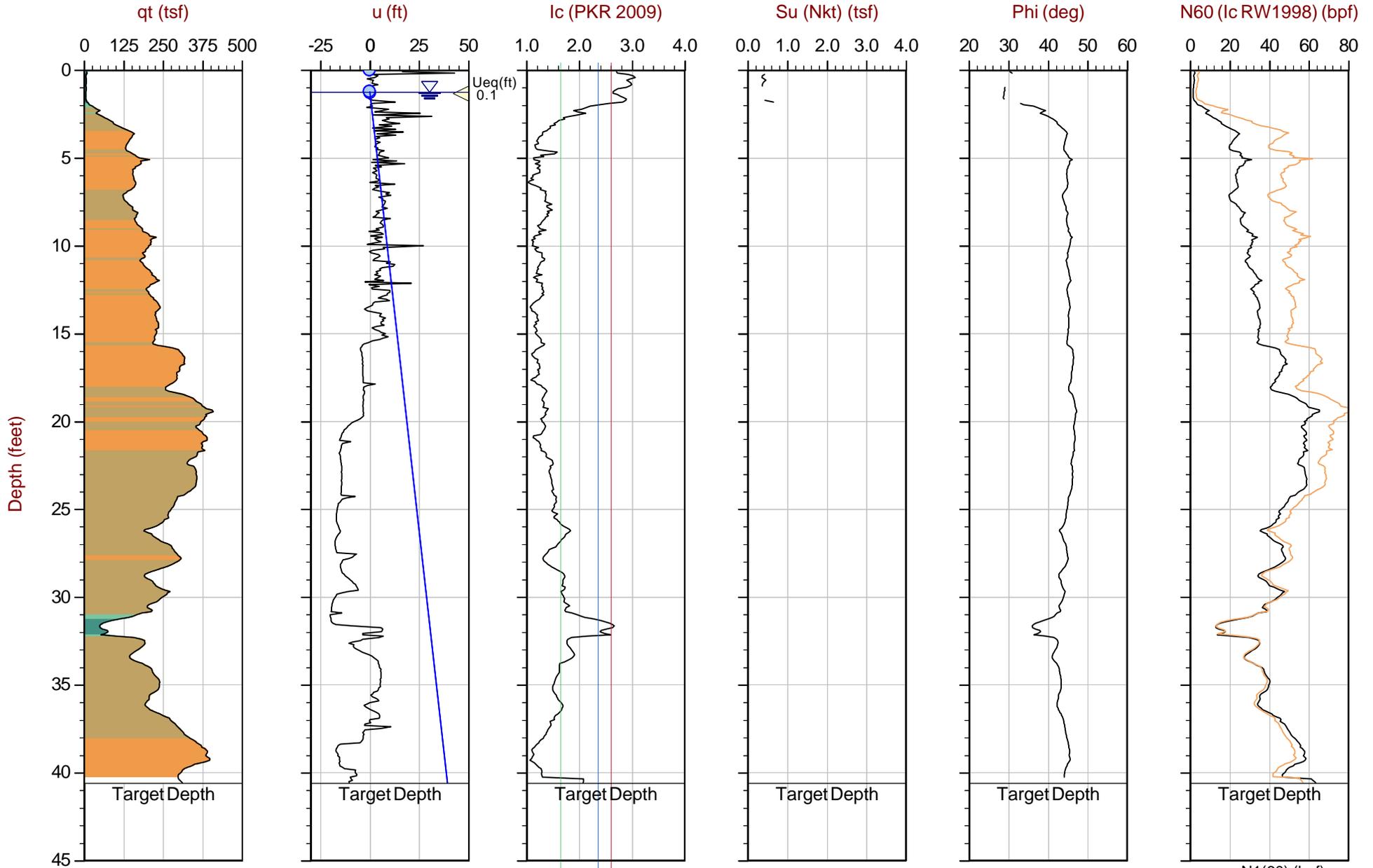
Max Depth: 12.475 m / 40.93 ft  
 Depth Inc: 0.025 m / 0.082 ft  
 Avg Int: Every Point

File: 21-59-22493\_CP01.COR  
 Unit Wt: SBTQtn(PKR2009)  
 Su Nkt: 15.0

SBT: Robertson, 2009 and 2010  
 Coords: Lat: 48.13860 Long: -122.16576

● Equilibrium Pore Pressure (Ueq)    
 ● Assumed Ueq    
 ◀ Dissipation, Ueq achieved    
 ◀ Dissipation, Ueq not achieved    
 — Hydrostatic Line

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



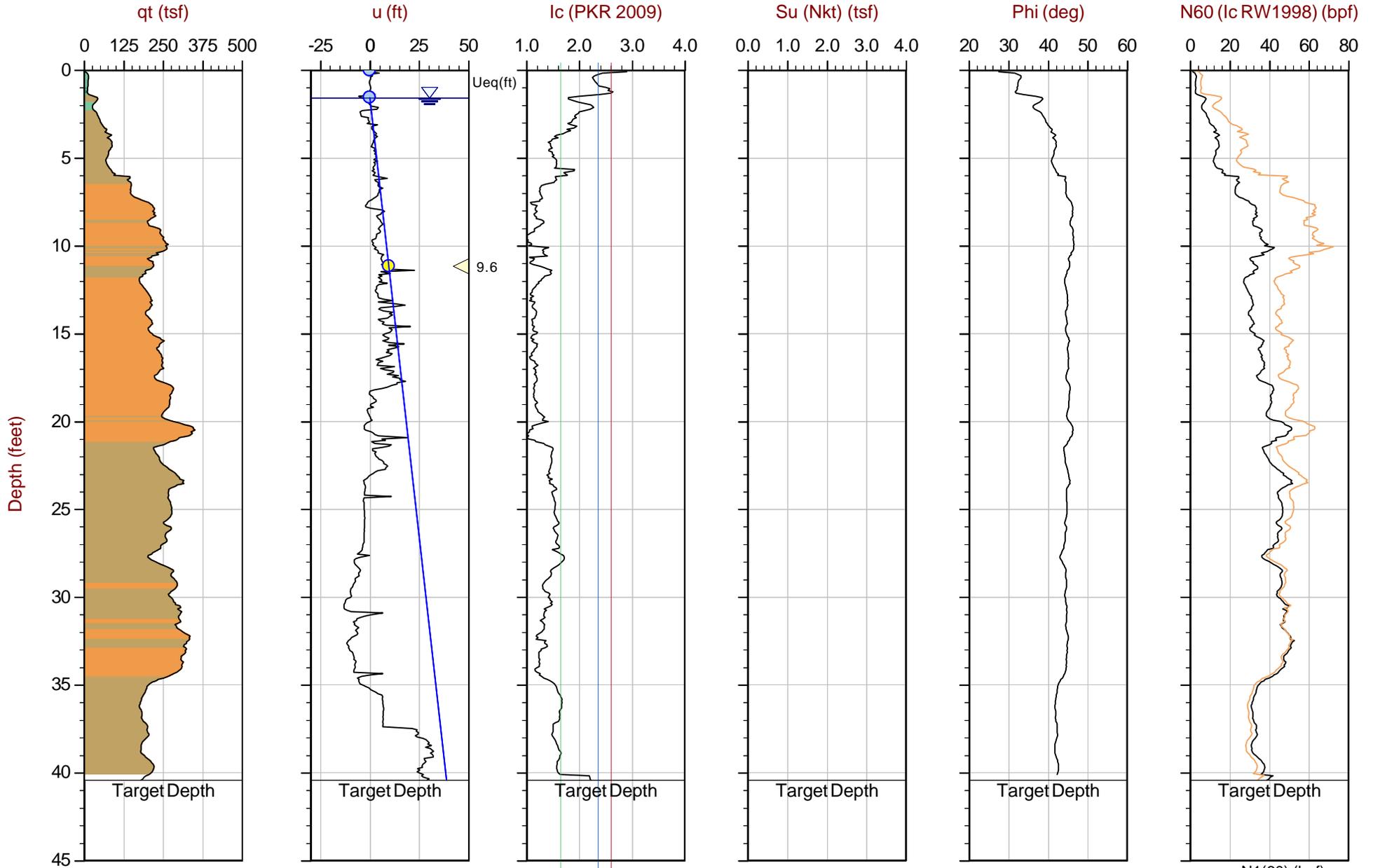
Max Depth: 12.375 m / 40.60 ft  
 Depth Inc: 0.025 m / 0.082 ft  
 Avg Int: Every Point

File: 21-59-22493\_CP02.COR  
 Unit Wt: SBTQtn(PKR2009)  
 Su Nkt: 15.0

SBT: Robertson, 2009 and 2010  
 Coords: Lat: 48.13976 Long: -122.16327

● Equilibrium Pore Pressure (Ueq)    
 ● Assumed Ueq    
 ◀ Dissipation, Ueq achieved    
 ◀ Dissipation, Ueq not achieved    
 — Hydrostatic Line

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



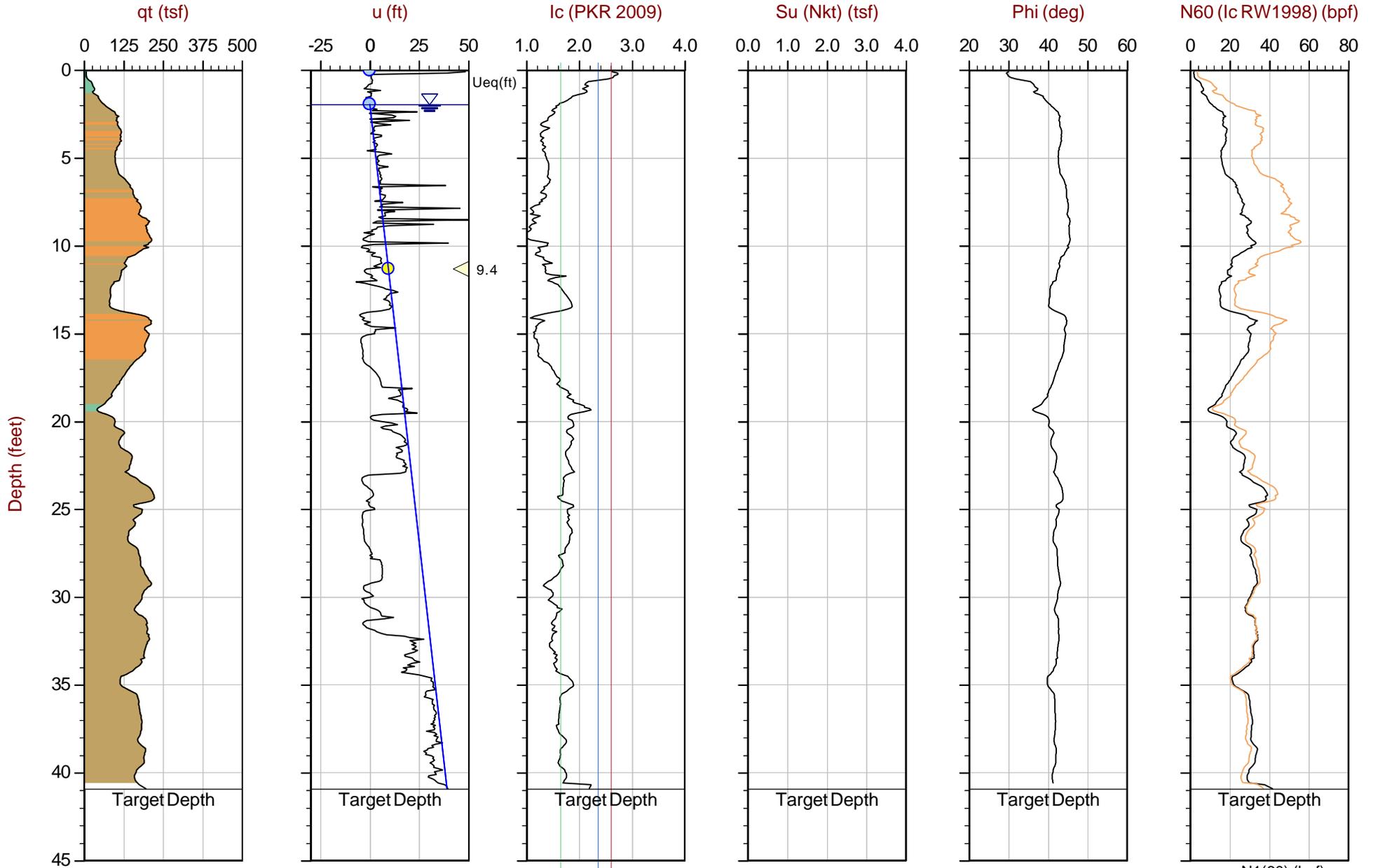
Max Depth: 12.325 m / 40.44 ft  
 Depth Inc: 0.025 m / 0.082 ft  
 Avg Int: Every Point

File: 21-59-22493\_CP03.COR  
 Unit Wt: SBTQtn (PKR2009)  
 Su Nkt: 15.0

SBT: Robertson, 2009 and 2010  
 Coords: Lat: 48.14251 Long: -122.16966

● Equilibrium Pore Pressure (Ueq)    
 ● Assumed Ueq    
 ◁ Dissipation, Ueq achieved    
 ◁ Dissipation, Ueq not achieved    
 — Hydrostatic Line

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



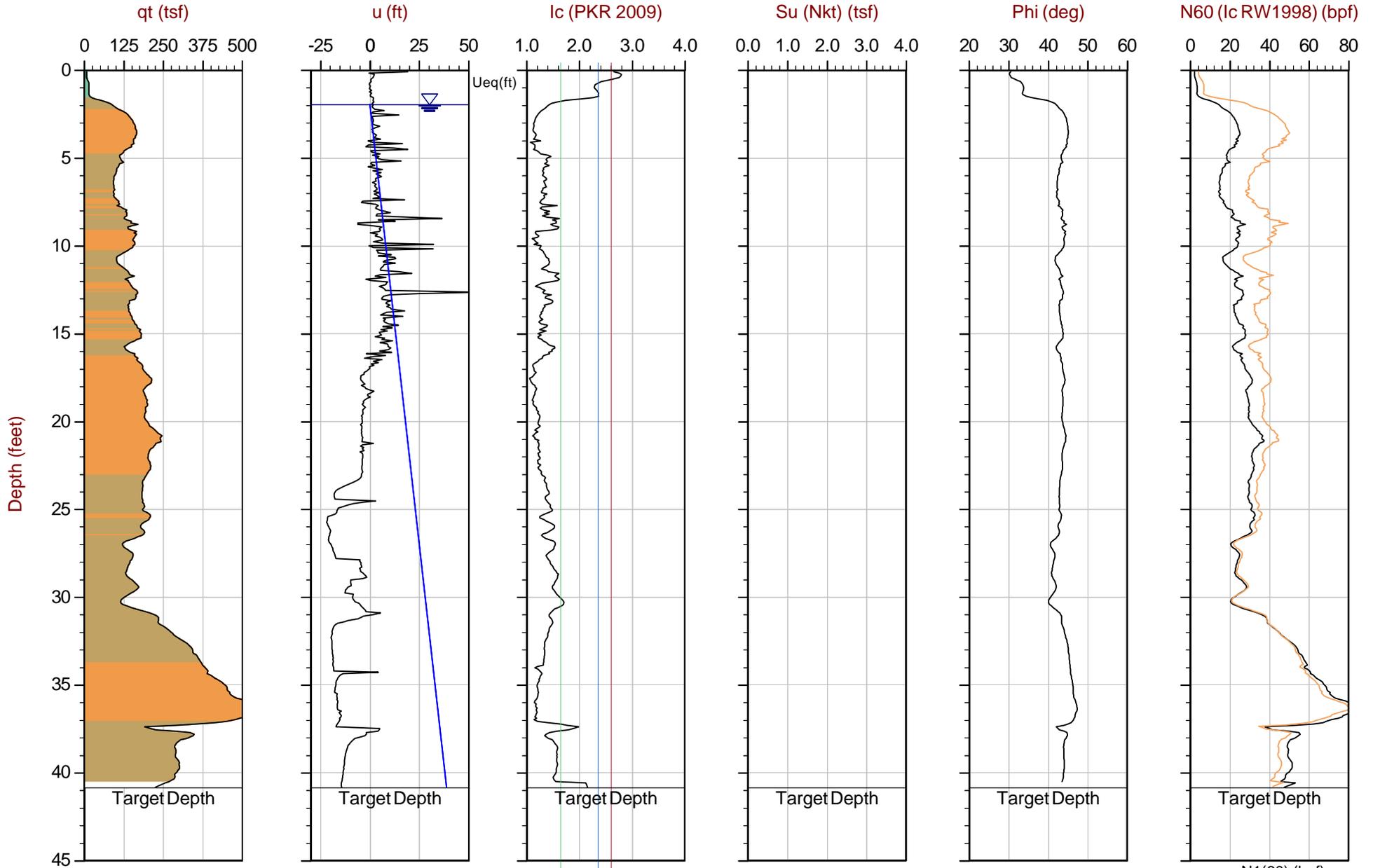
Max Depth: 12.475 m / 40.93 ft  
 Depth Inc: 0.025 m / 0.082 ft  
 Avg Int: Every Point

File: 21-59-22493\_CP04.COR  
 Unit Wt: SBTQtn(PKR2009)  
 Su Nkt: 15.0

SBT: Robertson, 2009 and 2010  
 Coords: Lat: 48.14339 Long: -122.16422

● Equilibrium Pore Pressure (Ueq)    
 ● Assumed Ueq    
 ◁ Dissipation, Ueq achieved    
 ◁ Dissipation, Ueq not achieved    
 — Hydrostatic Line

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Max Depth: 12.450 m / 40.85 ft  
 Depth Inc: 0.025 m / 0.082 ft  
 Avg Int: Every Point

File: 21-59-22493\_CP05.COR  
 Unit Wt: SBTQtn (PKR2009)  
 Su Nkt: 15.0

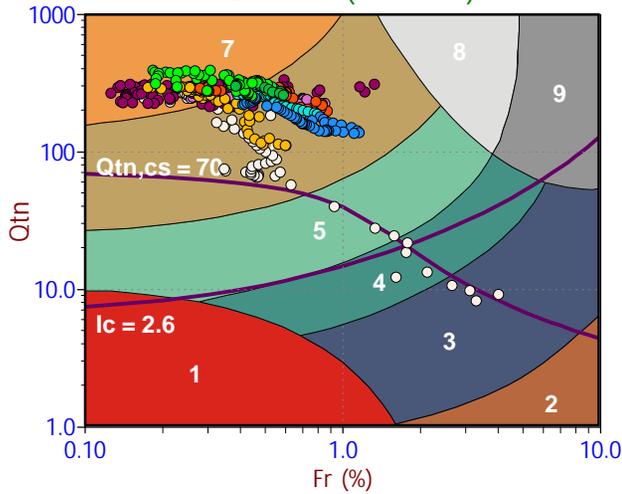
SBT: Robertson, 2009 and 2010  
 Coords: Lat: 48.14768 Long: -122.16821

● Equilibrium Pore Pressure (Ueq)    
 ● Assumed Ueq    
 ◀ Dissipation, Ueq achieved    
 ◀ Dissipation, Ueq not achieved    
 — Hydrostatic Line

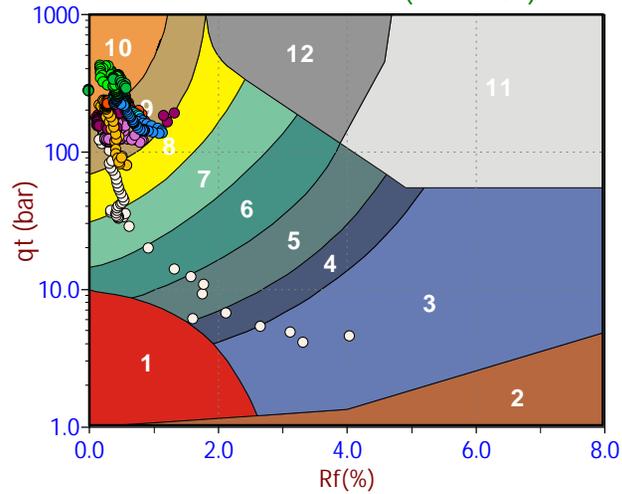
The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

## Soil Behavior Type (SBT) Scatter Plots

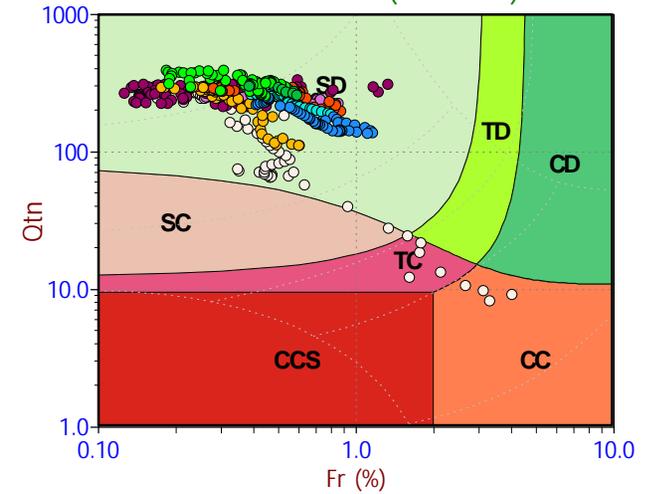
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges

- >0.0 to 5.0 ft
- >5.0 to 10.0 ft
- >10.0 to 15.0 ft
- >15.0 to 20.0 ft
- >20.0 to 25.0 ft
- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

Legend

- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

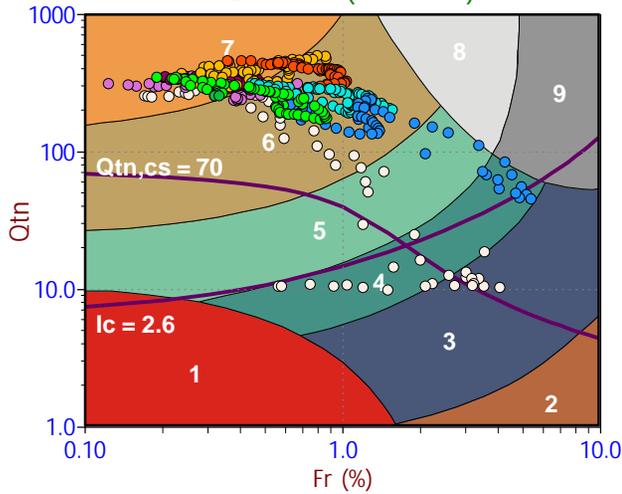
Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

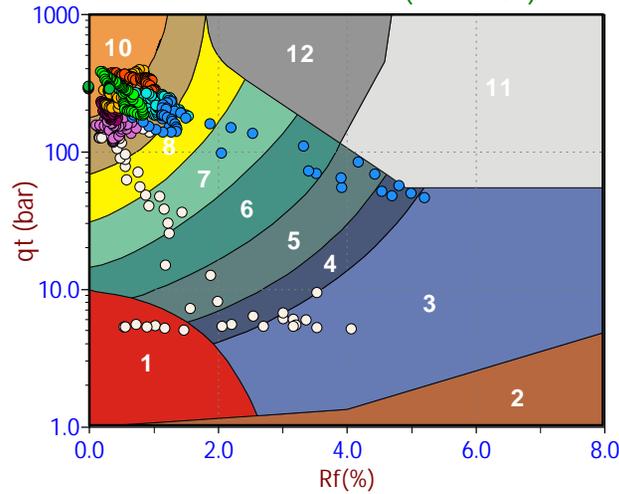
Legend

- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

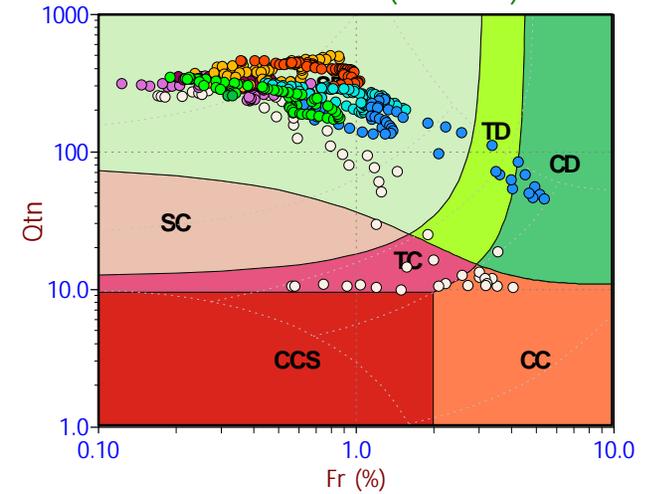
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges

- >0.0 to 5.0 ft
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- >15.0 to 20.0 ft
- >20.0 to 25.0 ft
- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

Legend

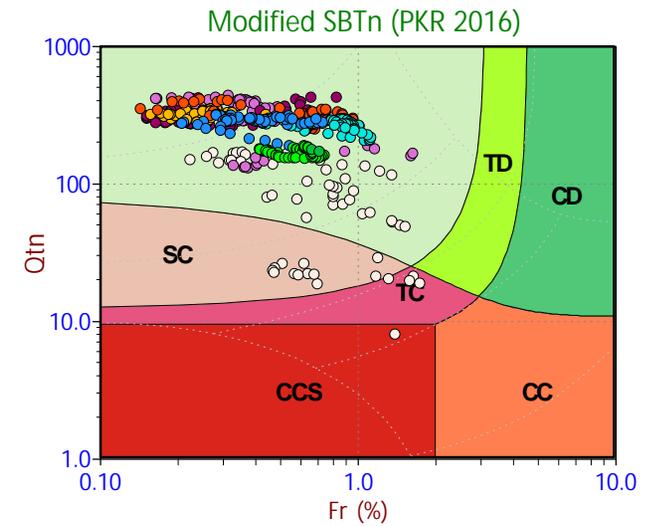
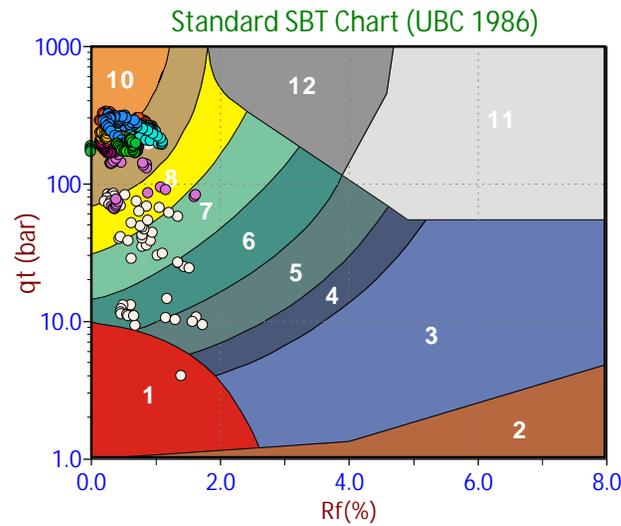
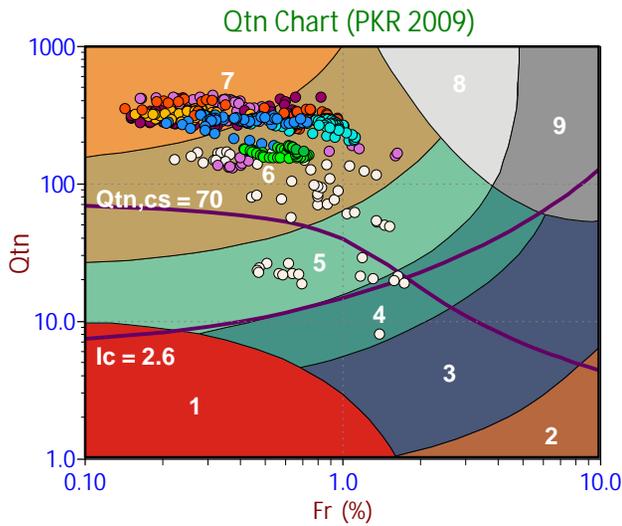
- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend

- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)



**Depth Ranges**

- >0.0 to 5.0 ft
- >5.0 to 10.0 ft
- >10.0 to 15.0 ft
- >15.0 to 20.0 ft
- >20.0 to 25.0 ft
- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

**Legend**

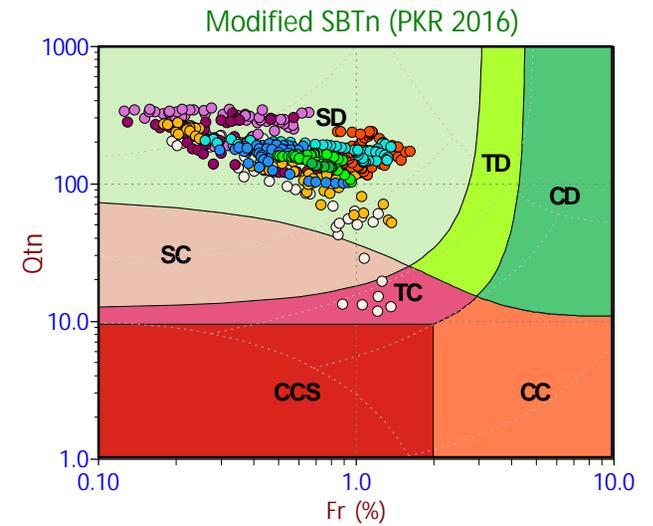
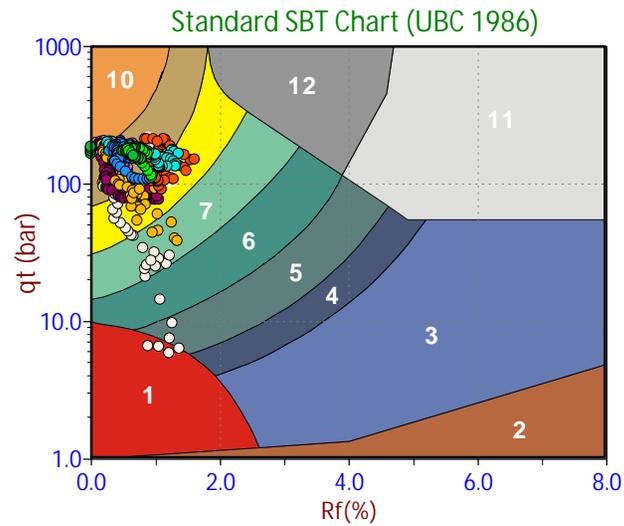
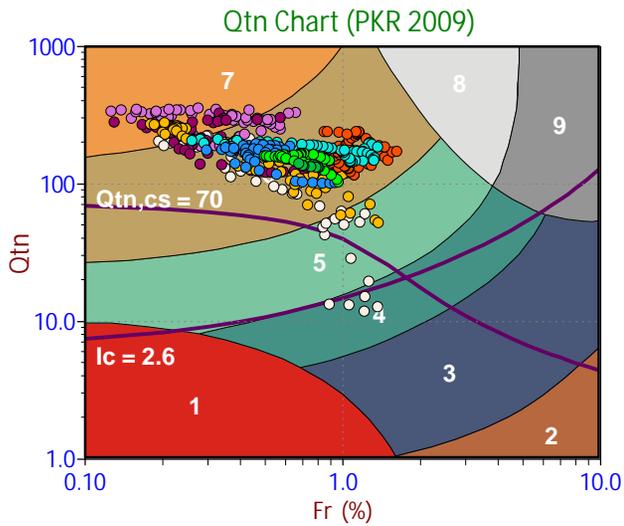
- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

**Legend**

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#### Depth Ranges

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- >15.0 to 20.0 ft
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- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

#### Legend

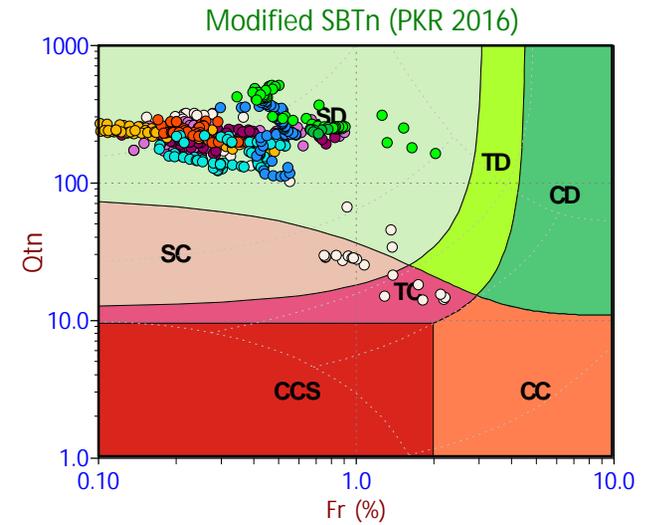
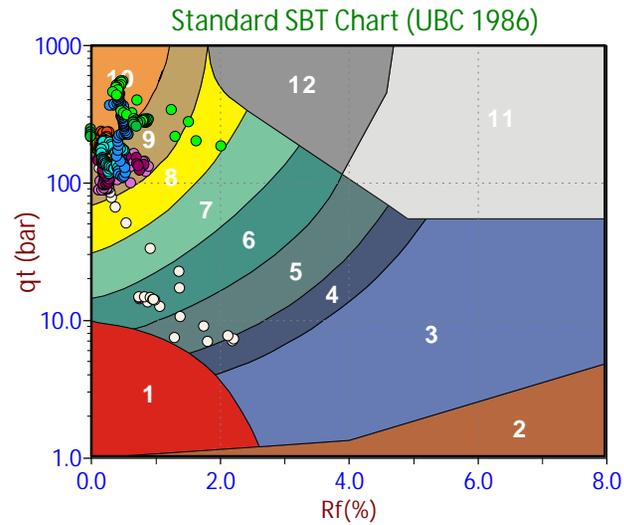
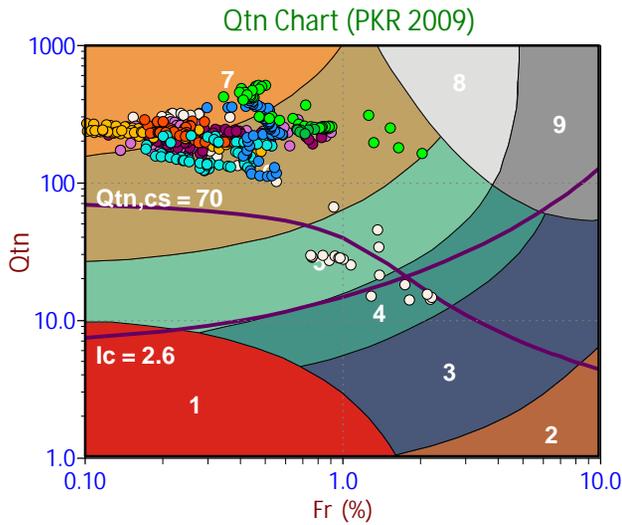
- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

#### Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

#### Legend

- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)



**Depth Ranges**

- >0.0 to 5.0 ft
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- >25.0 to 30.0 ft
- >30.0 to 35.0 ft
- >35.0 to 40.0 ft
- >40.0 to 45.0 ft
- >45.0 to 50.0 ft
- >50.0 ft

**Legend**

- Sensitive, Fine Grained
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- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

**Legend**

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- Organic Soil
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**Legend**

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- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

## Pore Pressure Dissipation Summary and Pore Pressure Dissipation Plots



Job No: 21-59-22493  
Client: GeoEngineers, Inc.  
Project: Rex Development  
Start Date: 11-Jun-2021  
End Date: 11-Jun-2021

**CPT<sub>u</sub> PORE PRESSURE DISSIPATION SUMMARY**

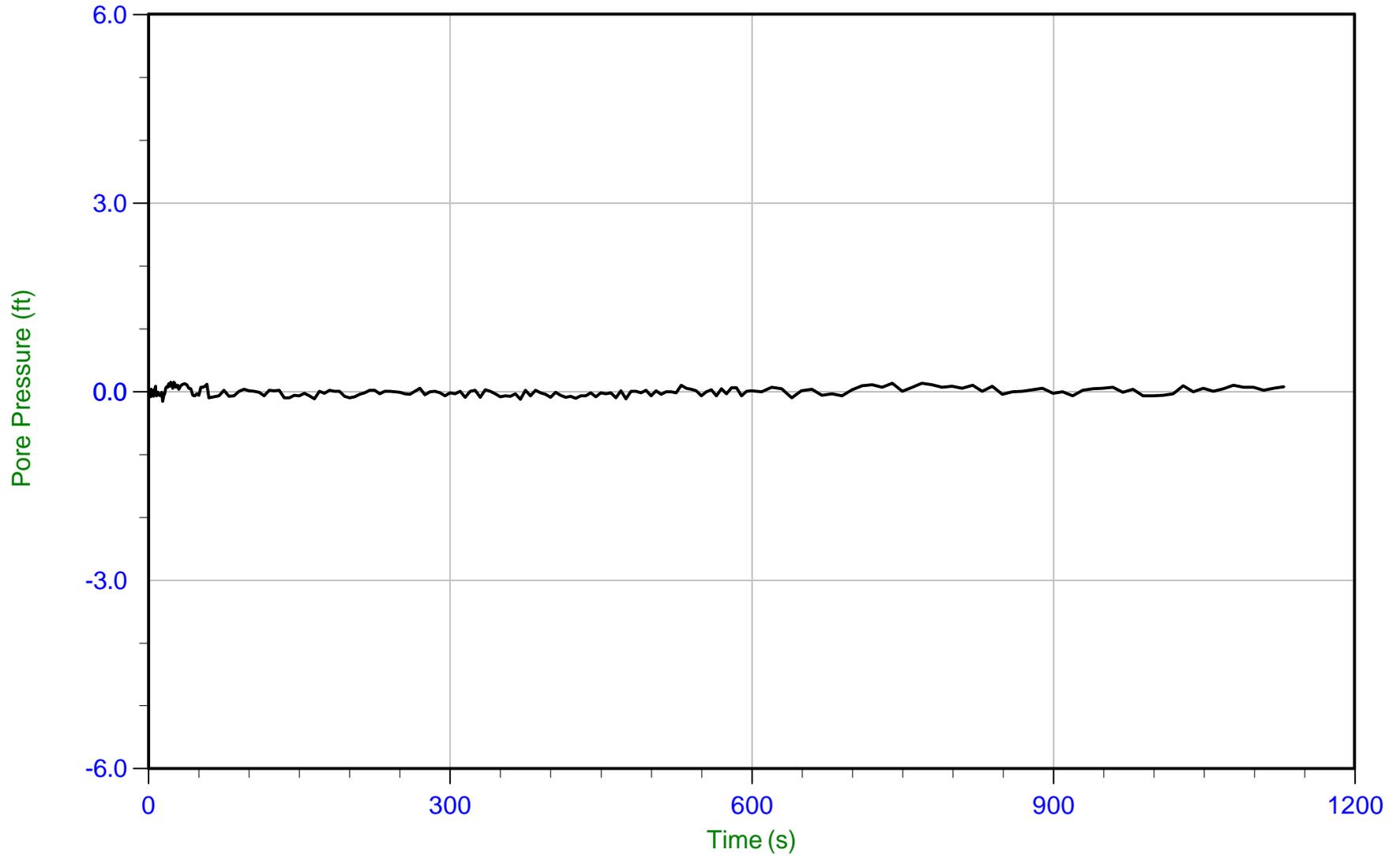
| Sounding ID    | File Name        | Cone Area (cm <sup>2</sup> ) | Duration (s) | Test Depth (ft) | Estimated Equilibrium Pore Pressure U <sub>eq</sub> (ft) | Calculated Phreatic Surface (ft) |
|----------------|------------------|------------------------------|--------------|-----------------|--|----------------------------------|
| CPT-02         | 21-59-22493_CP02 | 15.0                         | 1129.9       | 1.3             | 0.1  | 1.2                              |
| CPT-03         | 21-59-22493_CP03 | 15.0                         | 390.0        | 11.2            | 9.6  | 1.6                              |
| CPT-04         | 21-59-22493_CP04 | 15.0                         | 250.0        | 11.3            | 9.4  | 2.0                              |
| Total Duration |                  |                              | 29.5 min     |                 |  |                                  |



# GeoEngineers

Job No: 21-59-22493  
Date: 06/11/2021 12:30  
Site: Rex Development

Sounding: CPT-02  
Cone: 730:T1500F15U35 Area=15 cm<sup>2</sup>



### Trace Summary:

Filename: 21-59-22493\_CP02.ppd2  
Depth: 0.400 m / 1.312 ft  
Duration: 1129.9 s

u Min: -0.2 ft  
u Max: 0.1 ft  
u Final: 0.1 ft

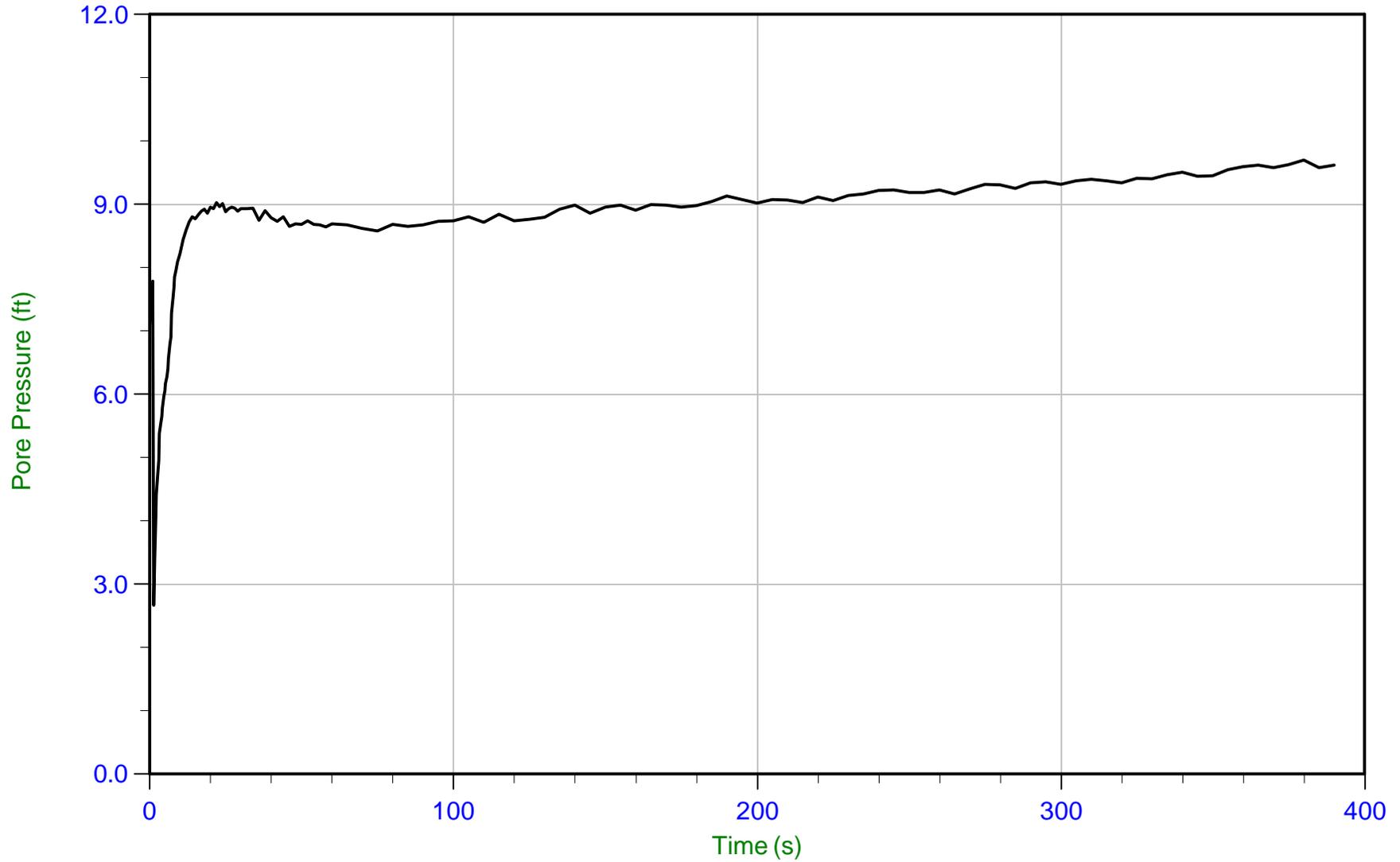
WT: 0.378 m / 1.241 ft  
Ueq: 0.1 ft



# GeoEngineers

Job No: 21-59-22493  
Date: 06/11/2021 09:07  
Site: Rex Development

Sounding: CPT-03  
Cone: 730:T1500F15U35 Area=15 cm<sup>2</sup>



### Trace Summary:

Filename: 21-59-22493\_CP03.ppd2  
Depth: 3.400 m / 11.155 ft  
Duration: 390.0 s

u Min: 2.7 ft  
u Max: 9.7 ft  
u Final: 9.6 ft

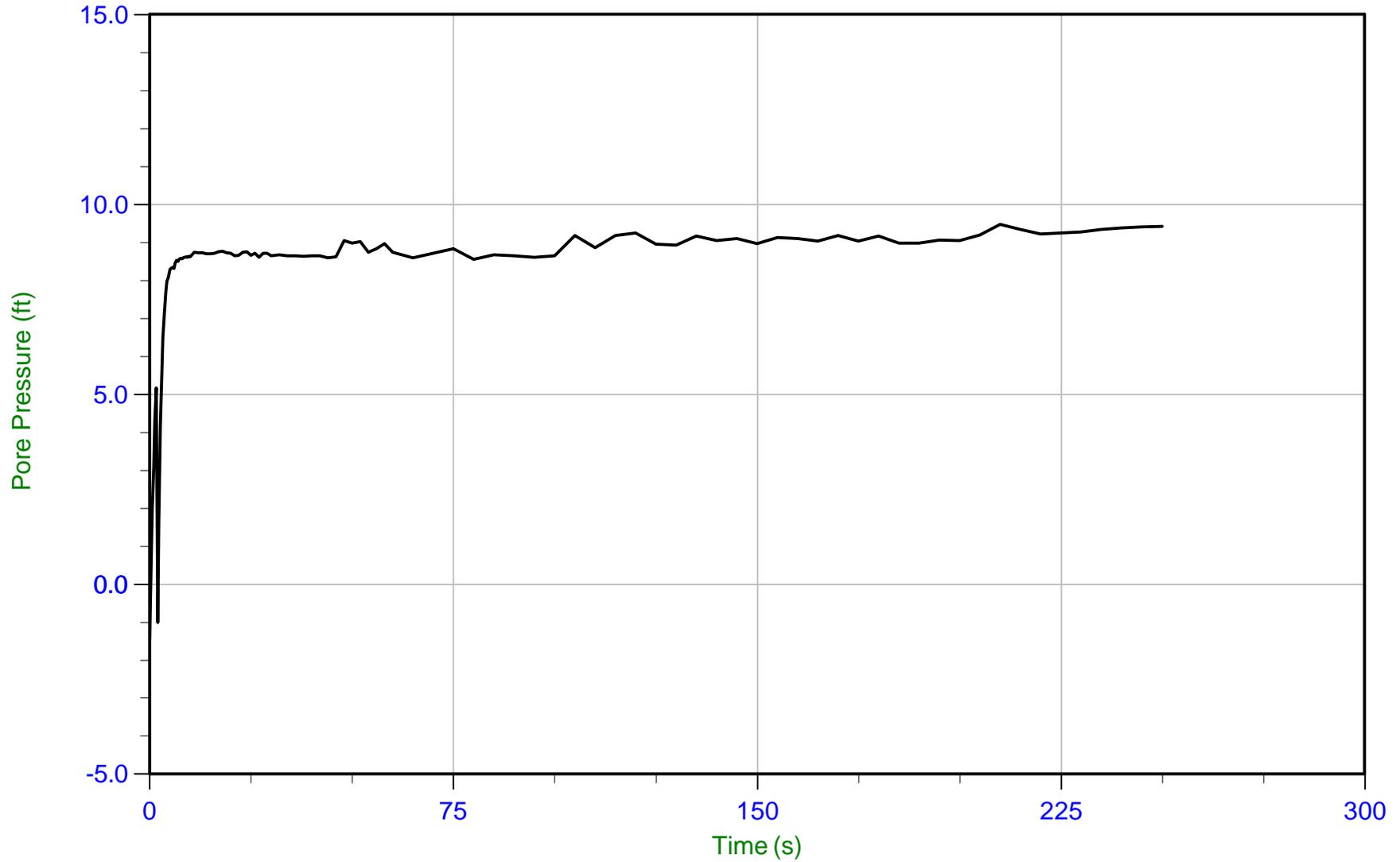
WT: 0.477 m / 1.564 ft  
Ueq: 9.6 ft



# GeoEngineers

Job No: 21-59-22493  
Date: 06/11/2021 08:23  
Site: Rex Development

Sounding: CPT-04  
Cone: 730:T1500F15U35 Area=15 cm<sup>2</sup>



### Trace Summary:

Filename: 21-59-22493\_CP04.ppd2  
Depth: 3.450 m / 11.319 ft  
Duration: 250.0 s

u Min: -1.5 ft  
u Max: 9.5 ft  
u Final: 9.4 ft

WT: 0.594 m / 1.949 ft  
Ueq: 9.4 ft

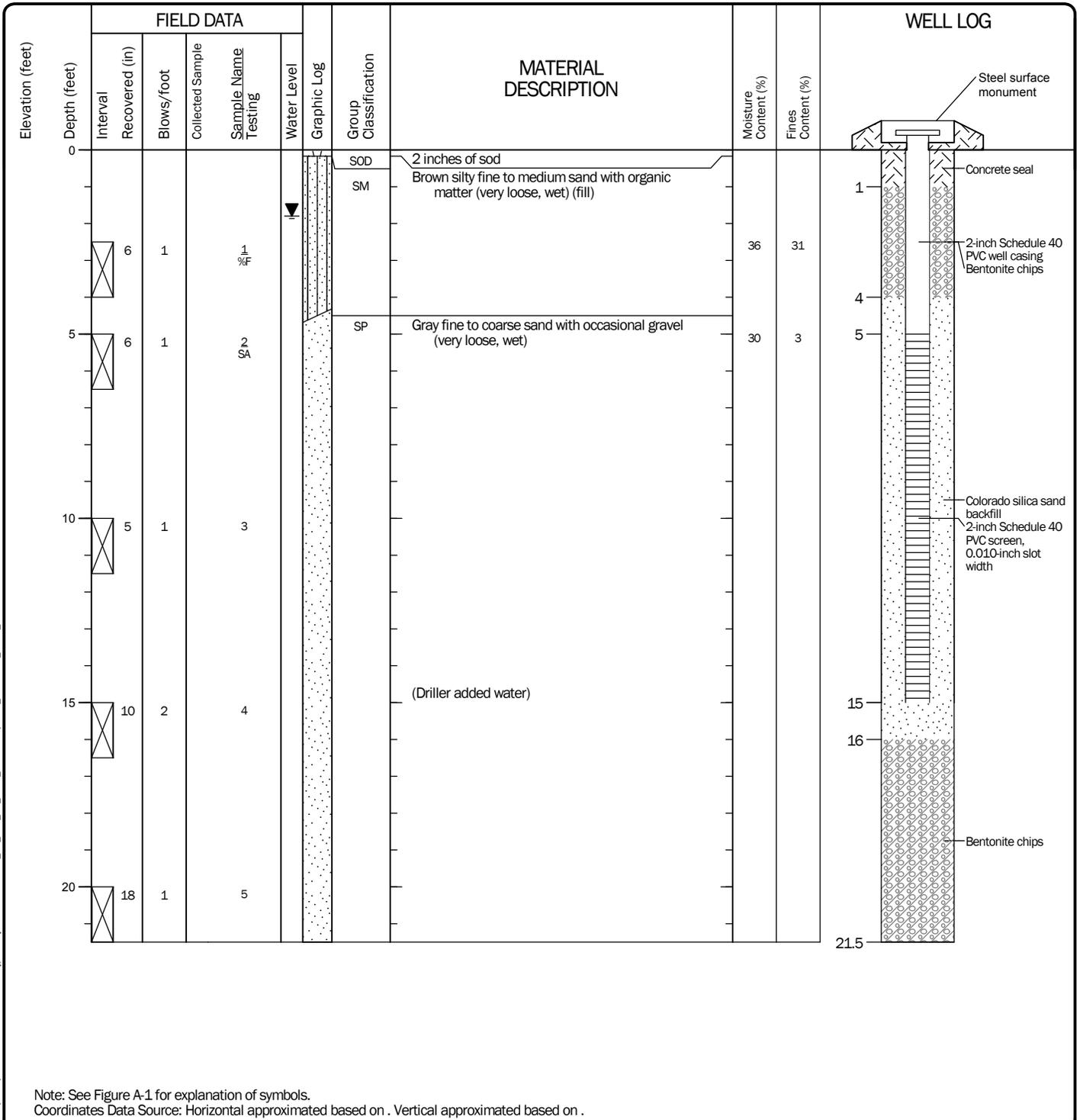
**APPENDIX C**  
**Logs from Previous Studies**

## **APPENDIX C PREVIOUS STUDIES**

GeoEngineers reviewed logs of previous explorations completed in the general vicinity of the currently planned project. The locations of previous explorations are shown on the Site Plan, Figure 2. The logs of the previous explorations are presented in this appendix and include the following:

- The logs of four borings (B-2 through B-5) completed in 2018 by GeoEngineers, Inc. in the report entitled “Geotechnical Engineering Services, 156<sup>th</sup> Street NE, 160<sup>th</sup> Street NE and 51<sup>st</sup> Avenue NE Improvements, Marysville, Washington.” Dated September 11, 2018.

|  |                  |  |                                       |   |   |
|--|------------------|--|---------------------------------------|---|---|
| Start<br>Drilled 4/12/2018                               | End<br>4/12/2018 | Total<br>Depth (ft)<br>21.5                      | Logged By<br>Checked By<br>CWM<br>CWM | Driller<br>Advanced Drilling<br>Technologies, Inc.  | Drilling<br>Method<br>Hollow-stem Auger |
| Hammer<br>Data<br>Autohammer                             |                  | Drilling<br>Equipment<br>Diedrich D-50 drill rig |                                       | DOE Well I.D.: BKP-229<br>A 2 (in) well was installed on 4/12/2018 to a depth of 21.5 (ft). |   |
| Surface Elevation (ft)<br>Vertical Datum<br>Undetermined |                  | Top of Casing<br>Elevation (ft)                  |                                       | Groundwater<br>Date Measured<br>4/26/2018   |   |
| Easting (X)<br>Northing (Y)                              |                  | Horizontal<br>Datum                              |                                       | Depth to<br>Water (ft)<br>1.80<br>Elevation (ft)  |   |
| Notes:   |                  |  |                                       |   |   |



Note: See Figure A-1 for explanation of symbols.  
Coordinates Data Source: Horizontal approximated based on . Vertical approximated based on .

### Log of Boring with Monitoring Well B-2



Project: City of Marysville - 156th, 160th and 51st  
Project Location: Marysville, Washington  
Project Number: 0925-017-00

Date: 7/24/18 Path: \\0.0925017.GINT\092501700.GPJ\DBLibrary\Library\GEOENGINEERS\_DF\_STD\_US\_JUNE\_2017\GLB\GERB\_GEO TECH\_WELL\_%F

|                                       |              |     |           |                  |              |  |     |            |                    |                         |                                      |                 |                   |
|---------------------------------------|--------------|-----|-----------|------------------|--------------|--|-----|------------|--------------------|-------------------------|--------------------------------------|-----------------|-------------------|
| Start Drilled                         | 4/12/2018    | End | 4/12/2018 | Total Depth (ft) | 16.5         | Logged By                                      | CWM | Checked By | CWM                | Driller                 | Advanced Drilling Technologies, Inc. | Drilling Method | Hollow-stem Auger |
| Surface Elevation (ft) Vertical Datum | Undetermined |     |           |                  | Hammer Data  | Autohammer                                     |     |            | Drilling Equipment | Diedrich D-50 drill rig |                                      |                 |                   |
| Easting (X) Northing (Y)              |              |     |           |                  | System Datum | See "Remarks" section for groundwater observed |     |            |                    |                         |                                      |                 |                   |
| Notes:                                |              |     |           |                  |              |  |     |            |                    |                         |                                      |                 |                   |

| Elevation (feet) | FIELD DATA   |                         |            |                  |                     | Graphic Log | Group Classification   | MATERIAL DESCRIPTION | Moisture Content (%) | Fines Content (%)   | REMARKS |
|------------------|--------------|-------------------------|------------|------------------|---------------------|-------------|--|----------------------|----------------------|---|---------|
|                  | Depth (feet) | Interval Recovered (in) | Blows/foot | Collected Sample | Sample Name Testing |             |  |                      |                      |   |         |
| 0                |              |                         |            |                  |                     | SOD         | 2 inches of sod  |                      |                      |   |         |
|                  |              |                         |            |                  |                     | SM          | Brown silty fine to medium sand with gravel and trace organic matter (loose, moist) (fill) |                      |                      |   |         |
|                  | 3            | 4                       |            | 1                | MC                  |             |  | 26                   |                      | Groundwater observed at approximately 3 feet below ground surface during drilling |         |
| 5                | 14           | 11                      |            | 2                |                     | SP-SM       | Gray fine to coarse sand with silt (medium dense, moist to wet) (recessional outwash)      |                      |                      |   |         |
|                  |              |                         |            |                  |                     | SM          | Gray silty fine to coarse sand with organic matter (medium dense, wet)                     |                      |                      |   |         |
| 10               | 12           | 16                      |            | 3                |                     |             |  |                      |                      |   |         |
|                  |              |                         |            |                  |                     | SP-SM       | Gray fine to coarse sand with silt (medium dense, wet)                                     |                      |                      |   |         |
| 15               | 15           | 12                      |            | 4                |                     |             |  |                      |                      | Driller added water   |         |

Note: See Figure A-1 for explanation of symbols.  
Coordinates Data Source: Horizontal approximated based on . Vertical approximated based on .

### Log of Boring B-3



Project: City of Marysville - 156th, 160th and 51st  
Project Location: Marysville, Washington  
Project Number: 0925-017-00

Date: 7/24/18 Path: P:\0\_0925017\_GINT\092501700.GPJ DBLibrary\Library\GEOENGINEERS\_DF\_STD\_US\_JUNE\_2017.GLB\GEB\_GEO TECH\_STANDARD\_%F\_NO\_GW

|                                       |              |     |           |                  |              |  |     |            |                    |                         |                                      |                 |                   |
|---------------------------------------|--------------|-----|-----------|------------------|--------------|--|-----|------------|--------------------|-------------------------|--------------------------------------|-----------------|-------------------|
| Start Drilled                         | 4/12/2018    | End | 4/12/2018 | Total Depth (ft) | 16.5         | Logged By                                      | CWM | Checked By | CWM                | Driller                 | Advanced Drilling Technologies, Inc. | Drilling Method | Hollow-stem Auger |
| Surface Elevation (ft) Vertical Datum | Undetermined |     |           |                  | Hammer Data  | Autohammer                                     |     |            | Drilling Equipment | Diedrich D-50 drill rig |                                      |                 |                   |
| Easting (X) Northing (Y)              |              |     |           |                  | System Datum | See "Remarks" section for groundwater observed |     |            |                    |                         |                                      |                 |                   |
| Notes:                                |              |     |           |                  |              |  |     |            |                    |                         |                                      |                 |                   |

| Elevation (feet) | FIELD DATA   |                         |            |                  |                     | Graphic Log | Group Classification   | MATERIAL DESCRIPTION | Moisture Content (%) | Fines Content (%)  | REMARKS |
|------------------|--------------|-------------------------|------------|------------------|---------------------|-------------|--|----------------------|----------------------|--|---------|
|                  | Depth (feet) | Interval Recovered (in) | Blows/foot | Collected Sample | Sample Name Testing |             |  |                      |                      |  |         |
| 0                |              |                         |            |                  |                     | SOD         | 2 inches of sod  |                      |                      |  |         |
|                  |              |                         |            |                  |                     | SM          | Brown silty fine to medium sand with occasional gravel and organic matter (medium dense, wet) (fill) |                      |                      |  |         |
|                  | 18           |                         | 10         |                  | 1A %F               |             |  | 43                   | 30                   | Groundwater observed at approximately 2½ feet below ground surface during drilling |         |
|                  |              |                         |            |                  | 1B                  | SP-SM       | Gray fine to medium sand with silt (medium dense, wet)   |                      |                      |  |         |
| 5                | 18           |                         | 9          |                  | 2 %F                |             | Becomes fine to coarse with gravel, becomes loose  | 19                   | 5                    |  |         |
|                  |              |                         |            |                  |                     |             |  |                      |                      |  |         |
| 10               | 18           |                         | 8          |                  | 3                   |             | Becomes without gravel   |                      |                      | Driller added water  |         |
|                  |              |                         |            |                  |                     |             |  |                      |                      |  |         |
| 15               | 15           |                         | 16         |                  | 4                   |             | Gray fine to medium sand with silt (medium dense, wet) (recessional outwash)                         |                      |                      | Driller added water  |         |

Note: See Figure A-1 for explanation of symbols.  
Coordinates Data Source: Horizontal approximated based on . Vertical approximated based on .

### Log of Boring B-4



Project: City of Marysville - 156th, 160th and 51st  
Project Location: Marysville, Washington  
Project Number: 0925-017-00

Figure A-5  
Sheet 1 of 1

Date: 7/24/18 Path: P:\0\_0925017\_GINT\092501700.GPJ DBLibrary\Library\GEOENGINEERS\_DF\_STD\_US\_JUNE\_2017.GLB\GEB\_GEO TECH\_STANDARD\_%F\_NO\_GW

|                                       |              |     |           |                  |  |           |     |                    |                         |         |                                      |                 |                   |
|---------------------------------------|--------------|-----|-----------|------------------|--|-----------|-----|--------------------|-------------------------|---------|--------------------------------------|-----------------|-------------------|
| Start Drilled                         | 4/13/2018    | End | 4/13/2018 | Total Depth (ft) | 21.5   | Logged By | CWM | Checked By         | CWM                     | Driller | Advanced Drilling Technologies, Inc. | Drilling Method | Hollow-stem Auger |
| Surface Elevation (ft) Vertical Datum | Undetermined |     |           | Hammer Data      | Autohammer                                     |           |     | Drilling Equipment | Diedrich D-50 drill rig |         |                                      |                 |                   |
| Easting (X) Northing (Y)              |              |     |           | System Datum     | See "Remarks" section for groundwater observed |           |     |                    |                         |         |                                      |                 |                   |
| Notes:                                |              |     |           |                  |  |           |     |                    |                         |         |                                      |                 |                   |

| Elevation (feet) | FIELD DATA   |                         |            |                  |                     | Graphic Log | Group Classification  | MATERIAL DESCRIPTION | Moisture Content (%) | Fines Content (%)  | REMARKS |
|------------------|--------------|-------------------------|------------|------------------|---------------------|-------------|---|----------------------|----------------------|--|---------|
|                  | Depth (feet) | Interval Recovered (in) | Blows/foot | Collected Sample | Sample Name Testing |             |   |                      |                      |  |         |
| 0                |              |                         |            |                  |                     | AC          | 8½ inches of asphalt concrete   |                      |                      |  |         |
|                  |              |                         |            |                  |                     | SP-SM       | Brown/black fine to coarse sand with silt and gravel (medium dense, moist) (fill) | 9                    | 6                    | Groundwater observed at approximately 4½ feet below ground surface during drilling |         |
| 5                | 12           | 10                      |            | 1 SA             |                     | SP-SM       | Gray fine to medium sand with silt (medium dense, wet) (recessional outwash)      |                      |                      |  |         |
|                  |              |                         |            |                  |                     |             |   |                      |                      |  |         |
| 10               | 12           | 12                      |            | 2                |                     |             |   |                      |                      |  |         |
|                  |              |                         |            |                  |                     |             |   |                      |                      |  |         |
| 15               | 18           | 13                      |            | 3                |                     |             | Becomes fine to coarse  |                      |                      | Driller added water  |         |
|                  |              |                         |            |                  |                     |             |   |                      |                      |  |         |
| 20               | 18           | 18                      |            | 4                |                     |             | Becomes fine to medium  |                      |                      | Driller added water  |         |
|                  |              |                         |            |                  |                     |             |   |                      |                      |  |         |
| 20               | 18           | 21                      |            | 5                |                     |             |   |                      |                      | Driller added water  |         |

Note: See Figure A-1 for explanation of symbols.  
Coordinates Data Source: Horizontal approximated based on . Vertical approximated based on .

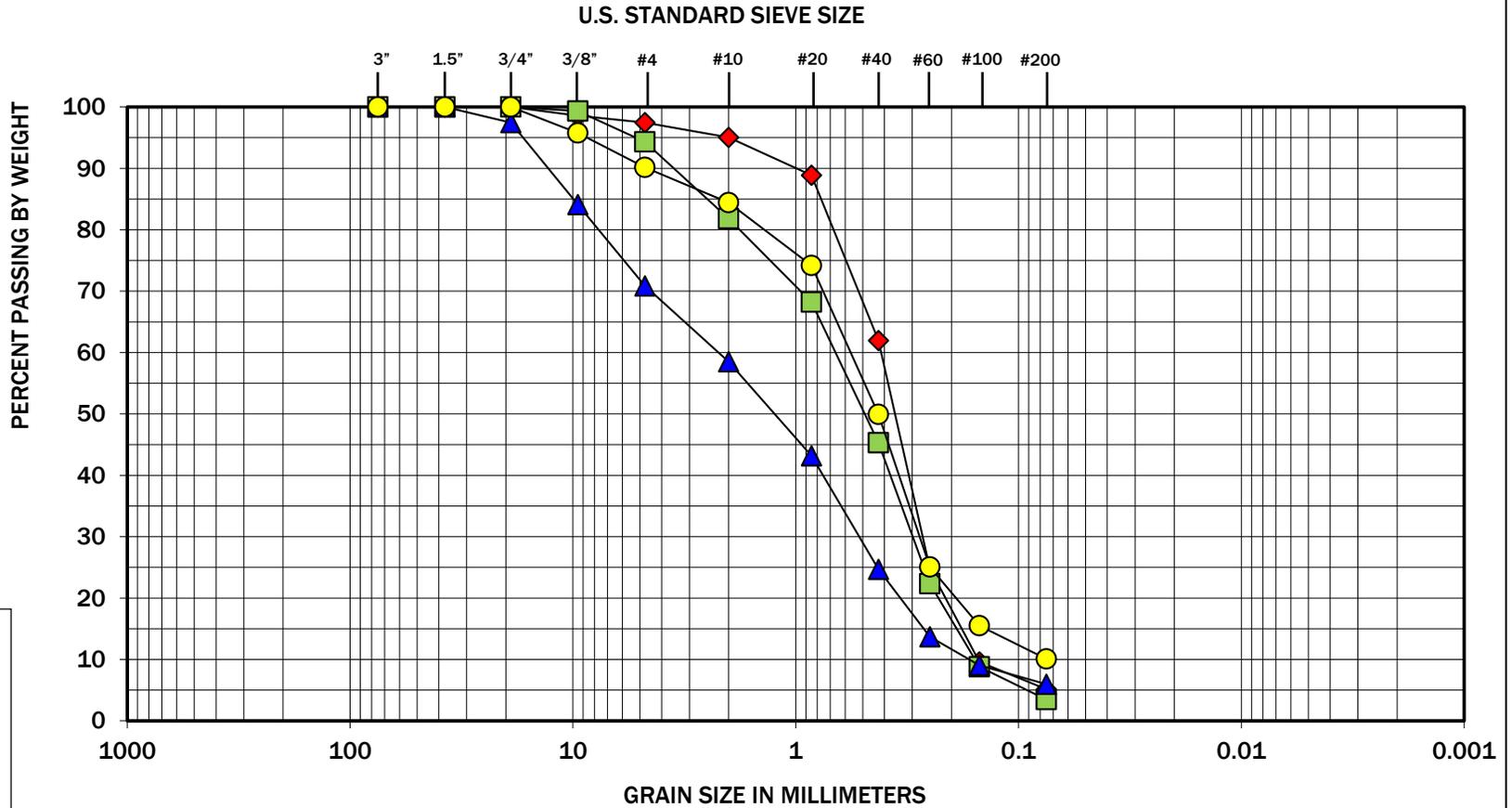
### Log of Boring B-5



Project: City of Marysville - 156th, 160th and 51st  
Project Location: Marysville, Washington  
Project Number: 0925-017-00

Figure A-6  
Sheet 1 of 1

Date: 7/24/18 Path: P:\0\_0925017\_GINT\092501700.GPJ\_DBLibrary\Library\GEOENGINEERS\_DF\_STD\_US\_JUNE\_2017.GLB\GEB\_GEO TECH\_STANDARD\_%F\_NO\_GW



| Symbol | Boring Number | Depth (feet) | Moisture (%) | Soil Description  |
|--------|---------------|--------------|--------------|---|
| ◆      | B-1           | 5            | 25           | Fine to medium sand with silt (SP-SM)                       |
| ■      | B-2           | 5            | 30           | Fine to coarse sand with occasional gravel (SP)             |
| ▲      | B-5           | 2.5          | 9            | Fine to coarse sand with silt and gravel (SP-SM)            |
| ●      | B-6           | 5            | 19           | Fine to medium sand with silt and occasional gravel (SP-SM) |

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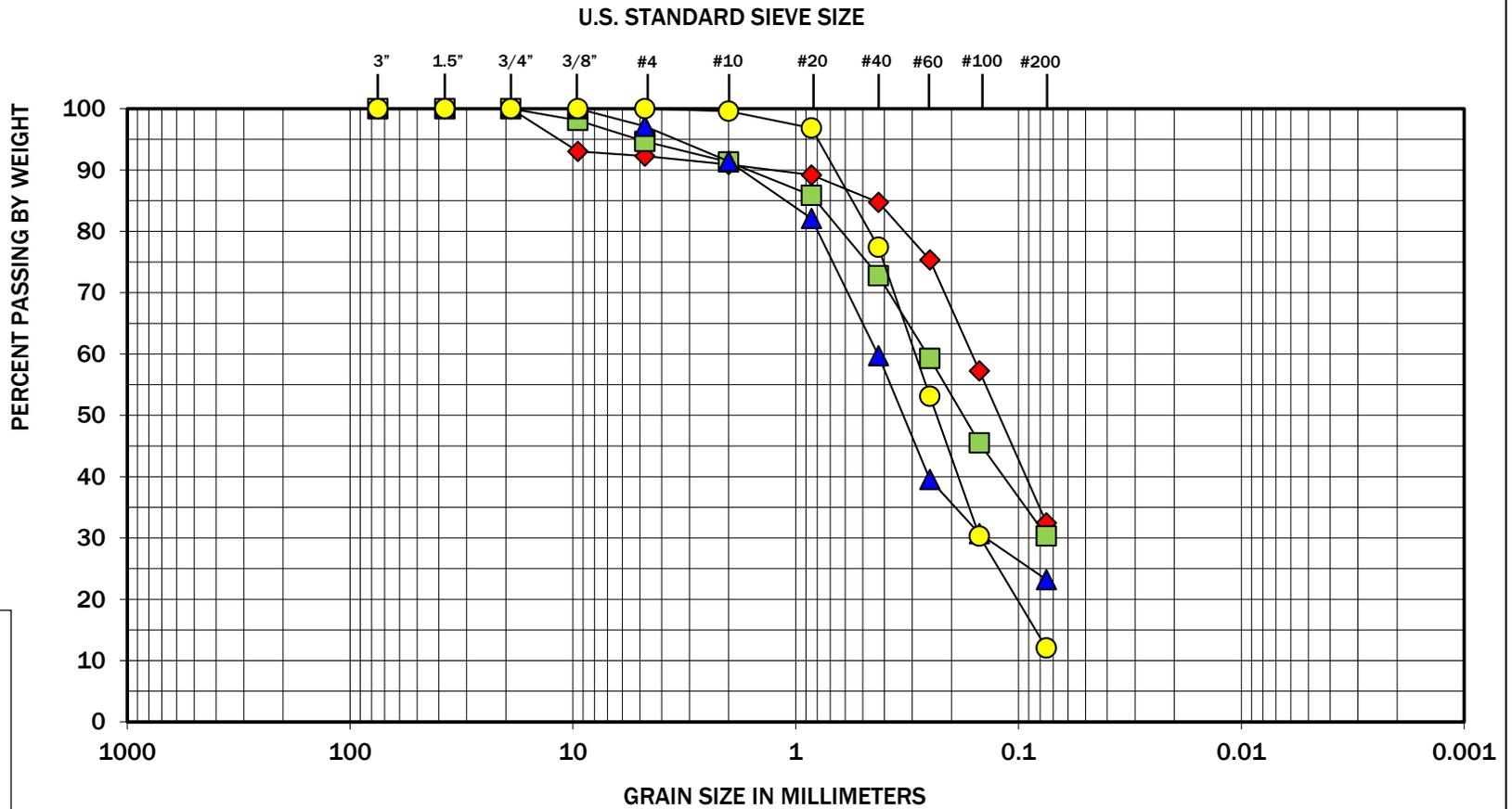
The grain size analysis results were obtained in general accordance with ASTM D 6913.



156<sup>th</sup> St NE, 160<sup>th</sup> St NE, and 51<sup>st</sup> Ave NE Improvements  
Marysville, Washington

**Sieve Analysis Results**

**Figure B-1**



|         |        |      |        |        |      |              |
|---------|--------|------|--------|--------|------|--------------|
| COBBLES | GRAVEL |      | SAND   |        |      | SILT OR CLAY |
|         | COARSE | FINE | COARSE | MEDIUM | FINE |              |

| Symbol | Boring Number | Depth (feet) | Moisture (%) | Soil Description                                      |
|--------|---------------|--------------|--------------|---|
| ◆      | B-1           | 2.5          | 30           | Silty fine sand with occasional gravel (SM)           |
| ■      | B-4           | 2.5          | 43           | Silty fine to medium sand with occasional gravel (SM) |
| ▲      | B-7           | 2.5          | 21           | Silty Fine to medium sand (SM)                        |
| ●      | B-10          | 2.5          | 25           | Silty fine to medium sand (SM)                        |

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The grain size analysis results were obtained in general accordance with ASTM D 6913.

**GEOENGINEERS**



**Figure B-2**

156<sup>th</sup> St NE, 160<sup>th</sup> St NE, and 51<sup>st</sup> Ave NE Improvements  
Marysville, Washington

**Sieve Analysis Results**

**APPENDIX D**  
**Report Limitations and Guidelines for Use**

## **APPENDIX D**

### **REPORT LIMITATIONS AND GUIDELINES FOR USE**

This appendix provides information to help you manage your risks with respect to the use of this geotechnical data report. This report does not include design recommendations.

#### **Report Use and Reliance**

The geotechnical data report has been prepared for Williams Investments LLC. The report is not intended for use by others, and the information contained herein is not applicable to other projects or properties. No party or parties other than those named above may rely on the product of our services unless we agree to such reliance in advance and in writing. The purpose of this limitation is to provide our firm with reasonable protection against open-ended liability claims by third parties with whom there would otherwise be no contractual limits to their actions.

This geotechnical data report is intended to be used only for the specific purpose or project originally contemplated for our services and use of this report is not recommended for any other purpose or project. The data was developed and compiled for this project only, and no representation or warranty is made, either express or implied. GeoEngineers shall not be responsible for any alterations, modifications or additions to the data herein or the consequences of any interpretations of the data. Any use of the data, including any conclusion or information obtained or derived from the use of the data, other than by Williams Investments LLC, their authorized agents and regulatory agencies for the specific purpose or project originally contemplated for our services will be at the user's sole risk.

If changes are made to the project or property after the date of the report, we recommend that GeoEngineers be given the opportunity to review the data, and then we can provide written modifications or confirmation, as appropriate.

#### **Information Provided by Others**

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# WETLAND DELINEATION, GROUNDWATER MONITORING, AND FISH AND WILDLIFE HABITAT ASSESSMENT REPORT

---

## REX DEVELOPMENT

REVISED APRIL 2022

JANUARY 2021



**Soundview  
Consultants**  
Environmental Assessment  
Planning + Land Use Solutions

# WETLAND DELINEATION, GROUNDWATER MONITORING, AND FISH AND WILDLIFE HABITAT ASSESSMENT REPORT

---

## REX DEVELOPMENT

REVISED APRIL 6, 2022

JANUARY 2021

### PROJECT LOCATION

15808 AND 16204 51<sup>ST</sup> AVENUE NORTHEAST  
MARYSVILLE, WASHINGTON 98271

### PREPARED FOR

#### WILLIAMS INVESTMENTS

ATTN: RYAN KILBY  
2517 COLBY AVENUE  
EVERETT, WASHINGTON 98201

### PREPARED BY

SOUNDVIEW CONSULTANTS LLC  
2907 HARBORVIEW DRIVE, SUITE D  
GIG HARBOR, WASHINGTON 98335  
(253) 514-8952



**Soundview  
Consultants**  
Environmental Assessment  
Planning + Land Use Solutions

## Executive Summary

Soundview Consultants LLC (SVC) is assisting Williams Investments (Applicant) with a Wetland Delineation, Groundwater Monitoring, and Fish and Wildlife Habitat Assessment Report on a 135-acre site located at 15808 and 16204 51st Avenue Northeast, in the City of Marysville, Washington. The subject property consists of two parcels situated in the Southeast ¼, of Section 28, Township 31 North, Range 5 East, W.M (Snohomish County Tax Parcel Numbers 31052800400100 and 31052800400400).

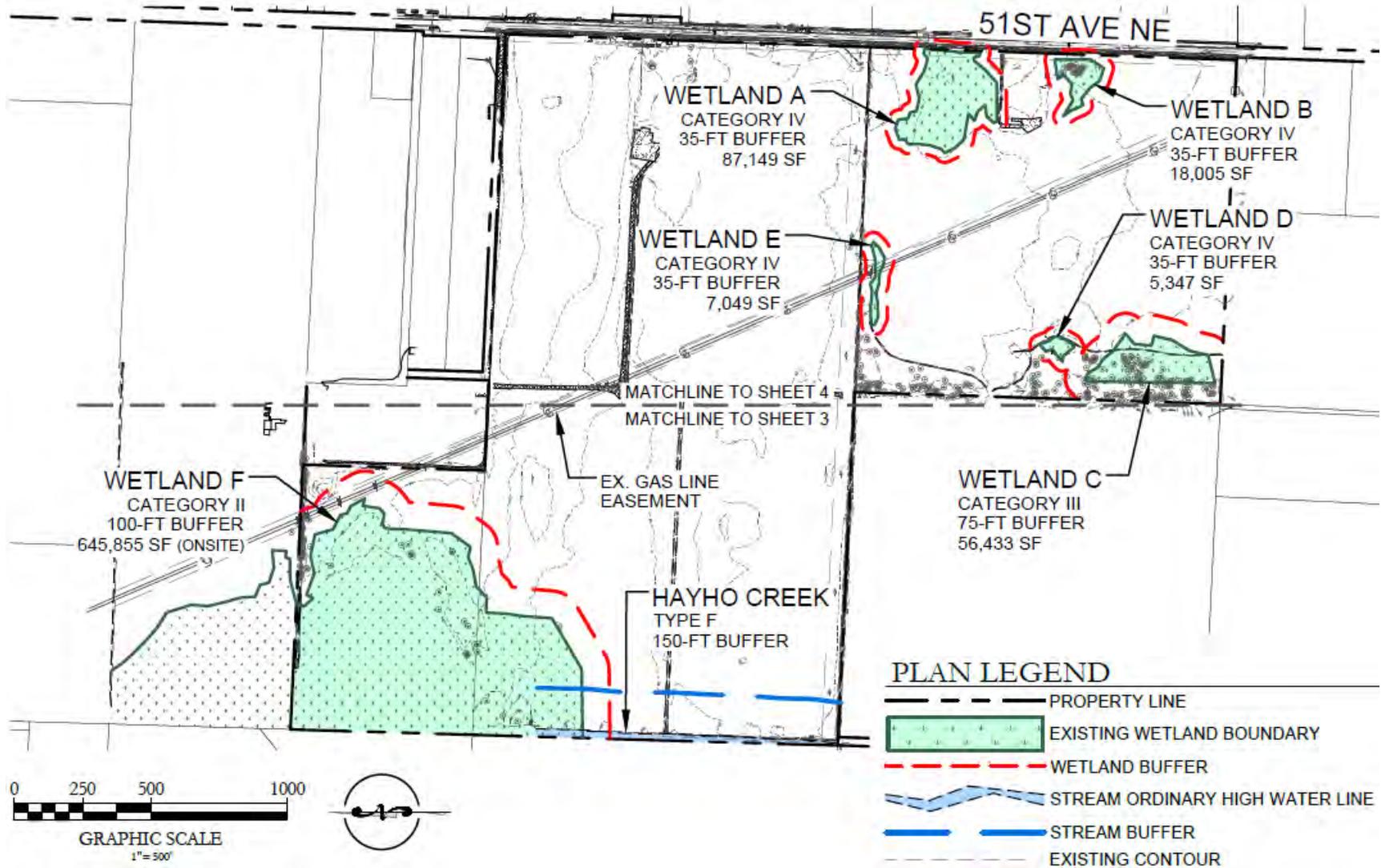
SVC conducted a wetland delineation, groundwater monitoring, and fish and wildlife habitat field assessment in 2018 and 2020. An initial site investigation was conducted in early February 2018 and identified highly disturbed soil and vegetation conditions due to ongoing agricultural practices throughout most of the subject property. Following wetland delineation methodology for disturbed site conditions, forty-two groundwater monitoring observation wells were installed and monitored from early March 2018 to early June 2018. Observations of water table elevations were compared with precipitation data to determine where wetland hydrologic conditions were present on the subject property. These wetland hydrologic conditions were used to inform wetland delineations where soil and vegetation conditions were highly disturbed. Follow-up site investigations were completed in May and December 2020 to confirm the prior wetland delineations and assessments. The site investigations identified and delineated six potentially-regulated onsite wetlands (Wetlands A through F) in June 2018. Wetlands A, B, D, and E are Category IV depressional wetlands with standard 35-foot buffers under Marysville Municipal Code (MMC) 22E.010.100.4. Wetland C is a Category III depressional wetland with a standard 75-foot buffer. Wetland F is a Category II depressional wetland with a standard 100-foot buffer. One stream (Hayho Creek) was identified onsite along the western boundary of the subject property. Hayho Creek is a Type F stream with a 150-foot buffer under MMC 22E.010.220.1.a. Two non-regulated, linear, excavated, agricultural ditches were observed onsite. Potential offsite wetlands were observed to the west of the northern portion of the subject property. No other potentially-regulated wetlands or fish and wildlife habitat were identified within 300 feet of the subject property. This report has been revised to include the Approved Jurisdictional Determination (AJD) for the identified critical areas.

The table below identifies the wetlands and stream observed during the site investigation and summarizes the potential regulatory status by local, state, and federal agencies.

| Wetland/<br>Waterbody | Size/Length<br>(onsite) | Category <sup>1</sup> or<br>Type <sup>2</sup> | Regulated under<br>MMC 22E.010 | Regulated under<br>RCW 90.48 | Regulated under<br>Section 404 of the<br>CWA |
|-----------------------|-------------------------|---|--------------------------------|------------------------------|--|
| Wetland A             | 87,149 SF               | IV  | Yes                            | Yes                          | No   |
| Wetland B             | 18,005 SF               | IV  | Yes                            | Yes                          | No   |
| Wetland C             | 56,433 SF               | III   | Yes                            | Yes                          | No   |
| Wetland D             | 5,347 SF                | IV  | Yes                            | Yes                          | No   |
| Wetland E             | 7,049 SF                | IV  | Yes                            | Yes                          | No   |
| Wetland F             | 645,855 SF              | II  | Yes                            | Yes                          | No   |
| Hayho Creek           | ~2,000 linear<br>feet   | F   | Yes                            | Yes                          | No   |

1. Current Washington State Department of Ecology (WSDOE) wetland rating (Hruby, 2014) per MVMC 15.040.090.C.1.
2. DNR Water Typing system per MMC 22E.010.060.1.

# Site Map



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- Appendix B — Background Information
- Appendix C — Existing Conditions Map
- Appendix D -- USACE Approved Jurisdictional Determination
- Appendix E — Data Sheets
- Appendix F — Wetland Rating Forms
- Appendix G — Wetland Rating Maps
- Appendix H — Monitoring Well Photos
- Appendix I — Monitoring Well and Precipitation Summary
- Appendix J — Qualifications

# Chapter 1. Introduction

---

Soundview Consultants LLC (SVC) is assisting Williams Investments (Applicant) with a Wetland Delineation, Groundwater Monitoring, and Fish and Wildlife Habitat Assessment Report on a 135-acre site located at 15808 and 16204 51st Avenue Northeast in the City of Marysville, Washington. The subject property consists of two parcels situated in the Southeast  $\frac{1}{4}$ , of Section 28, Township 31 North, Range 5 East, W.M (Snohomish County Tax Parcel Numbers 31052800400100 and 31052800400400).

The purpose of this Wetland Delineation, Groundwater Monitoring, and Fish and Wildlife Habitat Assessment Report is to identify the presence of potentially-regulated wetlands, waterbodies, fish and wildlife habitat, and/or priority species that may be found on or near the subject property.

This report provides conclusions and recommendations regarding:

- Site description and areas of assessment;
- Background research, identification, and assessment of potentially-regulated wetlands and fish and wildlife habitat and/or species in the vicinity of the proposed project;
- Standard buffer recommendations, building setbacks, and development limitations;
- Existing site map detailing potentially-regulated wetlands and standard buffers;
- Proposed site plan with proposed project details; and
- Supplemental information necessary for local, state, and federal regulatory review.

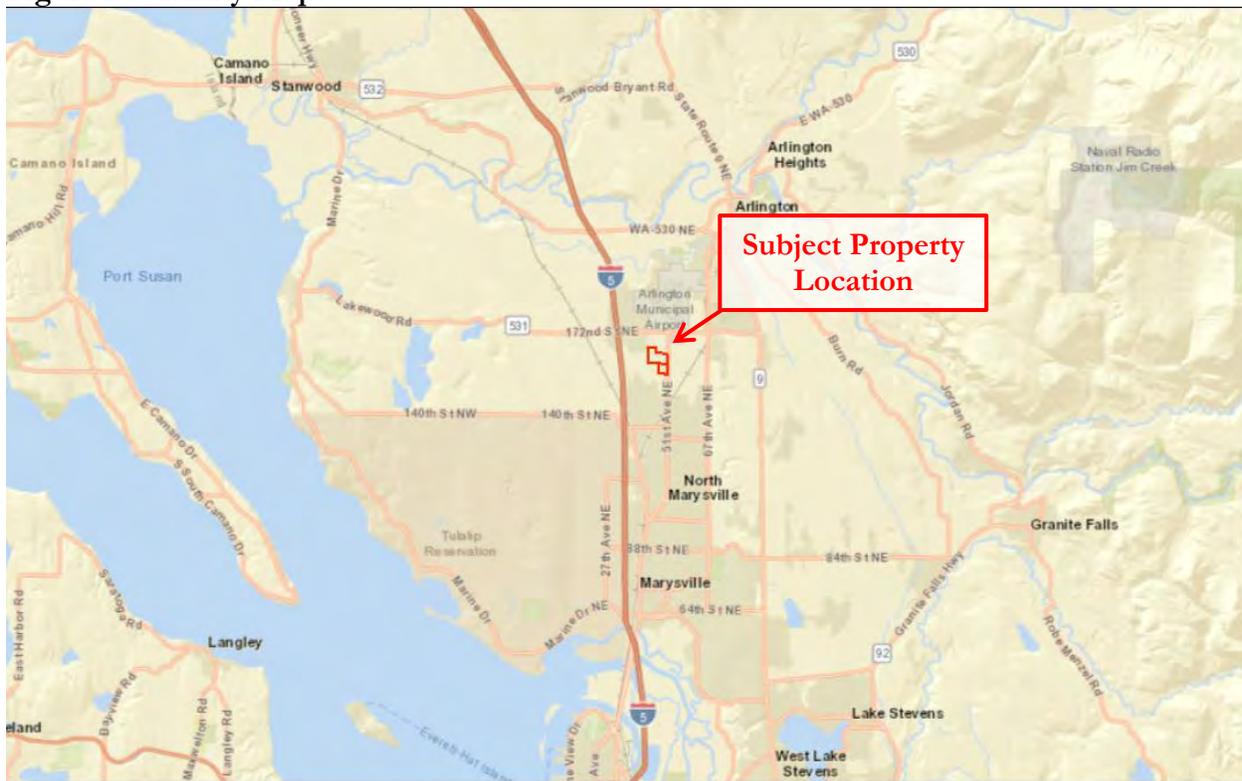
# Chapter 2. Proposed Project

## 2.1 Location

The subject property is located at 15808 and 16204 51st Avenue Northeast in the City of Marysville, Washington. The subject property consists of two parcels situated in the Southeast ¼, of Section 28, Township 31 North, Range 5 East, W.M (Snohomish County Tax Parcel Numbers 31052800400100 and 31052800400400).

To access the subject property from I-5 North from Everett, take Exit 206 for WA-531 towards Lakewood/Smokey Point. Turn right on WA-531/172<sup>nd</sup> Street Northeast/Edgecomb Road and continue for 1.2 miles. Turn right on 51st Avenue Northeast/Shoultes Road and proceed for 0.6 mile. The subject property will be on the right.

Figure 1. Vicinity Map.



1/25/2018, 11:53:53 AM

Snohomish\_Parcels\_Query result



Soundview Consultants

## 2.2 Proposed Project

The purpose of this report is to assess the feasibility of potential future development on the subject property.

## Chapter 3. Methods

---

SVC conducted multiple site investigations and weekly groundwater monitoring on the subject property. The initial site investigation was conducted on February 1, 2018; wetland delineation was conducted on June 19, 20, and 21, 2018; and a follow-up site assessment was conducted on August 10, 2018. Groundwater monitoring was conducted from March 1, 2018 to June 5, 2018. An additional follow up site investigation was conducted on May 19 and 21, 2020 and December 16, 2020. Prior to the initial site investigation, staff conducted background research using Snohomish County Geographic Information System (GIS) data, Washington Department of Fish and Wildlife (WDFW) Priority Habitat and Species (PHS) and SalmonScape mapping tools, U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI), Washington Department of Natural Resources (DNR) water typing system, and Natural Resource Conservation Service (NRCS) soil survey. All determinations were made using observable vegetation, hydrology, and soils in conjunction with data from the U.S. Geological Survey (USGS) topographic maps, USFWS, local precipitation data, and various orthophotographic resources. Appendix A contains further details for the methods and tools used to prepare this report.

The initial site investigation consisted of a walk-through survey of the subject property and accessible areas within 150 feet of this area for potentially-regulated wetlands, waterbodies, fish and wildlife habitat, and/or priority habitat species as specified in the Marysville Municipal Code (MMC) Chapter 22E.010 (Critical Areas Management). The fish and wildlife habitat assessment was conducted during the initial site visit by a qualified fish and wildlife biologist. The experienced biologist made visual observations using stationary and walking survey methods for both aquatic and upland habitats, noting any special habitat features or signs of fish and wildlife activity.

On highly disturbed or problematic sites, direct hydrologic monitoring may be needed to determine whether wetland hydrology is present. The USACE provides a technical standard for monitoring hydrology on such sites. The regional hydrologic standard requires 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 out of 10 (50 percent or higher probability) (National Research Council, 1995).

To evaluate wetland hydrology according to this criterion, trained SVC staff set up forty-two monitoring locations (MP-1 to MP-42) across the subject property. One monitoring well was installed at each monitoring location with the exceptions of MP-35, MP-36 and MP 38. These three locations were ponded during the initial well installation and remained ponded throughout much of the monitoring period. Ponded water depth in these locations was measured using a measuring tape. When the water table dropped below the ground surface in these locations, holes were dug to measure the water table elevation. Each monitoring well was constructed of a 5-foot length of 2-inch diameter polyvinyl chloride (PVC) pipe with narrow slits extending 24 inches from one end. Each monitoring well was capped at each end with the lower cap fixed and perforated and an upper inspection cap with tamper-resistant locking mechanism. Each monitoring well was installed to a depth of approximately 36 inches, surrounded by sand to 3 inches above the top slits. Each monitoring well was then packed with native soil and topped with a Bentonite seal. The monitoring wells at locations MP-1 through MP-38 were installed on March 1 and 2, 2018. The monitoring wells at locations MP-39 through MP-42 were installed on March 20, 2018 due to ongoing agricultural activities (see Appendix C for a site

map with monitoring well locations and Appendix H for photographs of representative monitoring wells installed in upland and wetland locations).

Water level measurements were collected from each monitoring well on a weekly basis (every 6 to 8 days) from March 6 to June 5, 2018 by qualified SVC staff. The purpose of this monitoring was to determine the depth of near-surface water levels during the growing season in relation to precipitation events.

Data from the monitoring wells were compared with precipitation data in order to determine the likelihood of wetland hydrology. Precipitation data used in this assessment was collected by the National Oceanic and Atmospheric Administration's (NOAA) National Weather Service at the Seattle-Tacoma International Airport in Seatac, Washington. Closer weather stations were not chosen due to incomplete observation data at those stations, and a dependable precipitation data set is required throughout the monitoring period. Wetland hydrology was considered met during the site investigation when water levels were observed to be within 12 inches of the surface for at least two consecutive weeks during the monitoring period.

Wetland boundaries were determined using the approach described in the U.S. Army Corps of Engineers (USACE) *Wetlands Delineation Manual* (Environmental Laboratory, 1987) and modified according to the guidelines established in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (Version 2.0) (USACE, 2010). Qualified wetland scientists marked boundaries of onsite wetlands with orange surveyor's flagging labeled alpha-numerically and tied to 3-foot lath or vegetation along the wetland boundary. Pink surveyor's flagging was labeled alpha-numerically and tied to 3-foot lath or vegetation at formal sampling locations to mark the points where detailed data was collected. DP-1 through DP-42 were collected at the monitoring well locations MP-1 through MP-42 at the time of monitoring well installation. Data was not collected at MP-35, MP-36 and MP 38 as these locations were ponded at the time of monitoring well installation and remained so for much of the field assessment period. DP-43 through DP-52 were collected at the time of wetland delineation to verify wetland and upland conditions. Additional tests pits were excavated at regular intervals inside and outside of the wetland boundaries to further confirm each delineation.

SVC classified all wetlands using both the hydrogeomorphic (Brinson, 1993) and Cowardin (Cowardin, 1979) classification systems. Following classification and assessment, WSDOE-trained scientists rated and categorized all wetlands using the *Washington State Wetlands Rating System for Western Washington* (Hruby, 2014) and the definitions established in MMC 22E.010.060.1.

Ordinary High Water Mark (OHW) determinations were made using WSDOE's method as detailed in *Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State* (Anderson et al., 2016) and the definitions established in the Revised Code of Washington (RCW) 90.58.030(2)(b) and Washington Administrative Code (WAC) 173-22-030(11). To mark the centerline or banks of potentially-regulated streams, blue surveyor's flagging was alpha-numerically labeled and tied to vegetation. Streams and surface water features were classified using the DNR water typing system as outlined in WAC 222.16 and the guidelines established in MMC 22E.010.210.1.

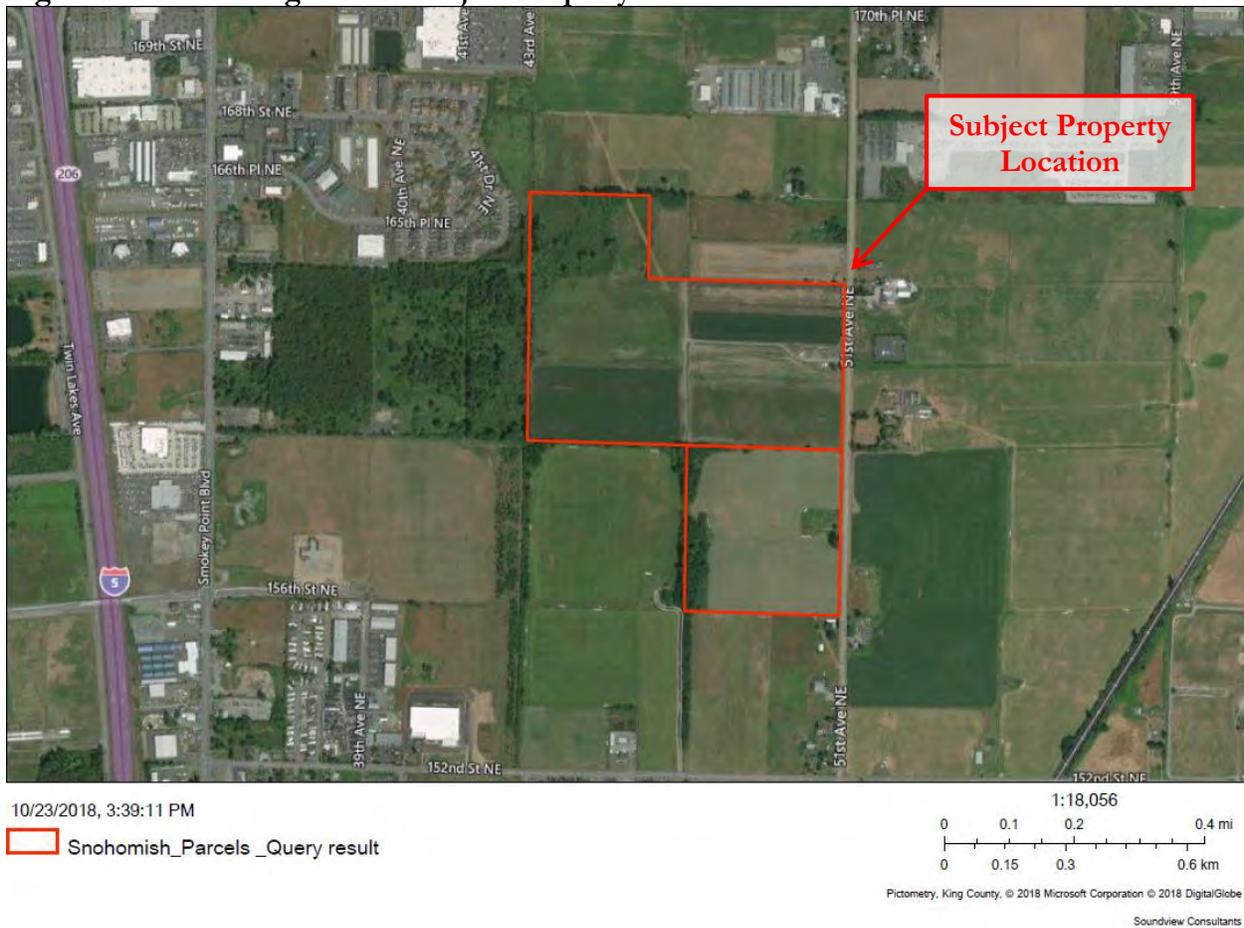
# Chapter 4. Background

## 4.1 Landscape Setting

The subject property is located in the City of Marysville in an agricultural setting (Figure 2). The subject property is actively used for agriculture. 51st Avenue Northeast borders the subject property to the east. Adjacent parcels to the north and south of the subject property consist of land for single-family residential and agricultural uses. Adjacent parcels to the west of the subject property consist of agricultural land, undeveloped land, and single-family residential land.

The study area is within the Snohomish watershed (Water Resources Inventory Area 7). Topography on the site is flat (Appendix B1).

**Figure 2. Aerial Image of the Subject Property.**



## 4.2 Vegetation

The subject property has been used for agricultural crop and sod production. The northeast fields on the northern parcel of the subject property were in sod production during the site investigations. No other crops or sod were being grown during the site investigations, groundwater monitoring, or wetland delineation. Corn stalks from a 2017 harvest are present on the southern parcel. Herbaceous

vegetation emerged on this southern parcel during spring and summer 2018; the vegetation is dominated by common velvetgrass (*Holcus lanatus*) and colonial bentgrass (*Agrostis capillaris*). The northern parcel has been rotated through crop and sod production. The southern fields of the northern parcel are dominated by alsike clover (*Trifolium hybridum*), common velvetgrass, bird's-foot trefoil (*Lotus corniculatus*), American vetch (*Vicia americana*), and Canada thistle (*Cirsium arvense*). The northwest fields of the northern parcel are dominated by Scouler's willow saplings (*Salix scouleriana*), colonial bentgrass, common velvetgrass, orchard grass (*Dactylis glomerata*) and oxeye daisy (*Leucanthemum vulgare*). Forested patches are present along the western boundaries of the southern and northern parcels. These patches are dominated by red alder (*Alnus rubra*), black cottonwood (*Populus balsamifera*), quaking aspen (*Populus tremuloides*), twinberry (*Lonicera involucrata*), salmonberry (*Rubus spectabilis*), lady fern (*Athyrium cyclosorum*), and Himalayan blackberry (*Rubus armeniacus*).

### 4.3 Soils

The NRCS soil survey identifies three soil series on the subject property: Custer fine sandy loam, Mukilteo muck, and Norma loam. An NRCS soil survey map is provided in Appendix B3.

#### **Custer fine sandy loam (13)**

According to the NRCS survey, Custer fine sandy loam is a very deep, poorly drained soil formed in glacial outwash. In a typical profile, the surface layer is about 9 inches thick and consists of a dark grayish brown fine sandy loam. The upper subsoil is about 7 inches thick and consists of a loamy fine sand. The lower subsoil is about 19 inches thick and consists of gray and olive sand with iron-cemented concretions that form a discontinuous hardpan. This soil is listed as hydric by NRCS.

#### **Mukilteo muck (34)**

According to the NRCS survey, Mukilteo muck is a very deep, poorly drained soil that is formed predominantly by sedges. Permeability is moderate and water capacity is high. In a typical profile, the surface layer is about 4 inches thick and consists of a dark reddish-brown muck. The next layer is dark reddish brown to black organic material about 31 inches thick, followed by a black organic layer about 20 inches thick. The bottom layer to a depth of 60 inches or greater consists of an olive gray fine sandy loam. Large amounts of woody material are common. This soil is considered hydric by NRCS.

#### **Norma loam (39)**

According to the NRCS survey, Norma loam is a deep, poorly drained soil formed in alluvium. In a typical profile, the surface layer is very dark gray loam about 10 inches thick. The subsoil is dark grayish brown sandy loam about 18 inches thick. The substratum is a dark gray sandy loam to a depth of 60 inches or more. This soil is listed as hydric by NRCS.

### 4.4 Stream and Wetland Inventories

The USFWS NWI map (Appendix B2) identifies potential wetland areas in the northwest corner of the subject property and along the western boundary of the subject property. Additional offsite potential wetland areas are associated with potential streams or ditches to the south and east of the subject property. The Snohomish County wetlands inventory map (Appendix B4) also identifies potential wetland area on the northwest corner and western portion of the subject property; this potential wetland area extends offsite to the west and northwest. The DNR stream typing map (Appendix B8) identifies Type N waterbodies on the western portion of the property, including along

the western property boundary. An offsite Type N waterbody is located across 51st Avenue Northeast to the east, and an offsite Type F waterbody is located to the south of the subject property. The Snohomish County stream inventory map (Appendix B5) also identifies these features, except for the waterbody located across 51st Avenue Northeast to the east.

#### 4.5 Priority Habitats and Species

The WDFW PHS map (Appendix B4) identifies the potential wetlands extending northwest and west from the subject property. This WDFW PHS map identifies occurrence and migration of Dolly Varden/bull trout (*Salvelinus malma*), coastal cutthroat (*Oncorhynchus clarkii*), chum salmon (*Oncorhynchus keta*), and coho (*Oncorhynchus kisutch*) in the stream along the western boundary of the subject property. The WDFW Salmonscape map (Appendix B7) identifies the presence of Dolly Varden/bull trout and coho as presumed and the presence of chinook salmon (*Oncorhynchus tshawytscha*), pink salmon (*Oncorhynchus gorbuscha*), and steelhead trout (*Oncorhynchus mykiss*) as modeled in the stream along the western boundary of the subject property. Additionally, the WDFW Salmonscape map identifies modeled presence of pink salmon, chinook salmon, coho salmon (*Oncorhynchus kisutch*), chum salmon (*Oncorhynchus keta*), and steelhead trout in the stream located across 51st Avenue Northeast to the east.

#### 4.6 Precipitation

Precipitation data was obtained from the National Oceanic and Atmospheric Administration (NOAA) weather station at Seattle-Tacoma International Airport in order to obtain precipitation values during and preceding the field investigations for the initial site investigation, monitoring well installation, wetland delineations, and follow-up site assessment. A summary of this data collected is provided in Table 1. Precipitation data for the monitoring well observations visits is provided in Appendix I.

**Table 1. Precipitation Summary<sup>1</sup>.**

| Date     | Day Of | Day Before     | 1 Week Prior | 2 Weeks Prior | Last 30 days (Observed/Normal) | Year-to-Date <sup>2</sup> (Observed/Normal) | Percent of Normal (prior 30 days/year) |
|----------|--------|----------------|--------------|---------------|--------------------------------|---|--|
| 12/16/20 | 0.49   | 0.42           | 1.42         | 2.18          | 4.62/6.25                      | 10.34/12.92                                 | 74/80.03                               |
| 5/21/20  | 0.36   | 0.03           | 1.17         | 1.23          | 3.28/2.08                      | 33.13/32.21                                 | 158/103                                |
| 5/19/20  | 0.00   | 0.00           | 0.83         | 0.95          | 2.89/2.13                      | 32.74/32.09                                 | 136/102                                |
| 08/10/18 | 0.00   | 0.00           | 0.01         | 0.03          | 0.03/0.61                      | 38.10/35.31                                 | 5/108                                  |
| 06/21/18 | 0.00   | 0.00           | 0.00         | 0.42          | 0.43/1.85                      | 37.82/34.06                                 | 23/111                                 |
| 06/20/18 | 0.00   | 0.00           | 0.02         | 0.42          | 0.43/1.86                      | 37.82/34.01                                 | 23/111                                 |
| 06/19/18 | 0.00   | 0.00           | 0.02         | 0.42          | 0.43/1.87                      | 37.82/33.91                                 | 23/112                                 |
| 03/02/18 | 0.18   | 0.03           | 0.66         | 1.19          | 2.37/3.93                      | 29.35/24.60                                 | 60/119                                 |
| 03/01/18 | 0.03   | U <sup>3</sup> | 0.48         | 1.02          | 2.19/3.94                      | 29.17/24.60                                 | 56/119                                 |
| 02/01/18 | 0.57   | T <sup>3</sup> | 0.83         | 0.57          | 8.77/5.47                      | 27.55/21.10                                 | 160/131                                |

Notes:

1. Precipitation volume in inches. Data obtained from the NOAA (<http://w2.weather.gov/climate/xmacis.php?wfo=sew>) for SeaTac International Airport.
2. Year-to-date precipitation is the total for the water year from October 1<sup>st</sup> to the onsite date(s).
3. U = Unknown amount. T = Trace amount.

During the site reconnaissance visit on February 1, 2018, precipitation levels were significantly above statistical normal (160.32 percent of normal) for the prior 30 days and significantly above statistical normal (130.56 percent of normal) for the water year. This precipitation data suggests that wetter than normal conditions were encountered at the time of the site reconnaissance.

During the monitoring well installation visits on March 1 and 2, 2018, precipitation levels were significantly below statistical normal (55.58 to 60.30 percent of normal) for the prior 30 days and significantly above statistical normal (118.57 to 119.30 percent of normal) for the water year. However, over an inch of rain was recorded within the two weeks prior to the monitoring well installation.

During the wetland delineation visits on June 19, 20, and 21, 2018, precipitation levels were significantly below statistical normal (22.99 to 23.24 percent of normal) for the prior 30 days and above statistical normal (111.53 to 111.04 percent of normal) for the water year.

During the site assessment on August 10, 2018, precipitation levels were significantly below statistical normal (4.92 percent of normal) for the prior 30 days and slightly above statistical normal (107.90 percent of normal) for the water year.

During the follow-up site investigations in May 2020, precipitation levels were significantly above the statistical normal (158 and 136 percent of normal) and near the statistical normal for the water year (103 and 102 percent of normal). During the follow-up site visit on December 16, 2020, precipitation levels were below the statistical normal (approximately 74 percent of normal) for the prior 30 days and within the statistical normal range (approximately 80 percent of normal) for the water year. 2.18 inches of precipitation occurred during the two weeks prior to the site visit, approximately half of the precipitation that occurred during the prior 30 days.

## Chapter 5. Results

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The initial site investigation in February 2018 revealed that the highly disturbed conditions were present on the subject property due to the ongoing agricultural use of the site. Wet conditions were observed in several locations across the subject property. Due to the highly disturbed conditions, soils and vegetation were not considered reliable indicators of wetland conditions across the entire subject property. Groundwater monitoring from early March to early June 2018 observed water table elevation responses to precipitation during the growing season. Nine out of 42 groundwater monitoring locations met the wetland hydrology criterion; this result informed boundary determinations for Wetlands A through C and Wetland F. The site investigation in June 2018 identified and delineated six wetlands on the subject property (Wetlands A through F). Additionally, one Type F stream (Hayho Creek) was identified and delineated along the western boundary of the northern parcel (Snohomish County Tax Parcel # 31052800400100) and two artificially excavated agricultural ditches were observed on the subject property. No other potentially-regulated wetlands, fish and wildlife habitat, streams, or priority species were identified adjacent to the subject property.

### 5.1 Groundwater Monitoring

As the site has been historically disturbed and altered, wetland determinations based on vegetation and soils (two of the three required wetland criteria) is problematic across much of the subject property. As such, wetland determinations across much of the subject property focused on the presence or absence of wetland hydrology using monitoring wells to evaluate groundwater. Near-surface water levels were measured every six to eight days at each monitoring well over a fourteen-week period starting on March 6 and ending on June 5, 2018 and compared with local precipitation data during the same period. The wettest months during the monitoring period were March and April (Table 2).

**Table 2. Monthly Precipitation Summary.**

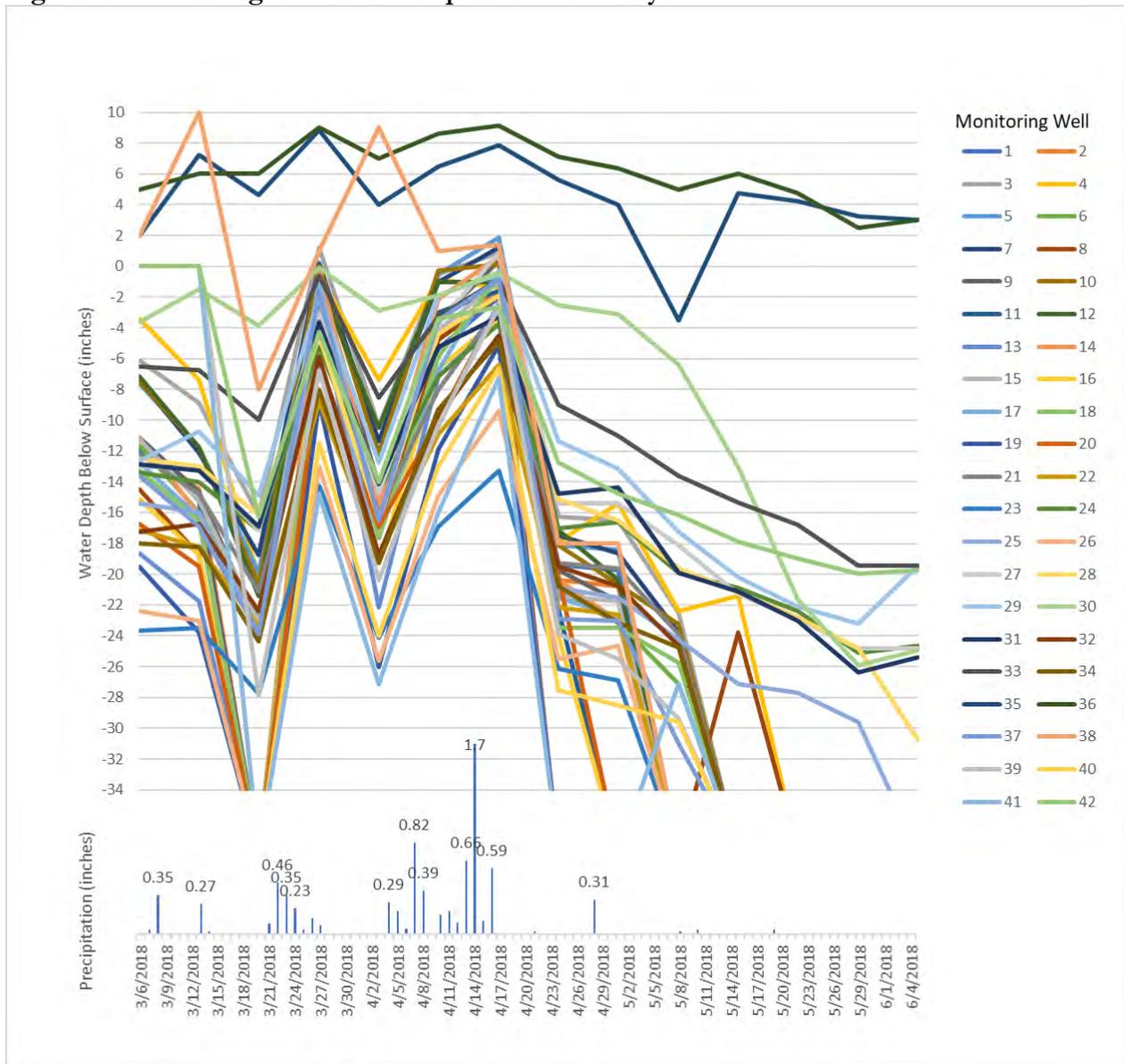
| Month             | Total Monthly Precipitation <sup>1</sup> | Normal Precipitation | Percent Normal |
|-------------------|--|----------------------|----------------|
| March             | 2.44                                     | 3.72                 | 65.59          |
| April             | 5.69                                     | 2.71                 | 209.96         |
| May               | 0.12                                     | 1.94                 | 6.18           |
| June <sup>2</sup> | 0.01                                     | 0.32                 | 3.12           |

Notes:

1. Precipitation volume in inches. Data obtained from the NOAA (<http://w2.weather.gov/climate/xmacis.php?wfo=sew>) for SeaTac International Airport.
2. June precipitation is only totaled up to the end of the monitoring period (June 5).

Precipitation levels during the monitoring period are shown below the monitoring well data (Figure 3) to demonstrate the rise and drop of near-surface water levels. Of note is that a measurement of zero on the Y-axis (Water Depth Below Surface) correlates to the ground surface, and anything above zero indicates the depth of ponded, or standing, water above ground.

**Figure 3. Monitoring Well and Precipitation Summary.**



The water levels throughout the monitoring period were highly variable and showed a strong relation to precipitation events: rapid changes in water elevation after and between each precipitation event indicated soils that drain water rapidly following a period of precipitation. The highest water table elevations during the monitoring period occurred during March and April; many monitoring wells showed water table elevations that rose to be at or above 12 inches following precipitation events in these months. However, of these monitoring well locations with high water tables following precipitation events, several had water table elevations that dropped below 12 inches during periods

with low or no precipitation. The following monitoring locations were observed to have water table elevations at or above 12 inches for at least a continuous 14-day period during the monitoring period: MP-3, MP-4, MP-7, MP-12, MP-30, MP-33, MP-35, MP-36, and MP-38.

## 5.2 Wetlands

Highly disturbed conditions for soils and vegetation were identified across much of the subject property due to agricultural use of the site. Following current wetland delineation methodology for highly disturbed or problematic sites, groundwater monitoring data was used to determine wetland hydrology and inform the wetland delineations in locations where disturbed soils and vegetation were present. A map depicting the location and sizes of each wetland is presented in Appendix C. Data forms are provided in Appendix E, wetland rating forms are provided in Appendix F, and wetland rating maps are provided in Appendix G. Table 3 below summarizes the wetlands identified during the site investigation.

**Table 3. Wetland Summary**

| Wetland  | Predominant Wetland Classification / Rating |                  |                    |                                 | Wetland Size Onsite (SF) | Standard Buffer Width (feet) <sup>5</sup> |
|----------|---|------------------|--------------------|---------------------------------|--------------------------|---|
|          | Cowardin <sup>1</sup>                       | HGM <sup>2</sup> | WSDOE <sup>3</sup> | City of Marysville <sup>4</sup> |                          |   |
| <b>A</b> | PEMAB                                       | Depressional     | IV                 | IV                              | 87,149 SF                | 35  |
| <b>B</b> | PEMAB                                       | Depressional     | IV                 | IV                              | 18,005 SF                | 35  |
| <b>C</b> | PFO/EMBC                                    | Depressional     | III                | III                             | 56,433 SF                | 75  |
| <b>D</b> | PEMB  | Depressional     | IV                 | IV                              | 5,347 SF                 | 35  |
| <b>E</b> | PEMAB                                       | Depressional     | IV                 | IV                              | 7,049 SF                 | 35  |
| <b>F</b> | PFO/SS/EM BC                                | Depressional     | II                 | II                              | 645,855 SF               | 100                                       |

Notes:

1. Cowardin et al. (1979), Federal Geographic Data Committee (2013), or NWI Class based on vegetation: PFO = Palustrine Forested, PSS = Palustrine Scrub Shrub, PEM = Palustrine Emergent; Modifiers for Water Regime: A = Temporarily Flooded, B = Seasonally Saturated, C = Seasonally Flooded.
2. Brinson, M. M. (1993).
3. Current WSDOE rating (Hruby, 2014).
4. MMC 22E.010.060.1 wetland classification. Mount Vernon rating according to Washington State Wetland Rating System for Western Washington (Hruby, 2014).
5. MMC 22E.010.100.4 standard buffer widths.

### Wetland A

Wetland A is approximately 87,149 square feet (2.0 acres) in size and is located along the eastern boundary of the subject property's southern parcel. Hydrology for Wetland A is provided by seasonally-high water table, direct precipitation, and surface runoff from adjacent uplands. Wetland vegetation is dominated by common velvetgrass, toad rush (*Juncus bufonius*), spotted lady's thumb (*Persicaria maculosa*), fringed willowherb (*Epilobium ciliatum*), and marsh cudweed (*Gnaphalium uliginosum*). Wetland A is a Palustrine Emergent, Temporarily Flooded, Seasonally Saturated (PEMAB) wetland. Per MMC 22E.010.060.1, Wetland A is considered a Category IV depressional wetland. Table 4 provides a summary of Wetland A.

## **Wetland B**

Wetland B is approximately 18,005 square feet (0.41 acre) in size and is located along the eastern boundary of the subject property's southern parcel. Hydrology for Wetland B is provided by a seasonally-high water table, direct precipitation, and surface runoff from adjacent uplands. Wetland vegetation is dominated by perennial ryegrass (*Lolium perenne*), marsh cudweed, and slough sedge (*Carex obnupta*). Wetland B is a Palustrine Emergent, Temporarily Flooded, Seasonally Saturated (PEMAB) wetland. Per MMC 22E.010.060.1, Wetland B is a Category IV depressional wetland. Table 5 summarizes Wetland B.

## **Wetland C**

Wetland C is approximately 56,433 square feet (1.3 acres) in size and is located southwest corner of the subject property's southern parcel. Hydrology for Wetland C is provided by a seasonally-high water table, direct precipitation, and surface runoff from adjacent uplands. Wetland vegetation is dominated by paper birch (*Betula papyrifera*), soft rush (*Juncus effusus*), common velvetgrass, and creeping buttercup (*Ranunculus repens*). Wetland C is a Palustrine Forested/Emergent, Seasonally Saturated, Seasonally Flooded wetland (PFO/EMBC). Per MMC 22E.010.060.1, Wetland C is a Category III depressional wetland. Table 6 summarizes Wetland C.

## **Wetland D**

Wetland D is approximately 5,347 square feet (0.12 acre) in size and is located on western portion of the subject property's southern parcel. Hydrology for Wetland D is provided by a seasonally-high water table, direct precipitation, and surface runoff from adjacent uplands. Wetland vegetation is dominated by paper birch, soft rush (*Juncus effusus*), common velvetgrass, and creeping buttercup. Wetland D is a Palustrine Emergent, Seasonally Saturated wetland (PEMB). Per MMC 22E.010.060.1, Wetland D is a Category IV depressional wetland. Table 7 summarizes Wetland D.

## **Wetland E**

Wetland E is approximately 7,049 square feet (0.16 acre) in size and is located on the central portion of the subject property. Hydrology for Wetland E is provided by a seasonally-high water table, direct precipitation, and surface runoff from adjacent uplands. Wetland vegetation is dominated by common velvetgrass, toad rush, and fringed willowherb. Wetland E is a Palustrine Emergent, Temporarily Flooded, Seasonally Saturated wetland (PEMAB). Per MMC 22E.010.060.1, Wetland E is a Category IV depressional wetland. Table 8 summarizes Wetland E.

## **Wetland F**

Wetland F is approximately 645,855 square feet (14.83 acres) in size and is located on the northwest portion of the subject property's northern parcel; the wetland extends offsite to the northwest and west. Hydrology for Wetland F is provided by a seasonally-high water table, direct precipitation, surface runoff from adjacent uplands, and seasonal flooding from Hayho Creek. Wetland vegetation is dominated by black cottonwood (*Populus balsamifera*), Pacific willow (*Salix lasiandra*), Schouler's willow (*Salix scouleriana*), Hooker's willow (*Salix hookeriana*), Scoulers fumewort (*Cordalis scouleri*), hardhack (*Spiraea douglasii*), common velvetgrass, soft rush, Idaho fescue (*Festuca idahoensis*), and bird's-foot trefoil (*Lotus corniculatus*). Wetland F is a Palustrine Forested/Scrub-Shrub/Emergent, Seasonally Saturated, Seasonally Flooded wetland (PFO/SS/EMBC). Per MMC 22E.010.060.1, Wetland F is a Category II depressional wetland. Table 9 summarizes Wetland F.

**Table 4. Wetland A Summary.**

| <b>WETLAND A – INFORMATION SUMMARY</b>  |  |                          |
|---|--|--------------------------|
| <b>Location:</b>  | Wetland A is located along the eastern boundary of the subject property’s southern parcel.   |                          |
|  | <b>Local Jurisdiction</b>  | City of Marysville       |
|   | <b>WRIA</b>  | 7 – Snohomish            |
|   | <b>WSDOE Rating (Hruby, 2014)</b>  | IV                       |
|   | <b>Marysville Rating</b>   | IV                       |
|   | <b>Marysville Buffer Width</b>   | 35 feet                  |
|   | <b>Wetland Size</b>  | 87,149 SF                |
|   | <b>Cowardin Classification</b>   | PEMAB                    |
|   | <b>HGM Classification</b>  | Depressional             |
|   | <b>Wetland Data Sheet(s)</b>   | MP/DP-3, DP-3-2, MP/DP-4 |
|   | <b>Upland Data Sheet (s)</b>   | MP/DP-5, DP-43           |
|   | <b>Boundary Flag color</b>   | Orange                   |
| <b>Dominant Vegetation</b>  | Wetland vegetation is dominated by common velvetgrass ( <i>Holcus lanatus</i> ), toad rush ( <i>Juncus bufonius</i> ), spotted lady’s thumb ( <i>Persicaria maculosa</i> ), fringed willowherb ( <i>Epilobium ciliatum</i> ), and marsh cudweed ( <i>Gnaphalium uliginosum</i> ).  |                          |
| <b>Soils</b>  | Hydric soil indicator F6 (Redox Dark Surface) was observed at DP-3   |                          |
| <b>Hydrology</b>  | Hydrology is likely provided by seasonally-high water table, direct precipitation, and surface runoff from adjacent uplands.   |                          |
| <b>Rationale for Delineation</b>  | Wetland boundaries were determined by a transition to wetland hydrology and hydric soils. Wetland hydrology was determined by groundwater monitoring study. Wetland hydrology was observed at monitoring locations MP-3 and MP-4, and non-wetland hydrology was observed at monitoring location MP-5.  |                          |
| <b>Rationale for Local Rating</b>   | Local rating is based upon WSDOE’s current rating system and MMC 22E.010.060.1   |                          |
| <b>Wetland Functions Summary</b>  |  |                          |
| <b>Water Quality</b>  | Wetland A can only provide minimal pollutant filtration as persistent, ungrazed plants cover less than 1/10 of the wetland and any seasonal ponded area is less than ¼ of the wetland area. The area immediately surrounding Wetland A does generate pollutants, providing some potential for water quality improvement in the wetland. The value of any water quality improvement functions within Wetland A is increased as the wetland is located in a sub-basin where water quality is an issue. Wetland A scores 6 out of 9 points for water quality functions. |                          |
| <b>Hydrologic</b>   | Wetland A can provide minimal water storage due to the lack of a constricted surface outlet. Wetland A has moderate potential to provide hydrologic functions the immediate area surrounding does not generate excessive runoff even though at least 25 percent of the contributing basin is covered in intensive human land uses. The ability of the wetland to provide water storage is valuable as the unit is in a sub-basin with flooding problems. Wetland A scores 5 out of 9 points for hydrologic functions.  |                          |

|                         |  |
|-------------------------|--|
| <b>Habitat</b>          | Wetland A likely provides forage and cover for small terrestrial mammals and birds. Wetland A is dominated by native species and non-native, invasive species cover less than 25 percent of the wetland. However, the diversity of niches within the wetland is limited by the presence of only one Cowardin class. The value of Wetland A habitat is minimal as it is not located within 100 m of any WDFW Priority Habitats and does not provide habitat for priority species. Wetland A scores 4 out of 9 points for habitat functions. |
| <b>Buffer Condition</b> | The Wetland A onsite buffer consists of fallow agricultural land. The buffer is interrupted by 51st Avenue Northwest to the east.  |

**Table 5. Wetland B Summary.**

| <b>WETLAND B – INFORMATION SUMMARY</b>  |  |                    |
|---|--|--------------------|
| <b>Location:</b>  | Wetland B is located along the eastern boundary of the subject property’s southern parcel.   |                    |
|  | <b>Local Jurisdiction</b>  | City of Marysville |
|   | <b>WRIA</b>  | 7 – Snohomish      |
|   | <b>WSDOE Rating (Hruby, 2014)</b>  | IV                 |
|   | <b>Marysville Rating</b>   | IV                 |
|   | <b>Marysville Buffer Width</b>   | 35 feet            |
|   | <b>Wetland Size</b>  | 18,005 SF          |
|   | <b>Cowardin Classification</b>   | PEMAB              |
|   | <b>HGM Classification</b>  | Depressional       |
|   | <b>Wetland Data Sheet(s)</b>   | MP/DP-7, DP-45     |
|   | <b>Upland Data Sheet (s)</b>   | MP/DP -6, DP-44    |
|   | <b>Boundary Flag color</b>   | Orange             |
| <b>Dominant Vegetation</b>  | Wetland vegetation is dominated by perennial ryegrass ( <i>Lolium perenne</i> ), marsh cudweed, and slough sedge ( <i>Carex obnupta</i> ).   |                    |
| <b>Soils</b>  | Hydric soil indicator F3 (Depleted Matrix) was observed at MP/DP-7, and hydric soil indicator F6 (Redox Dark Surface) was observed at DP-45.   |                    |
| <b>Hydrology</b>  | Hydrology is likely provided by a seasonally-high water table, direct precipitation, and surface runoff from adjacent uplands.   |                    |
| <b>Rationale for Delineation</b>  | Wetland boundaries were determined by a transition to wetland hydrology and hydric soils. Wetland hydrology was determined by groundwater monitoring study. Wetland hydrology was observed at monitoring locations MP-7, and non-wetland hydrology was observed at monitoring location MP-6.   |                    |
| <b>Rationale for Local Rating</b>   | Local rating is based upon WSDOE’s current rating system and MMC 22E.010.060.1   |                    |
| <b>Wetland Functions Summary</b>  |  |                    |
| <b>Water Quality</b>  | Wetland B can provide some pollutant filtration as persistent, ungrazed vegetation covers less than half the area. The land immediately surrounding Wetland B is in agricultural use and generates pollutants for wetland filtration. This ability to provide pollutant filtration is valuable as the unit is in a sub-basin where water quality is an issue. Wetland B scores 6 out of 9 points for water quality functions.  |                    |
| <b>Hydrologic</b>   | Wetland B can provide minimal water storage due to the lack of a constricted surface outlet. Wetland B has moderate potential to provide hydrologic functions the immediate area surrounding does not generate excessive runoff even though at least 25 percent of the contributing basin is covered in intensive human land uses. The ability of the wetland to provide water storage is valuable as the unit is in a sub-basin with flooding problems. Wetland B scores 5 out of 9 points for hydrologic functions.                      |                    |
| <b>Habitat</b>  | Wetland B likely provides forage and cover for small terrestrial mammals and birds. Wetland B is dominated by native species and non-native, invasive species cover less than 25 percent of the wetland. However, the diversity of niches within the wetland is limited by the presence of only one Cowardin class. The value of Wetland B habitat is minimal as it is not located within 100 m of any WDFW Priority Habitats and does not provide habitat for priority species. Wetland B scores 4 out of 9 points for habitat functions. |                    |
| <b>Buffer Condition</b>   | The Wetland B onsite buffer consists of fallow agricultural land. The buffer is interrupted by 51st Avenue Northwest to the east.  |                    |

Table 6. Wetland C Summary.

| <b>WETLAND C – INFORMATION SUMMARY</b>  |   |                    |
|---|---|--------------------|
| <b>Location:</b>  | Wetland C is located southwest corner of the subject property’s southern parcel.  |                    |
|  | <b>Local Jurisdiction</b>   | City of Marysville |
|   | <b>WRIA</b>   | 7 – Snohomish      |
|   | <b>WSDOE Rating (Hruby, 2014)</b>   | III                |
|   | <b>Marysville Rating</b>  | III                |
|   | <b>Marysville Buffer Width</b>  | 75 feet            |
|   | <b>Wetland Size</b>   | 56,433 SF          |
|   | <b>Cowardin Classification</b>  | PFO/EMBC           |
|   | <b>HGM Classification</b>   | Depressional       |
|   | <b>Wetland Data Sheet(s)</b>  | DP-47 and MP/DP-38 |
|   | <b>Upland Data Sheet (s)</b>  | DP-46 and DP-48    |
|   | <b>Boundary Flag color</b>  | Orange             |
| <b>Dominant Vegetation</b>  | Wetland vegetation is dominated by black cottonwood, red alder ( <i>Alnus rubra</i> ), quaking aspen ( <i>Populus tremuloides</i> ), Pacific crabapple ( <i>Malus fusca</i> ), twinberry honeysuckle ( <i>Lonicera involucrata</i> ), lady fern ( <i>Athyrium cyclosorum</i> ), creeping buttercup ( <i>Ranunculus repens</i> ), and Himalyan blackberry ( <i>Rubus armeniacus</i> ).   |                    |
| <b>Soils</b>  | Hydric soil indicators A11 (Depleted Below Dark Surface) and F6 (Redox Dark Surface) were observed at DP-47.  |                    |
| <b>Hydrology</b>  | Hydrology is likely provided by a seasonally-high water table, direct precipitation, and surface runoff from adjacent uplands.  |                    |
| <b>Rationale for Delineation</b>  | Wetland boundaries were determined by a transition to wetland hydrology and hydric soils. Wetland hydrology was determined by groundwater monitoring study. Wetland hydrology was observed at monitoring locations MP-38, and non-wetland hydrology was observed at monitoring location MP-12.  |                    |
| <b>Rationale for Local Rating</b>   | Local rating is based upon WSDOE’s current rating system and MMC 22E.010.060.1  |                    |
| <b>Wetland Functions Summary</b>  |   |                    |
| <b>Water Quality</b>  | Wetland C can provide pollutant filtration due to the presence of persistent, ungrazed plants that cover greater than 50 percent of the wetland and seasonal ponding that covers more than 25 percent of the wetland. This ability to provide pollutant filtration is valuable as the unit is in a sub-basin where water quality is an issue. However, Wetland C has a low potential to provide water quality functions as the majority of the land immediately surrounding the wetland is tree covered and does not generate pollutants. Wetland C scores 6 out of 9 points for water quality functions. |                    |
| <b>Hydrologic</b>   | Wetland C can provide minimal water storage due to the lack of a constricted surface outlet. Wetland C has moderate potential to provide hydrologic functions the immediate area surrounding does not generate excessive runoff even though at least 25 percent of the contributing basin is covered in intensive human land uses. The ability of the wetland   |                    |

|                         |   |
|-------------------------|---|
|                         | to provide water storage is valuable as the unit is in a sub-basin with flooding problems. Wetland C scores 5 out of 9 points for hydrologic functions.   |
| <b>Habitat</b>          | Wetland C likely provides forage and cover for small terrestrial mammals and birds. The wetland contains two Cowardin classes with low interspersions and special habitat features. Wetland C scores 4 out of 9 points for habitat functions. |
| <b>Buffer Condition</b> | The buffer surrounding Wetland C consists of fallow agricultural land to the east and forest dominated by black cottonwood and red alder.   |

**Table 7. Wetland D Summary.**

| <b>WETLAND D – INFORMATION SUMMARY</b>  |   |                    |
|---|---|--------------------|
| <b>Location:</b>  | Wetland D is located on western portion of the subject property’s southern parcel.  |                    |
|  | <b>Local Jurisdiction</b>   | City of Marysville |
|   | <b>WRIA</b>   | 7 – Snohomish      |
|   | <b>WSDOE Rating (Hruby, 2014)</b>   | IV                 |
|   | <b>Marysville Rating</b>  | IV                 |
|   | <b>Marysville Buffer Width</b>  | 35 feet            |
|   | <b>Wetland Size</b>   | 5,347 SF           |
|   | <b>Cowardin Classification</b>  | PEMB               |
|   | <b>HGM Classification</b>   | Slope              |
|   | <b>Wetland Data Sheet(s)</b>  | DP-49              |
|   | <b>Upland Data Sheet (s)</b>  | DP-50              |
| <b>Boundary Flag color</b>  | Orange  |                    |
| <b>Dominant Vegetation</b>  | Wetland vegetation is dominated by paper birch ( <i>Betula papyrifera</i> ), soft rush ( <i>Juncus effusus</i> ), common velvetgrass ( <i>Holcus lanatus</i> ), and creeping buttercup ( <i>Ranunculus repens</i> ).  |                    |
| <b>Soils</b>  | Hydric soil indicators A11 (Depleted Below Dark Surface) and F3 (Depleted Matrix) were observed at DP-49.   |                    |
| <b>Hydrology</b>  | Hydrology is likely provided by direct precipitation, surface sheet flow, and a seasonally high groundwater table.  |                    |
| <b>Rationale for Delineation</b>  | Wetland boundaries were determined by a topographic break and transition to wetland hydrology and hydric soils.   |                    |
| <b>Rationale for Local Rating</b>   | Local rating is based upon WSDOE’s current rating system and MMC 22E.010.060.1  |                    |
| <b>Wetland Functions Summary</b>  |   |                    |
| <b>Water Quality</b>  | Wetland D can provide some pollutant filtration as persistent, ungrazed plants cover greater than 50 percent of the wetland. This ability to provide pollutant filtration is valuable as the unit is in a sub-basin where water quality is an issue. However, Wetland D has a low potential to provide water quality functions as the majority of the land immediately surrounding the wetland is tree covered and does not generate pollutants. Wetland D scores 6 out of 9 points for water quality functions.      |                    |
| <b>Hydrologic</b>   | Wetland D can provide minimal water storage due to the lack of a constricted surface outlet. Wetland D has moderate potential to provide hydrologic functions the immediate area surrounding does not generate excessive runoff even though at least 25 percent of the contributing basin is covered in intensive human land uses. The ability of the wetland to provide water storage is valuable as the unit is in a sub-basin with flooding problems. Wetland D scores 5 out of 9 points for hydrologic functions. |                    |
| <b>Habitat</b>  | Wetland D likely provides forage and cover for small terrestrial mammals and birds. However, the diversity of niches within the wetland is limited by the presence of only one Cowardin class. The value of Wetland D habitat is increased due to WDFW priority snags/logs located within 100 m of the wetland. Wetland D scores 4 out of 9 points for habitat functions.   |                    |
| <b>Buffer Condition</b>   | The buffer surrounding Wetland D consists of fallow agricultural land to the east and forest dominated by black cottonwood, red alder, and quaking aspen to the west.   |                    |

**Table 8. Wetland E Summary.**

| <b>WETLAND E – INFORMATION SUMMARY</b>  |   |                    |
|---|---|--------------------|
| <b>Location:</b>  | Wetland E is located on the central portion of the subject property.  |                    |
|  | <b>Local Jurisdiction</b>   | City of Marysville |
|   | <b>WRIA</b>   | 7 – Snohomish      |
|   | <b>WSDOE Rating (Hruby, 2014)</b>   | IV                 |
|   | <b>Marysville Rating</b>  | IV                 |
|   | <b>Marysville Buffer Width</b>  | 75 feet            |
|   | <b>Wetland Size</b>   | 7,049 SF           |
|   | <b>Cowardin Classification</b>  | PEMAB              |
|   | <b>HGM Classification</b>   | Depressional       |
|   | <b>Wetland Data Sheet(s)</b>  | DP-51              |
|   | <b>Upland Data Sheet (s)</b>  | DP-52              |
| <b>Boundary Flag color</b>  | Orange  |                    |
| <b>Dominant Vegetation</b>  | Wetland vegetation is dominated by common velvetgrass, toad rush, and fringed willowherb.   |                    |
| <b>Soils</b>  | Hydric soil indicators A11 (Depleted Below Dark Surface), F3 (Depleted Matrix), and F6 (Redox Dark Surface) were observed at DP-51.   |                    |
| <b>Hydrology</b>  | Hydrology is likely provided by direct precipitation, surface sheet flow, and a seasonally high groundwater table.  |                    |
| <b>Rationale for Delineation</b>  | Wetland boundaries were determined by a transition to hydric soils.   |                    |
| <b>Rationale for Local Rating</b>   | Local rating is based upon WSDOE’s current rating system and MMC 22E.010.060.1  |                    |
| <b>Wetland Functions Summary</b>  |   |                    |
| <b>Water Quality</b>  | Wetland E can provide pollutant filtration due to the presence of persistent, ungrazed plants that cover greater than 10 percent of the wetland and seasonal ponding over greater than 25 percent of the wetland. Wetland E has moderate potential to provide water quality functions as some of the area surrounding the wetland generates pollutants. This ability to provide pollutant filtration is valuable as the unit is in a sub-basin where water quality is an issue. Wetland E scores 6 out of 9 points for water quality functions. |                    |
| <b>Hydrologic</b>   | Wetland E can provide minimal water storage due to the lack of a constricted surface outlet. Wetland E has moderate potential to provide hydrologic functions the immediate area surrounding does not generate excessive runoff even though at least 25 percent of the contributing basin is covered in intensive human land uses. The ability of the wetland to provide water storage is valuable as the unit is in a sub-basin with flooding problems. Wetland E scores 5 out of 9 points for hydrologic functions.                           |                    |
| <b>Habitat</b>  | Wetland E likely provides forage and cover for small terrestrial mammals and birds. Wetland E is located near WDFW Priority Habitats that increase the habitat value of the wetland. However, the wetland lacks special habitat features and contains only one Cowardin class, limiting the niche diversity within the wetland. Wetland E scores 5 out of 9 points for habitat functions.   |                    |
| <b>Buffer Condition</b>   | The onsite buffer surrounding Wetland E consists of agricultural land.  |                    |

**Table 9. Wetland F Summary.**

| <b>WETLAND F – INFORMATION SUMMARY</b>  |   |  |
|---|---|--|
| <b>Location:</b>  | Wetland F is located on the northwest portion of the subject property’s northern parcel; the wetland extends offsite to the northwest and west.   |  |
|  | <b>Local Jurisdiction</b>   | City of Marysville                         |
|   | <b>WRIA</b>   | 7 – Snohomish                              |
|   | <b>WSDOE Rating (Hruby, 2014)</b>   | II   |
|   | <b>Marysville Rating</b>  | II   |
|   | <b>Marysville Buffer Width</b>  | 100 feet                                   |
|   | <b>Wetland Size</b>   | 645,855 SF                                 |
|   | <b>Cowardin Classification</b>  | PFO/SS/EMBC                                |
|   | <b>HGM Classification</b>   | Depressional                               |
|   | <b>Wetland Data Sheet(s)</b>  | MP/DP-30 and MP/DP-33                      |
|   | <b>Upland Data Sheet (s)</b>  | MP/DP-29, MP/DP-31, MP/DP-32, and MP/DP-34 |
|   | <b>Boundary Flag color</b>  | Orange                                     |
| <b>Dominant Vegetation</b>  | Wetland vegetation is dominated by black cottonwood ( <i>Populus balsamifera</i> ), Pacific willow ( <i>Salix lasiandra</i> ), Schouler’s willow ( <i>Salix scouleriana</i> ), Hooker’s willow ( <i>Salix hookeriana</i> ), Scoulers fumewort ( <i>Cordalis scouleri</i> ), hardhack ( <i>Spiraea douglasii</i> ), common velvetgrass, soft rush, Idaho fescue ( <i>Festuca idahoensis</i> ), and bird’s-foot trefoil ( <i>Lotus corniculatus</i> ).  |  |
| <b>Soils</b>  | Hydric soil indicator F6 (Redox Dark Surface) was observed at MP/DP-30 and MP/DP-33.  |  |
| <b>Hydrology</b>  | Hydrology is likely provided by direct precipitation, surface sheet flow, and a seasonally high groundwater table.  |  |
| <b>Rationale for Delineation</b>  | Wetland boundaries were determined by a transition to wetland hydrology and hydric soils. Wetland hydrology was determined by groundwater monitoring study. Wetland hydrology was observed at monitoring locations MP-30, MP-33, MP-35, and MP-36, and non-wetland hydrology was observed at monitoring location MP-29, MP-31, MP-32, and MP-34.  |  |
| <b>Rationale for Local Rating</b>   | Local rating is based upon WSDOE’s current rating system and MMC 22E.010.060.1  |  |
| <b>Wetland Functions Summary</b>  |   |  |
| <b>Water Quality</b>  | Wetland F can provide pollutant filtration due to the presence of persistent, ungrazed plants that cover greater than 95 percent of the wetland and an intermittently flowing outlet. This ability to provide pollutant filtration is valuable as the unit is in a sub-basin where water quality is an issue. Wetland F has moderate potential to provide water quality functions as some of the area surrounding the wetland generates pollutants. Wetland F scores 7 out of 9 points for water quality functions. |  |
| <b>Hydrologic</b>   | Wetland F can provide some water storage due to an intermittently flowing outlet and marks of ponding at least 6 inches above the bottom of the outlet. Wetland F has moderate potential to provide hydrologic functions the immediate area surrounding does not generate excessive runoff even though at least 25 percent of the contributing basin is covered in intensive human land uses. The ability of the wetland to provide water storage   |  |

|                         |   |
|-------------------------|---|
|                         | is valuable as the unit is in a sub-basin with flooding problems. Wetland F scores 6 out of 9 points for water quality functions.   |
| <b>Habitat</b>          | Wetland F likely provides forage and cover for small terrestrial mammals and birds. Wetland F contains three Cowardin classes that provide niche diversity and contains many special habitat features. Wetland F is located near WDFW Priority Habitats that increase the habitat value of the wetland. Wetland F scores 6 out of 9 points for habitat functions. |
| <b>Buffer Condition</b> | The onsite buffer surrounding Wetland F consists of agricultural land.  |

### 5.3 Hayho Creek

The site investigation identified an onsite stream (Hayho Creek) along the western boundary of the subject property. Hayho Creek appears to be artificially channelized through the subject property, and the onsite portion was observed to be dry during the follow-up site assessment in early August 2018. Hayho Creek originates approximately 925 feet north and slightly west of the subject property. The creek's origin point is adjacent to single-family residential and commercial developments. The creek continues to flow south from the subject property through a straight channel for approximately 1.56 miles before meandering to the southeast and joining with the Quilceda Creek Middle Fork. DNR classifies an onsite agricultural ditch as Type N (non-fish-bearing); WDFW Salmonscape identifies the presumed presence of Dolly Varden/bull trout and coho and the modeled presence of chinook salmon (*Onchorynchus tshawytscha*), pink salmon (*Onchorynchus gorbuscha*), and steelhead trout (*Onchorynchus mykiss*) in Hayho Creek. Due to the modeled presence of salmonids by WDFW and lack of downstream barriers to fish passage, Hayho Creek is likely a Type F (fish-bearing) stream per MMC 22E.010.210.1.b. Per MMC 22E.010.220.1.a, Type F streams are subject to standard 150-foot buffers. A summary of Hayho Creek is provided in Table 10 below.

**Table 10. Drainage Summary – Hayho Creek.**

| <b>DRAINAGE INFORMATION SUMMARY</b>   |   |                           |
|---|---|---------------------------|
|  | <b>Feature Name</b>   | Hayho Creek               |
|   | <b>WRIA</b>   | 7 – Snohomish             |
|   | <b>WA Stream Catalog #</b>  | 1221633481096             |
|   | <b>Local Jurisdiction</b>   | City of Marysville        |
|   | <b>DNR Stream Type</b>  | Type N – Non-Fish Bearing |
|   | <b>Local Stream Rating</b>  | Type F                    |
|   | <b>Buffer Width</b>   | 150 feet                  |
|   | <b>Documented Fish Use</b>  | None                      |
| <b>Location of Feature</b>  | Hayho Creek is located near the western boundary of the subject property’s northern tax parcel.   |                           |
| <b>Connectivity (where water flows from/to)</b>                                   | Hayho Creek originates approximately 925 feet north and slightly west of the subject property. The creek’s origin point is adjacent to single-family residential and commercial developments. The creek continues to flow south from the subject property through a straight channel for approximately 1.56 miles before meandering to the southeast and joining with the Quilceda Creek Middle Fork. |                           |
| <b>Riparian/Buffer Condition</b>  | The onsite buffer area consists of a narrow band of trees and agricultural land.  |                           |

## 5.4 Non-Regulated Drainages

Two intentionally, artificially excavated, linear, non-wetland, agricultural drainage ditches (Ditch Z and Ditch Y) were identified on the subject property as illustrated on site plan in Attachment C. Small drainage ditches are located on the western side of the south parcel, draining into Wetland C. An offsite roadside ditch (51<sup>st</sup> Avenue Northeast West Ditch) was observed along the west side of 51<sup>st</sup> Avenue Northeast. Ditch Z and Ditch Y are linear excavations draining agricultural fields. The two drainage ditches originate on the subject property and drain to Hayho Creek. DNR maps the northern ditch as a Type N waterbody, while WDFW Salmonscape includes modeled (not documented) salmonid presence within the north ditch. However, none of the observed drainage ditches exhibit natural stream characteristics (bed and bank) and do not meet the definition of a typed waterbody according to WAC 222-16-030. As such, they are likely considered non-regulated per MMC 22E.010.210.1.

# Chapter 6. Regulatory Considerations

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## 6.1 Local Critical Areas Requirements

### 6.1.1 Critical Area Buffers

MMC 22E.010.060.1 has adopted the 2014 wetland rating system. Category II wetlands provide moderately high levels of functions and score between 20 and 22 points on the *Washington State Wetland Rating System for Western Washington*. Category III wetlands generally provide moderate levels of functions and score less than 20 points on the revised wetland rating system. Category IV wetlands generally provide low levels of function and score less than 16 points on the revised wetland rating system (Hruby, 2014). The onsite Wetlands A, B, D, and E are Category IV wetlands. The onsite Wetland C is a Category III wetland, and the onsite Wetland F is a Category II wetland. Under MMC 22E.010.100.4 the standard buffers for Category II wetlands are 100 feet, the standard buffers for Category III wetlands are 75 feet, and the standard buffers for Category IV wetlands are 35 feet. Hayho Creek is a Type F stream with a 150-foot buffer under MMC 22E.010.220.1.a.

## 6.2 State and Federal Considerations

### 6.2.1 State Requirements

All identified onsite wetlands and Hayho Creek are likely to be regulated as waters of the state of Washington under the RCW 90.48 and WAC 173-201A. Any direct impacts to the wetlands or stream would be regulated by WSDOE under RCW 90.48 and require the seeking of an Administrative Order (AO) from WSDOE. The onsite ditches are artificially excavated features that are not likely to be regulated as wetlands. Due to surface water connections between the two onsite ditches (Ditches Z and Y) and a natural tributary (Hayho Creek), these ditches may be considered waters of the state. The drainage ditches on the western portion of the southern parcel flows into Wetland C and does not connect to any downgradient natural tributaries. This drainage ditches is not likely considered waters of the state.

### 6.2.2 Federal Requirements

The Federal Register published “The Navigable Waters Protection Rule: Definition of “Waters of the United States” on April 21, 2020. The Navigable Waters Protection Rule was the second step in reviewing and revising the definition of WOTUS as intended by the Executive Order “Restoring the Rule of Law, Federalism, and Economic Growth by Reviewing the ‘Waters of the United States Rule.’” The Navigable Waters Protection Rule became effective June 22, 2020 and was in place during the time of the Approved Jurisdictional Determination..

The Navigable Waters Protection Rule effectively replaced the “Definition of Waters of the United States – Recodification of Pre-Existing Rules” rule published on October 22, 2019 (repealing the Clean Water Rule) and the 2008 joint guidance memorandum from USACE and EPA. The following describes potential regulatory classifications for the onsite stream, wetlands, and ditches under the Navigable Waters Protection Rule.

Under the final Navigable Waters Protection Rule, the agencies interpret the term WOTUS to encompass: 1) the territorial seas and traditional navigable waters; 2) perennial and intermittent

tributaries that contribute surface water flow to such waters; 3) certain lakes, ponds, and impoundments of jurisdictional waters; and 4) wetlands adjacent to other jurisdictional waters.

Under the final Navigable Waters Protection Rule, adjacent wetlands are subject to a different jurisdictional test than tributaries, lakes, ponds, and impoundments of jurisdictional wetlands. “Adjacent wetlands” are wetlands that: 1) abut a territorial seas or traditional navigable water, tributary, or a lake, pond, or impoundment of jurisdictional water; 2) are inundated from flooding from a territorial sea or traditional navigable water, or tributary, or from another jurisdictional lake, pond, or impoundment in a typical year; 3) are physically separated from a territorial seas, traditional navigable water, tributary, or a lake, pond, or impoundment of jurisdictional water only by a berm, bank, dune, or similar natural feature; or 4) are physically separated from a territorial sea or traditional navigable water, a tributary, or a lake, pond or impoundment of a jurisdictional water only by an artificial dike, barrier, or similar artificial structure so long as that structure allows for a direct hydrological surface connection to the territorial seas or traditional navigable water, tributary, or lake, pond, or impoundment of a jurisdictional water in a typical year.

The Navigable Waters Protection Rule specifies that WOTUS do not include: a) groundwater, including groundwater drained through subsurface drainage systems; b) ephemeral features that flow only in direct response to precipitation, including ephemeral streams, swales, gullies, rills, and pools; c) diffuse stormwater runoff and directional sheet flow over upland; d) ditches that are not traditional navigable waters, tributaries, or that are not constructed in adjacent wetlands, subject to certain limitations; e) prior converted cropland; f) artificially irrigated areas that would revert to upland if artificial irrigation ceases; g) artificial lakes and ponds that are not jurisdictional impoundments and that are constructed or excavated in upland or non-jurisdictional waters; h) water-filled depressions constructed or excavated in upland or in non-jurisdictional waters incidental to mining or construction activity, and pits excavated in upland or in non-jurisdictional waters for the purpose of obtaining fill, sand, or gravel; i) stormwater control features constructed or excavated in upland or in non-jurisdictional waters to convey, treat, infiltrate, or store stormwater runoff; j) groundwater recharge, water reuse, and wastewater recycling structures constructed or excavated in upland or in non-jurisdictional waters; and k) waste treatment systems.

Hayho Creek is not regulated as a WOTUS, as the creek is an artificial channel that did not relocate an existing tributary and was not constructed within a wetland (Appendix D). The onsite agricultural ditches and the offsite 51<sup>st</sup> Avenue West Ditch are artificially excavated ditches constructed for agricultural or roadside drainage purposes; these ditches are not constructed within tributaries, nor do they relocate a tributary. These ditches are not regulated as WOTUS (Appendix D). The remaining onsite wetlands (Wetlands A through E) are not regulated as WOTUS because they are not abutting a potentially regulated tributary and do not contribute surface water to a potentially regulated tributary. Wetlands A and B are separated from the 51<sup>st</sup> Avenue West Ditch by a berm that prevents a direct hydrologic surface connection between the wetlands and the ditch. In addition, Wetlands A and B are seasonally saturated, temporarily flooded depressional wetlands located near the 51<sup>st</sup> Avenue West Ditch near the eastern boundary of the south parcel. Wetland E is similarly separated from an adjacent onsite ditch by an upland berm that prevents a direct hydrologic surface connection to potentially jurisdictional waters. Wetlands C and D are a closed depression that lack an outlet and direct surface

water connection to potentially jurisdictional waters. Please refer to Appendix D for the *Approved Jurisdictional Determinations* from the USACE dated February 24, 2021 and July 13, 2021.

## Chapter 7. Closure

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The findings and conclusions documented in this report have been prepared for specific application to this project. They have been developed in a manner consistent with that level of care and skill normally exercised by members of the environmental science profession currently practicing under similar conditions in the area. Our work was also performed in accordance with the terms and conditions set forth in our proposal. The conclusions and recommendations presented in this report are professional opinions based on an interpretation of information currently available to us and are made within the operation scope, budget, and schedule of this project. No warranty, expressed or implied, is made. In addition, changes in government codes, regulations, or laws may occur. Due to such changes, our observations and conclusions applicable to this project may need to be revised wholly or in part.

Wetland and OHW status and boundaries identified by SVC are based on conditions present at the time of the site visit and considered preliminary until the estimated offsite wetland boundaries and flagged OHW boundaries are validated by the jurisdictional agencies. Validation of the wetland and OHW boundaries and jurisdictional status of such features by the regulatory agencies provides a certification, usually written, that the wetland and OHW determination and boundaries verified are the units that will be regulated by the agencies until a specific date or until the regulations are modified. Only the regulatory agencies can provide this certification.

As wetlands and aquatic areas are dynamic communities affected by both natural and human activities, changes in boundaries may be expected; therefore, delineations cannot remain valid for an indefinite period of time. Regulatory agencies typically recognize the validity of wetland and OHW delineations for a period of 5 years after completion of an assessment report. Development activities on a site five years after the completion of this assessment report may require reassessment of the wetland and OHW boundaries. In addition, changes in government codes, regulations, or laws may occur. Due to such changes, our observations and conclusions applicable to this site may need to be revised wholly or in part.

## Chapter 8. References

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# Appendix A — Methods and Tools

**Table A-1. Methods and tools used to prepare the report.**

| Parameter                | Method or Tool  | Website   | Reference   |
|--------------------------|---|---|---|
| Wetland Delineation      | USACE 1987 Wetland Delineation Manual   | <a href="http://el.erdc.usace.army.mil/elpubs/pdf/wlman87.pdf">http://el.erdc.usace.army.mil/elpubs/pdf/wlman87.pdf</a>   | <b>Environmental Laboratory.</b> 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1, US Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.  |
|                          | Regional Supplement to the Core of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0) | <a href="http://www.usace.army.mil/CECW/Documents/cecwo/reg/west_mt_finalsupp.pdf">http://www.usace.army.mil/CECW/Documents/cecwo/reg/west_mt_finalsupp.pdf</a>                                       | <b>U.S. Army Corps of Engineers.</b> 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0), ed. J. S. Wakeley, R. W. Lichvar, and C. V. Noble. ERDC/EL TR-10-3. Vicksburg, MS: U.S. Army Engineer Research and Development Center. |
| Wetland Classification   | USFWS / Cowardin Classification System  | <a href="http://www.fws.gov/nwi/Publications/Reports/Class_Manual/class_titlepg.htm">http://www.fws.gov/nwi/Publications/Reports/Class_Manual/class_titlepg.htm</a>                                   | <b>Cowardin, L. M., V. Carter, F. C. Golet, E. T. LaRoe.</b> 1979. Classification of wetlands and deepwater habitats of the United States. Government Printing Office, Washington, D.C.   |
|                          | Hydrogeomorphic Classification (HGM) System   | <a href="http://el.erdc.usace.army.mil/wetlands/pdfs/wrpde4.pdf">http://el.erdc.usace.army.mil/wetlands/pdfs/wrpde4.pdf</a>   | <b>Brinson, M. M.</b> (1993). "A hydrogeomorphic classification for wetlands," Technical Report WRP-DE-4, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.   |
| Wetland Rating           | Washington State Wetland Rating System  | <a href="https://fortress.wa.gov/ecy/publications/documents/1406029.pdf">https://fortress.wa.gov/ecy/publications/documents/1406029.pdf</a>   | <b>Hruby, T.</b> (2014). <i>Washington State Wetland Rating System for Western Washington: 2014 Update.</i> (Publication #14-06-029). Olympia, WA: Washington Department of Ecology.  |
|                          | Marysville Municipal Code   | <a href="https://www.codepublishing.com/WA/Marysville/">https://www.codepublishing.com/WA/Marysville/</a>   | Most current wetland rating system adopted per MMC 22E.010.060.1  |
| Wetland Indicator Status | 2016 National Wetland Plant List  | <a href="https://www.fws.gov/wetlands/documents/National-Wetland-Plant-List-2016-Wetland-Ratings.pdf">https://www.fws.gov/wetlands/documents/National-Wetland-Plant-List-2016-Wetland-Ratings.pdf</a> | <b>Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin.</b> 2016. <i>The National Wetland Plant List: 2016 wetland ratings.</i> Phytoneuron 2016-30: 1-17. Published 28 April 2016. ISSN 2153 733X  |
| Stream Classification    | Department of Natural Resources Water Typing System   | Forest Practices Water Typing: <a href="http://www.stage.dnr.wa.gov/forestpractices/watertyping/">http://www.stage.dnr.wa.gov/forestpractices/watertyping/</a>  | Washington Administrative Code (WAC) 222-16-030. DNR Water typing system.   |
| Plant Names              | USDA Plant Database   | <a href="http://plants.usda.gov/">http://plants.usda.gov/</a>   | Website   |
|                          | Flora of the Pacific Northwest  | <a href="http://www.washington.edu/ucpress/search/books/HITFLC.html">http://www.washington.edu/ucpress/search/books/HITFLC.html</a>   | <b>Hitchcock, C.L. and A. Cronquist.</b> 1973. Flora of the Pacific Northwest. University of Washington Press. Seattle, Washington.   |
| Soils Data               | NRCS Soil Survey  | <a href="http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx">http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx</a>   | Website GIS data based upon:<br><b>Debose, A. and M. Klungland.</b> 1983. Soil Survey of Snohomish County Area, Washington. United States Department of Agriculture, Soil Conservation Service, in cooperation with the Washington Agricultural Experiment Station.   |
| Hydric Soils Data        | Snohomish County Hydric Soils List  | <a href="http://www.wa.nrcs.usda.gov/technical/soils/hydric_lists/hydsoil-wa-653.pdf">http://www.wa.nrcs.usda.gov/technical/soils/hydric_lists/hydsoil-wa-653.pdf</a>                                 | <b>Natural Resources Conservation Service.</b> 1979. Hydric Soils List: Skagit County, Washington. U.S. Department of Agriculture. Washington D.C.  |
|                          | Washington Natural Heritage Program   | <a href="http://data-wadnr.opendata.arcgis.com/dataset/wadnr-natural-heritage-program">http://data-wadnr.opendata.arcgis.com/dataset/wadnr-natural-heritage-program</a>                               | <b>Washington Natural Heritage Program</b> (Data published 07/19/17). Endangered, threatened, and sensitive plants of Washington. Washington State  |

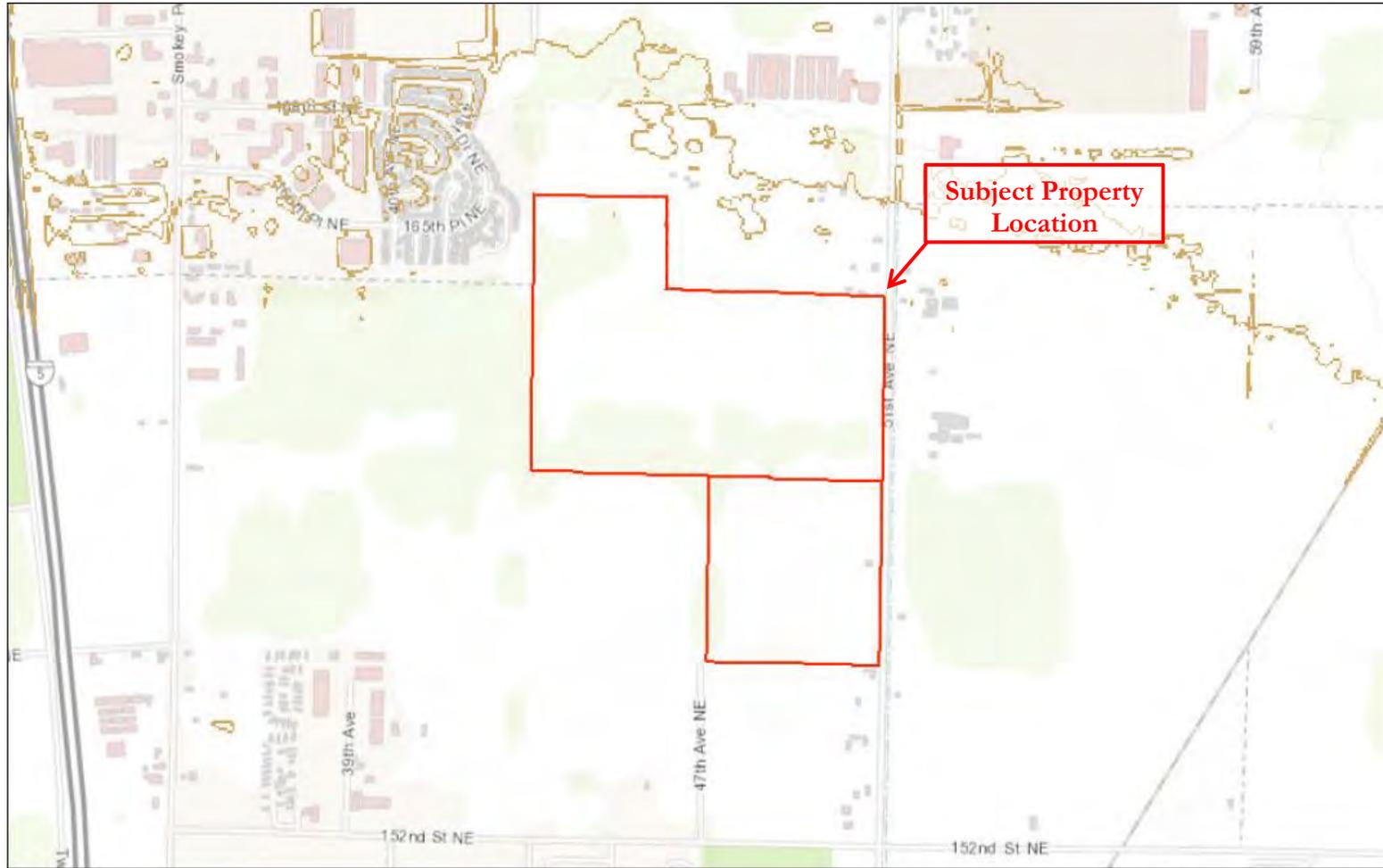
| Parameter                         | Method or Tool                           | Website   | Reference  |
|-----------------------------------|--|---|--|
| Threatened and Endangered Species |  | assets/wnhp-current-element-occurrences   | Department of Natural Resources, Washington Natural Heritage Program, Olympia, WA  |
|                                   | Washington Priority Habitats and Species | <a href="http://wdfw.wa.gov/hab/phspage.htm">http://wdfw.wa.gov/hab/phspage.htm</a>   | <b>Priority Habitats and Species (PHS) Program</b> (Data requested 01/25/18). Map of priority habitats and species in project vicinity. Washington Department of Fish and Wildlife (WDFW). |
|                                   | NOAA fisheries species list and maps     | <a href="http://www.nwr.noaa.gov/ESA-Salmon-Listings/Salmon-Populations/Index.cfm">http://www.nwr.noaa.gov/ESA-Salmon-Listings/Salmon-Populations/Index.cfm</a><br>and<br><a href="http://www.nmfs.noaa.gov/pr/species/">http://www.nmfs.noaa.gov/pr/species/</a> | Website  |
|                                   | USFWS species lists by County            | <a href="http://www.fws.gov/westwafwo/se/SE_List/Endangered_Species.asp">http://www.fws.gov/westwafwo/se/SE_List/Endangered_Species.asp</a>   | Website  |
| Species of Local Importance       | WDFW GIS Data                            | <a href="http://wdfw.wa.gov/mapping/salmonscape/">http://wdfw.wa.gov/mapping/salmonscape/</a>   | Website  |
| Report Preparation                | Marysville Municipal Code                | <a href="https://www.codepublishing.com/WA/Marysville/">https://www.codepublishing.com/WA/Marysville/</a>   | MMC Chapter 22E.010 Critical Areas   |

## Appendix B — Background Information

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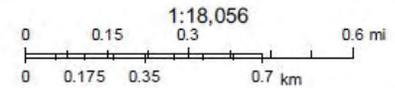
This appendix includes a USGS Topographic Map (B1); USFWS NWI map (B2); NRCS soil survey map (B3); Snohomish County wetland inventory (B4); Snohomish County stream inventory (B5); WDFW PHS map (B6); WDFW SalmonScape map (B7); and DNR stream typing map (B8).

# Appendix B1 – USGS Topographic Map



1/25/2018, 10:57:31 AM

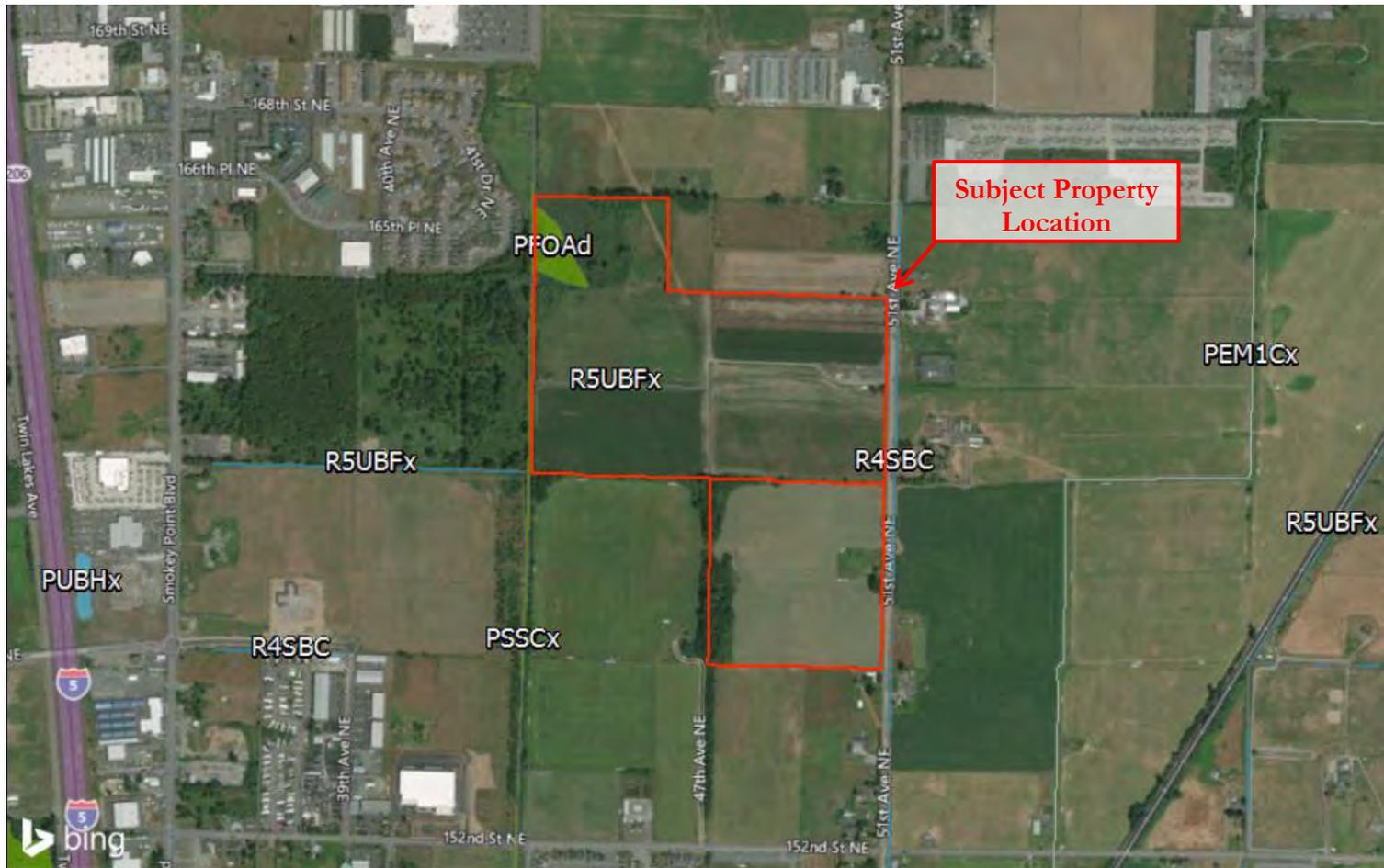
Snohomish\_Parcels\_Query result



Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey,

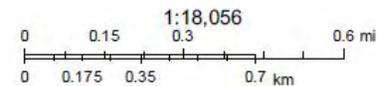
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## Appendix B2 – USFWS National Wetland Inventory Map



1/25/2018, 10:56:07 AM

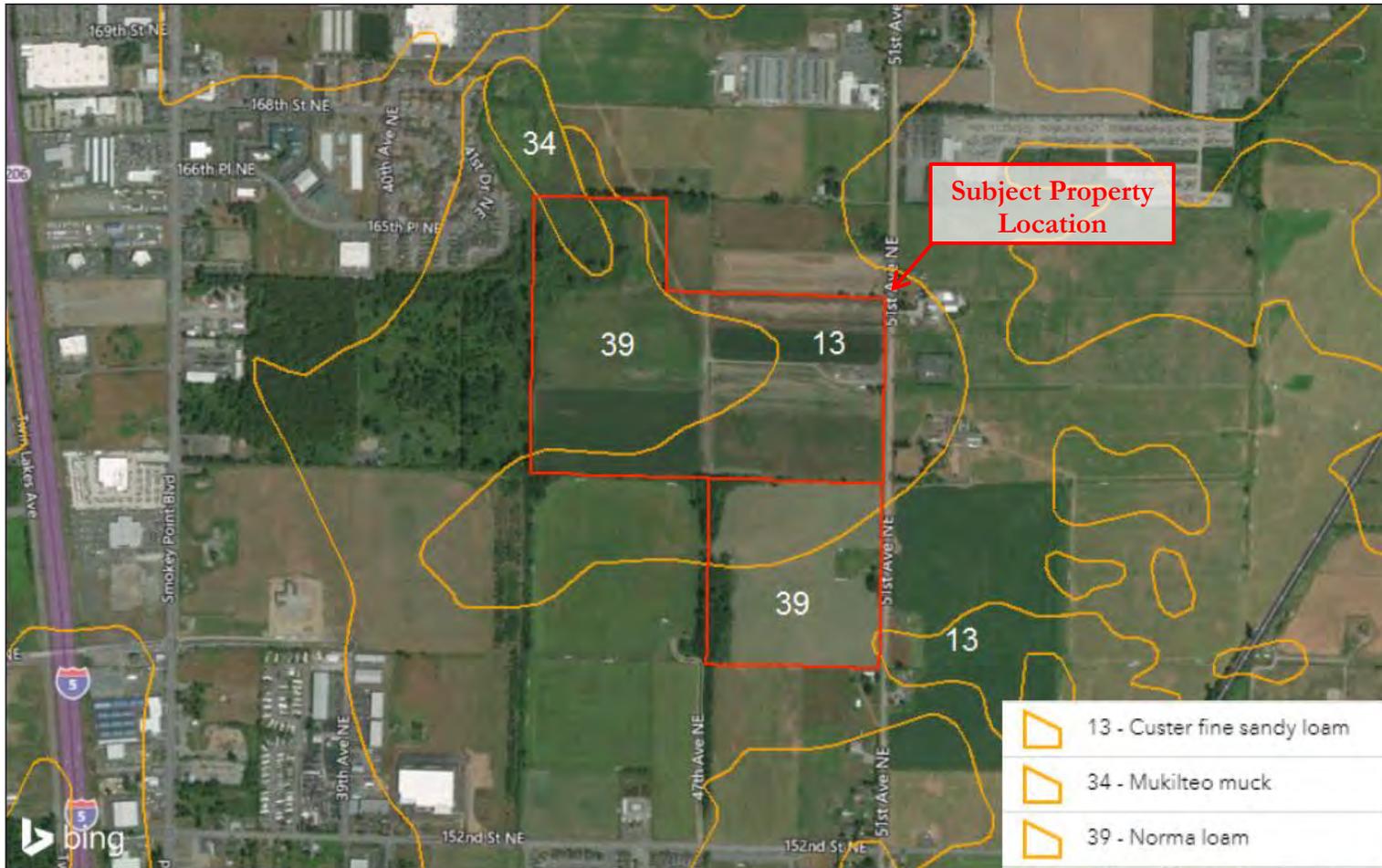
- Snohomish\_Parcels\_Query result
- Freshwater Forested/Shrub Wetland
  - Freshwater Pond
  - Freshwater Emergent Wetland
  - Riverine
- NWI\_Puget\_Sound



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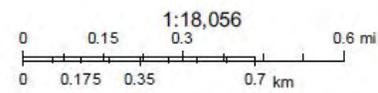
# Appendix B3 – NRCS Soil Survey Map



1/25/2018, 11:31:13 AM

Snohomish\_Parcels\_Query result

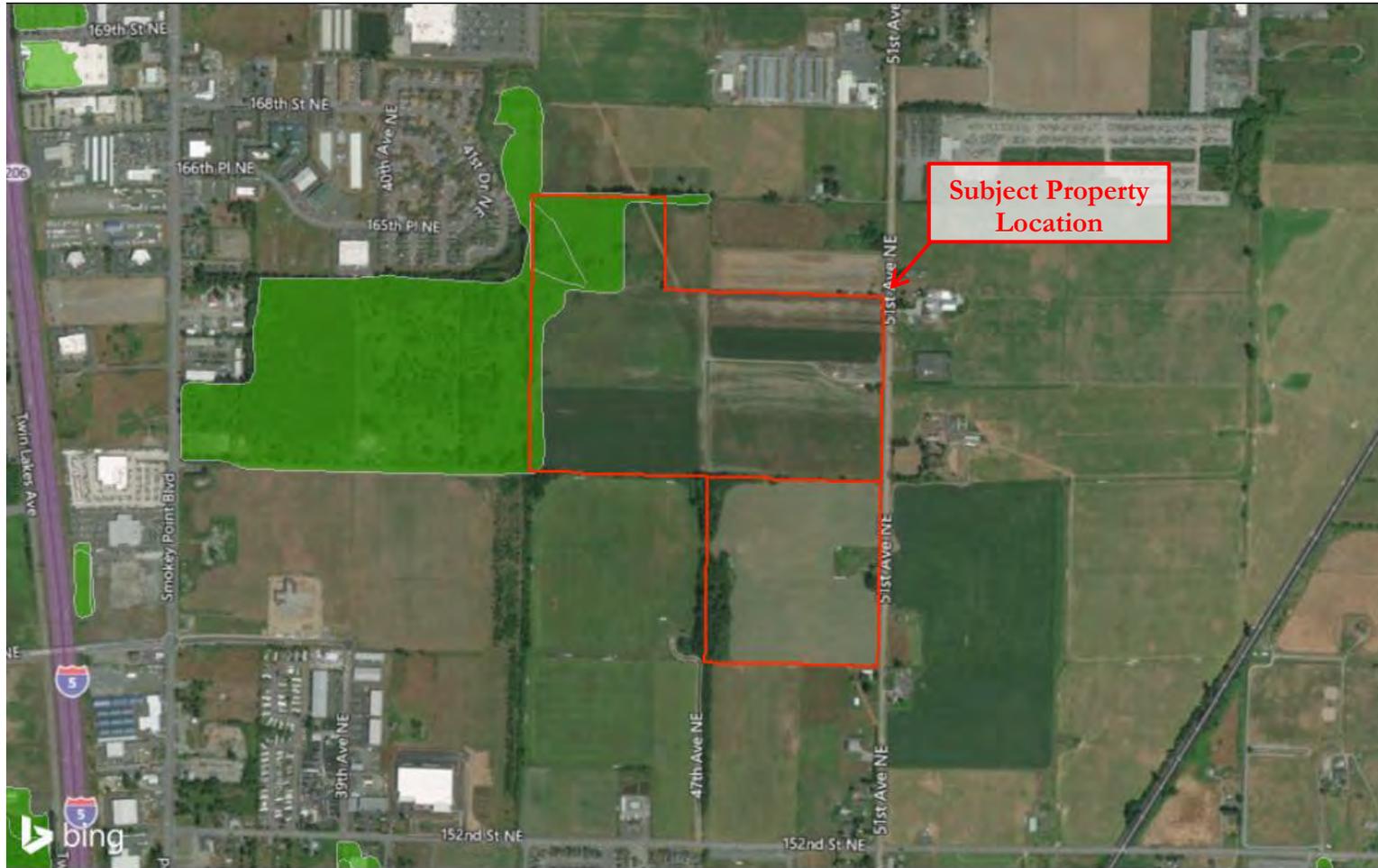
 NRCS Soil Survey



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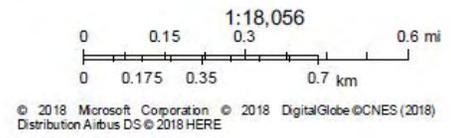
# Appendix B4 – Snohomish County Wetland Inventory Map



1/25/2018, 10:52:10 AM

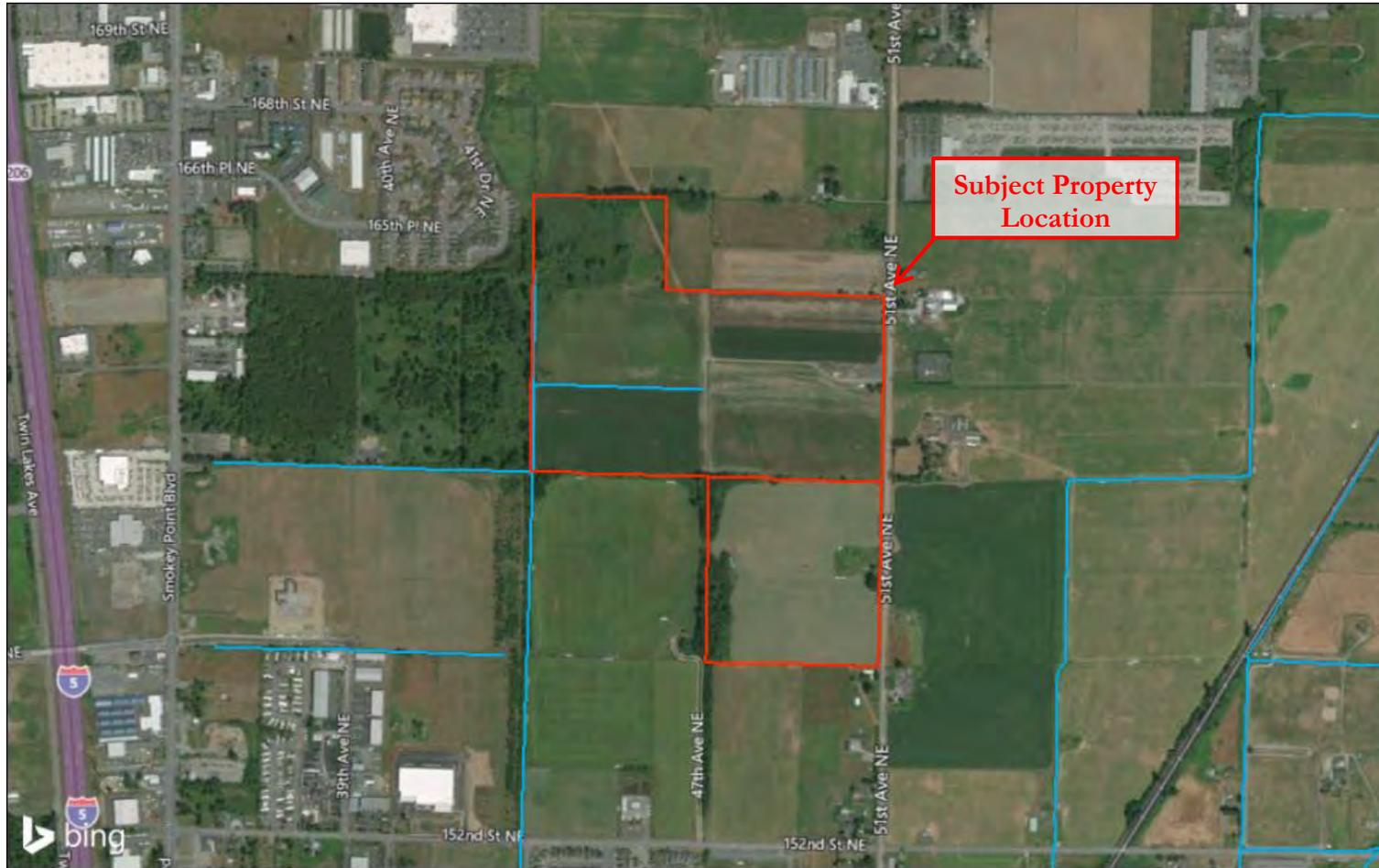
Snohomish\_Parcels\_Query result

 Snohomish\_Wetlands



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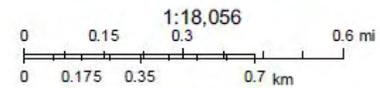
# Appendix B5 – Snohomish County Stream Inventory Map



1/25/2018, 10:51:17 AM

Snohomish\_Parcels\_Query result

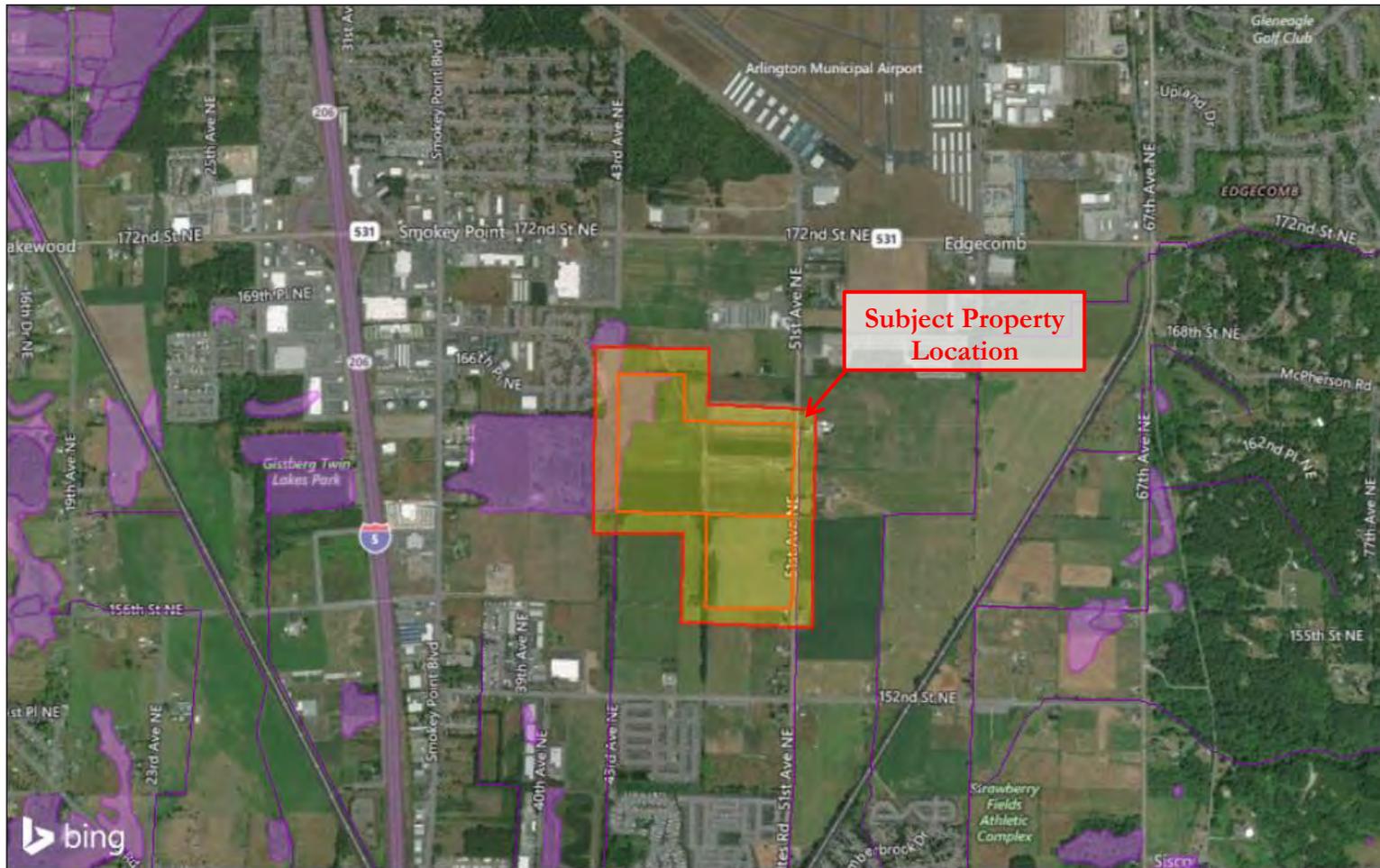
Snohomish\_Streams



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# Appendix B6 – WDFW PHS Map



1/25/2018, 11:45:23 AM

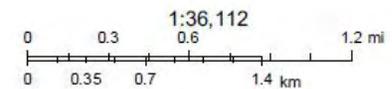
**Areas**

Override 1

Snohomish\_Parcels\_Query result

PT POLY

LN  AS MAPPED



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Distribution Airbus DS © 2018 HERE

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# WASHINGTON DEPARTMENT OF FISH AND WILDLIFE PRIORITY HABITATS AND SPECIES REPORT

SOURCE DATASET: PHSPlusPublic  
REPORT DATE: 01/25/2018 12.03

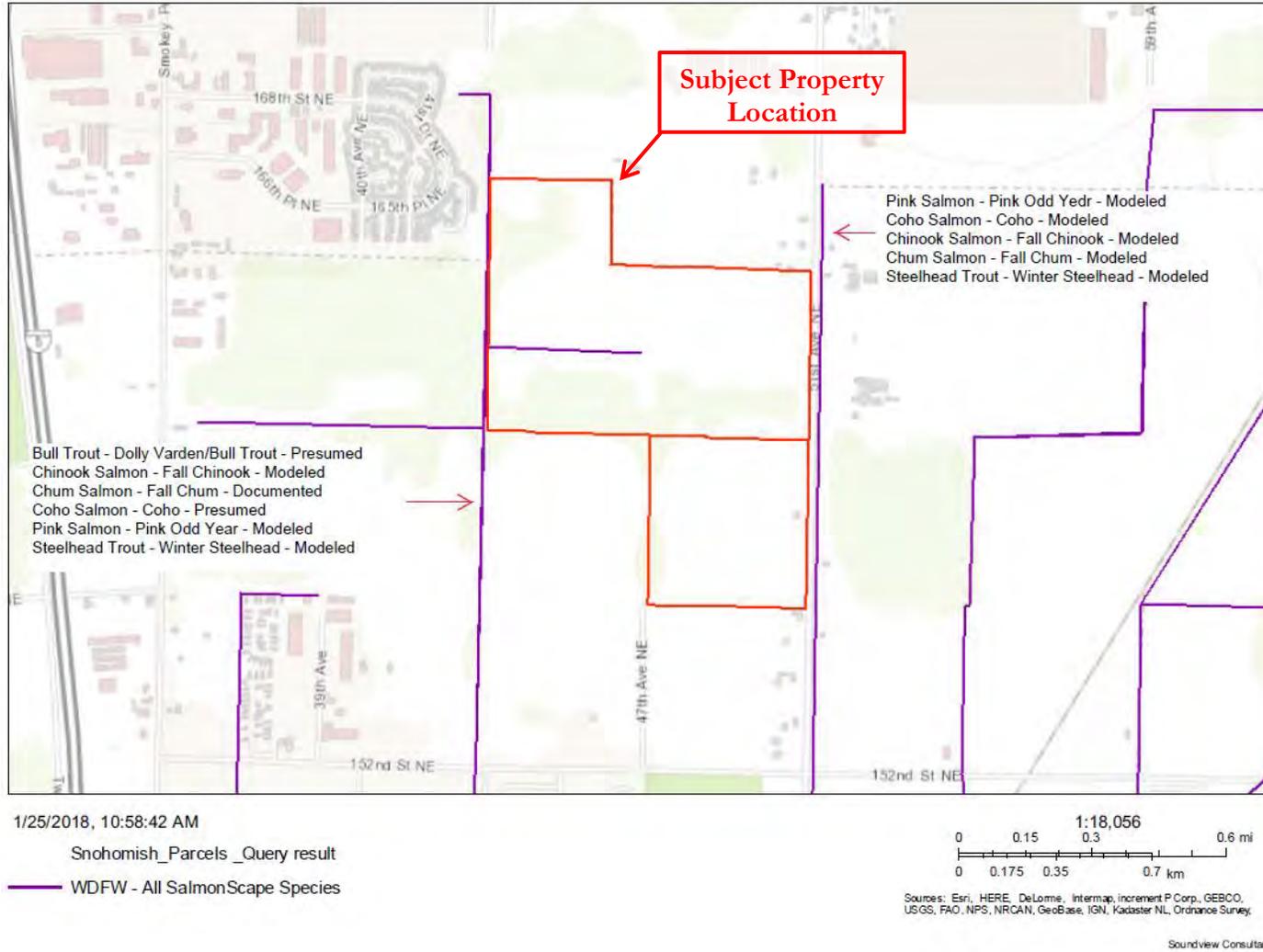
Query ID: P180125120252

| Common Name<br>Scientific Name<br>Notes           | Site Name<br>Source Dataset<br>Source Record<br>Source Date | Priority Area<br>Occurrence Type<br>More Information (URL)<br>Mgmt Recommendations   | Accuracy | Federal Status<br>State Status<br>PHS Listing Status | Sensitive Data<br>Resolution | Source Entity<br>Geometry Type           |
|---|---|--|----------|--|------------------------------|--|
| Coho<br>Oncorhynchus kisutch                      | SWIFD<br>34621  | Occurrence/Migration<br>Occurrence/migration<br><a href="http://wdfw.wa.gov/wlm/diversty/soc/soc.htm">http://wdfw.wa.gov/wlm/diversty/soc/soc.htm</a><br><a href="http://wdfw.wa.gov/publications/pub.php?">http://wdfw.wa.gov/publications/pub.php?</a> | NA       | N/A<br>N/A<br>PHS LISTED                             | N<br>AS MAPPED               | Lines                                    |
| Dolly Varden/ Bull Trout<br>Salvelinus malma      | SWIFD<br>34623  | Occurrence/Migration<br>Occurrence/migration<br><a href="http://wdfw.wa.gov/wlm/diversty/soc/soc.htm">http://wdfw.wa.gov/wlm/diversty/soc/soc.htm</a><br><a href="http://wdfw.wa.gov/publications/pub.php?">http://wdfw.wa.gov/publications/pub.php?</a> | NA       | N/A<br>N/A<br>PHS LISTED                             | N<br>AS MAPPED               | Lines                                    |
| Fall Chum<br>Oncorhynchus keta                    | SWIFD<br>34618  | Occurrence/Migration<br>Occurrence/migration<br><a href="http://wdfw.wa.gov/wlm/diversty/soc/soc.htm">http://wdfw.wa.gov/wlm/diversty/soc/soc.htm</a><br><a href="http://wdfw.wa.gov/publications/pub.php?">http://wdfw.wa.gov/publications/pub.php?</a> | NA       | N/A<br>N/A<br>PHS LISTED                             | N<br>AS MAPPED               | Lines                                    |
| Fall Chum<br>Oncorhynchus keta                    | SWIFD<br>34619  | Breeding Area<br>Breeding area<br><a href="http://wdfw.wa.gov/wlm/diversty/soc/soc.htm">http://wdfw.wa.gov/wlm/diversty/soc/soc.htm</a><br><a href="http://wdfw.wa.gov/publications/pub.php?">http://wdfw.wa.gov/publications/pub.php?</a>               | NA       | N/A<br>N/A<br>PHS LISTED                             | N<br>AS MAPPED               | Lines                                    |
| Freshwater Forested/Shrub                         | N/A<br>NWIWetlands  | Aquatic Habitat<br>Aquatic habitat<br><a href="http://www.ecy.wa.">http://www.ecy.wa.</a>  | NA       | N/A<br>N/A<br>PHS Listed                             | N<br>AS MAPPED               | US Fish and Wildlife Service<br>Polygons |
| Resident Coastal Cutthroat<br>Oncorhynchus clarki | SWIFD<br>34098  | Occurrence/Migration<br>Occurrence/migration<br><a href="http://wdfw.wa.gov/wlm/diversty/soc/soc.htm">http://wdfw.wa.gov/wlm/diversty/soc/soc.htm</a><br><a href="http://wdfw.wa.gov/publications/pub.php?">http://wdfw.wa.gov/publications/pub.php?</a> | NA       | N/A<br>N/A<br>PHS LISTED                             | N<br>AS MAPPED               | Lines                                    |
| Resident Coastal Cutthroat<br>Oncorhynchus clarki | SWIFD<br>34616  | Occurrence/Migration<br>Occurrence/migration<br><a href="http://wdfw.wa.gov/wlm/diversty/soc/soc.htm">http://wdfw.wa.gov/wlm/diversty/soc/soc.htm</a><br><a href="http://wdfw.wa.gov/publications/pub.php?">http://wdfw.wa.gov/publications/pub.php?</a> | NA       | N/A<br>N/A<br>PHS LISTED                             | N<br>AS MAPPED               | Lines                                    |

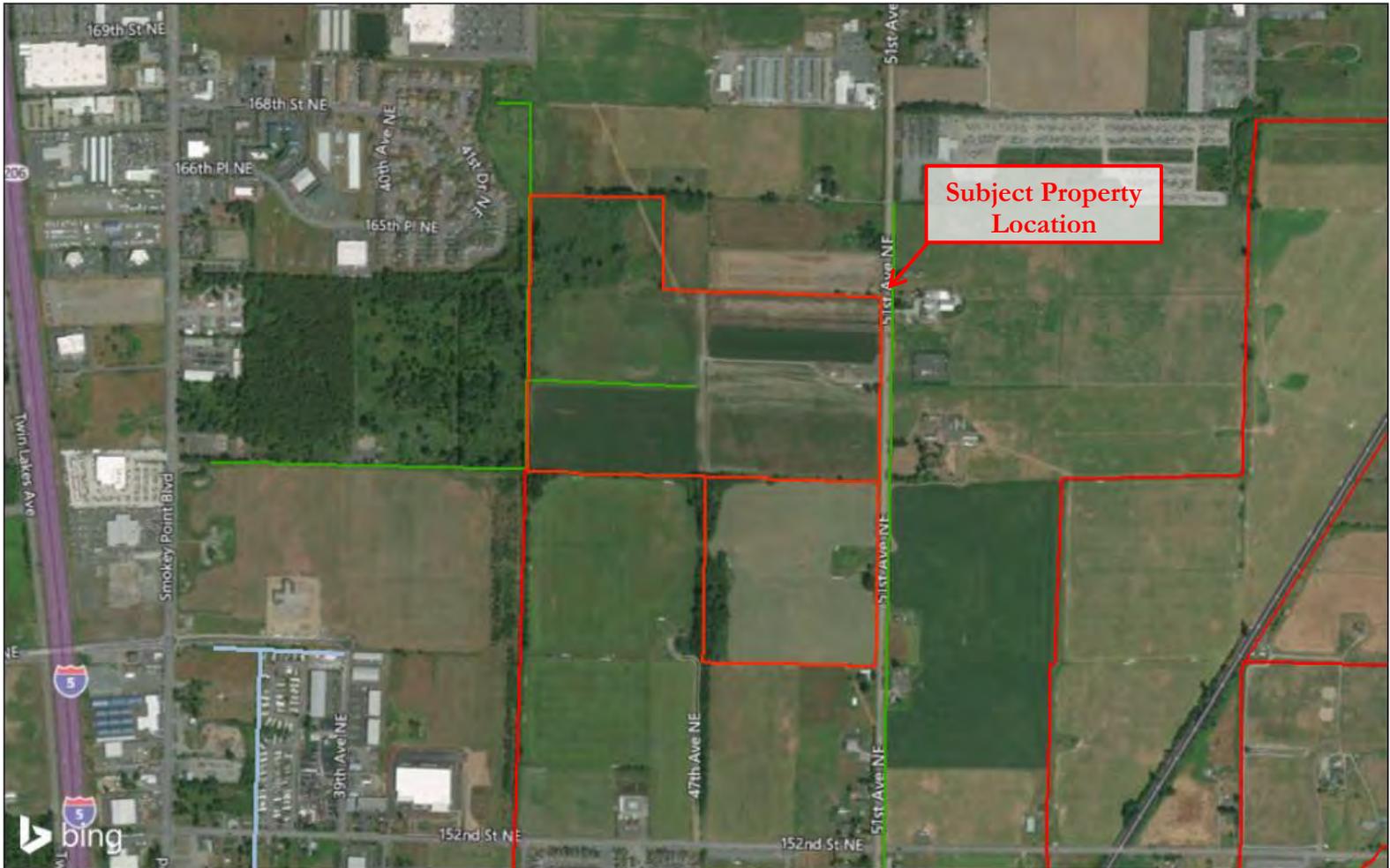
| Common Name     | Site Name                             | Priority Area   | Accuracy           | Federal Status           | Sensitive Data | Source Entity                             |
|-----------------|---------------------------------------|---|--------------------|--------------------------|----------------|---|
| Scientific Name | Source Dataset                        | Occurrence Type   |                    | State Status             | Resolution     | Geometry Type                             |
| Notes           | Source Record                         | More Information (URL)  |                    | PHS Listing Status       |                |   |
|                 | Source Date                           | Mgmt Recommendations  |                    |                          |                |   |
| Wetlands        | QUILCEDA CREEK<br>PHSREGION<br>902737 | Aquatic Habitat<br>N/A<br><a href="http://www.ecy.wa">http://www.ecy.wa</a> | 1/4 mile (Quarter) | N/A<br>N/A<br>PHS LISTED | N<br>AS MAPPED | WA Dept. of Fish and Wildlife<br>Polygons |

# Appendix B7 – WDFW SalmonScape Map

## WDFW Salmonscape

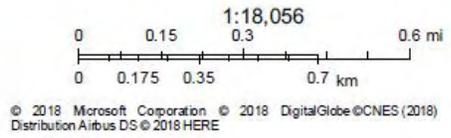


# Appendix B8 – DNR Steam Typing Map



1/25/2018, 10:53:07 AM

Snohomish\_Parcels\_Query result  
**DNR - Stream Typing**  
— Type N, Np, Ns  
— U, unknown  
— Type F

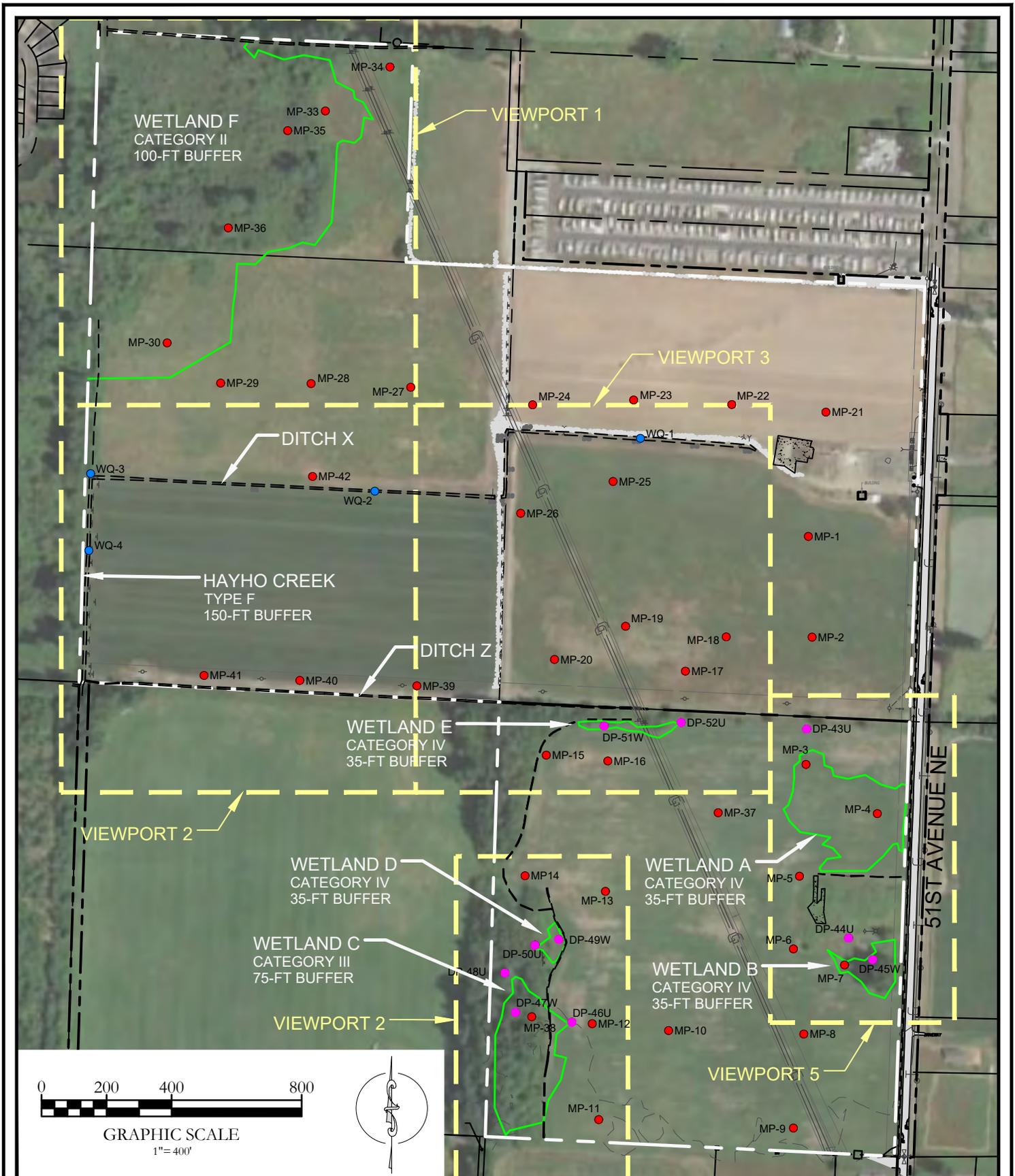


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# Appendix C — Existing Conditions Map

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# WILLIAMS INVESTMENTS - EXISTING CONDITIONS



WILLIAMS INVESTMENTS  
 15808 & 16204 51ST AVENUE NE  
 MARYSVILLE, WASHINGTON 98271-7506  
 THE SE ¼ OF SECTION 28, TOWNSHIP 31,  
 RANGE 5E, W.M.

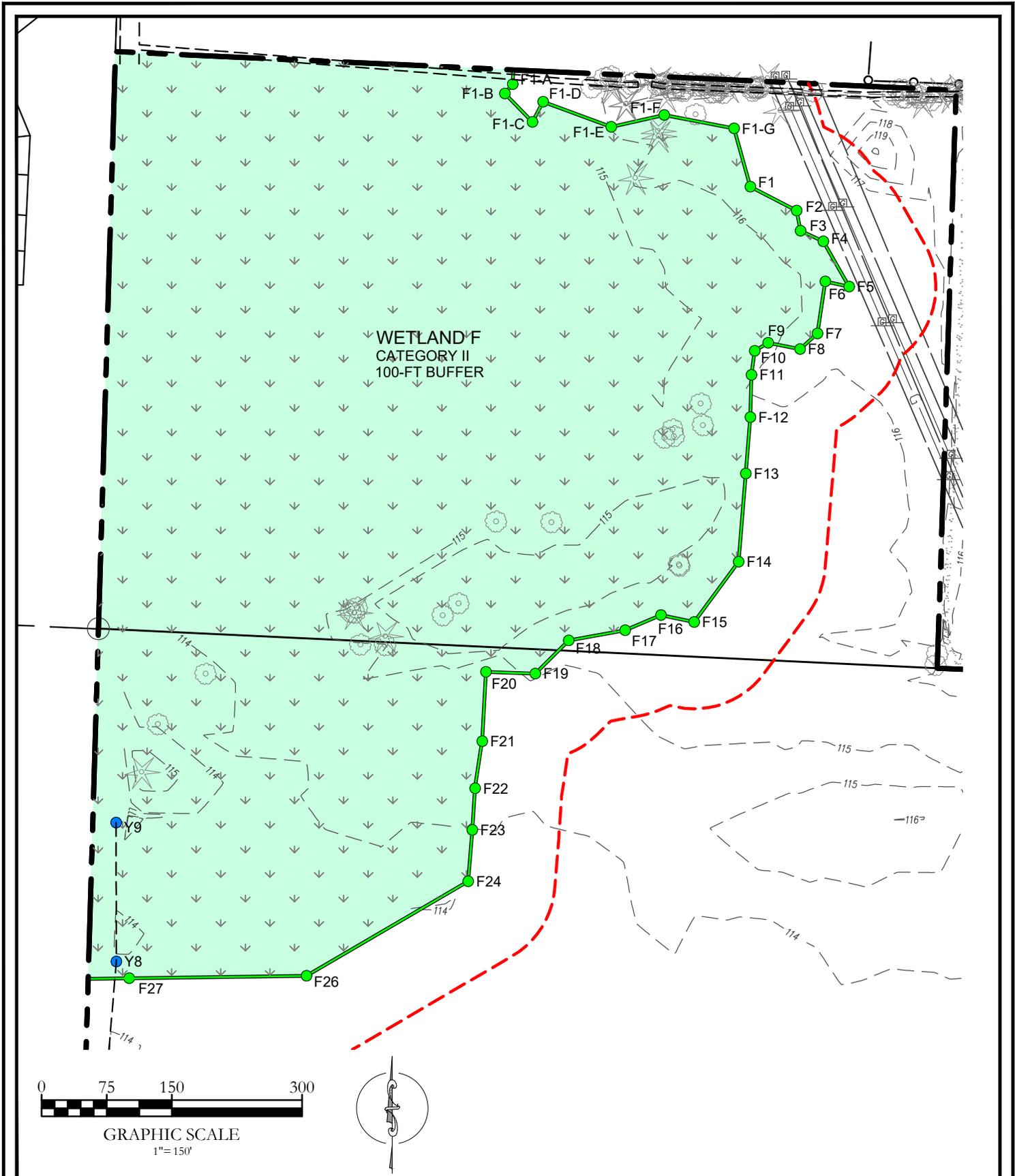


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 GIG HARBOR, WASHINGTON 98335 F. 253.514.8954  
 WWW.SOUNDVIEWCONSULTANTS.COM

|                 |
|-----------------|
| DATE: 1/28/2020 |
| JOB: 1778.0003  |
| BY: MW          |
| SCALE: AS SHOWN |
| SHEET: 1        |

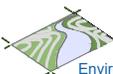
S:\CURRENT\1778 Williams Investments\1778.0003 51st. Ave NE\Graphics & Maps\CAD\A - CURRENT SVC DRAWINGS\A -  
 Planview\_Base.dwg (2021-01) base.dwg

# WILLIAMS INVESTMENTS - VIEWPORT 1



**WILLIAMS INVESTMENTS**  
 15808 & 16204 51ST AVENUE NE  
 MARYSVILLE, WASHINGTON 98271-7506

THE SE ¼ OF SECTION 28, TOWNSHIP 31,  
 RANGE 5E, W.M.



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 Environmental Assessment • Planning • Land Use Solutions

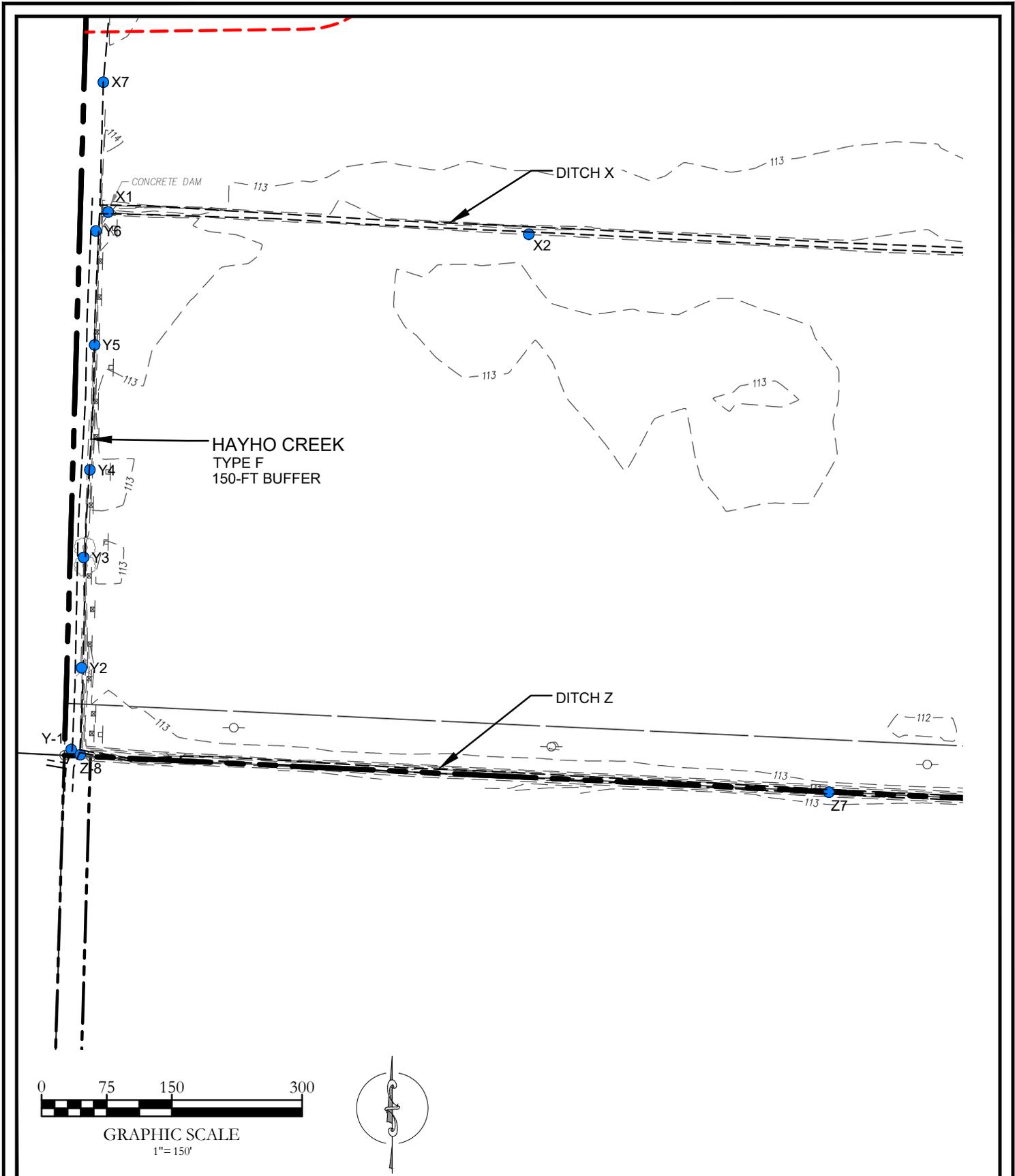
2907 HARBORVIEW DRIVE, SUITE D P. 253.514.8952  
 GIG HARBOR, WASHINGTON 98335 F. 253.514.8954

[WWW.SOUNDVIEWCONSULTANTS.COM](http://WWW.SOUNDVIEWCONSULTANTS.COM)

|                 |
|-----------------|
| DATE: 1/28/2020 |
| JOB: 1778.0003  |
| BY: MW          |
| SCALE: AS SHOWN |
| SHEET: 2        |

S:\CURRENT\1778 Williams Investments\1778.0003 51st. Ave NE\Graphics & Maps\CAD\A - CURRENT SVC DRAWINGS\A -  
 Payment Base\DWG\1778.0003 (2021-01) base.dwg

# WILLIAMS INVESTMENTS - VIEWPORT 2



**WILLIAMS INVESTMENTS**  
 15808 & 16204 51ST AVENUE NE  
 MARYSVILLE, WASHINGTON 98271-7506  
 THE SE ¼ OF SECTION 28, TOWNSHIP 31,  
 RANGE 5E, W.M.

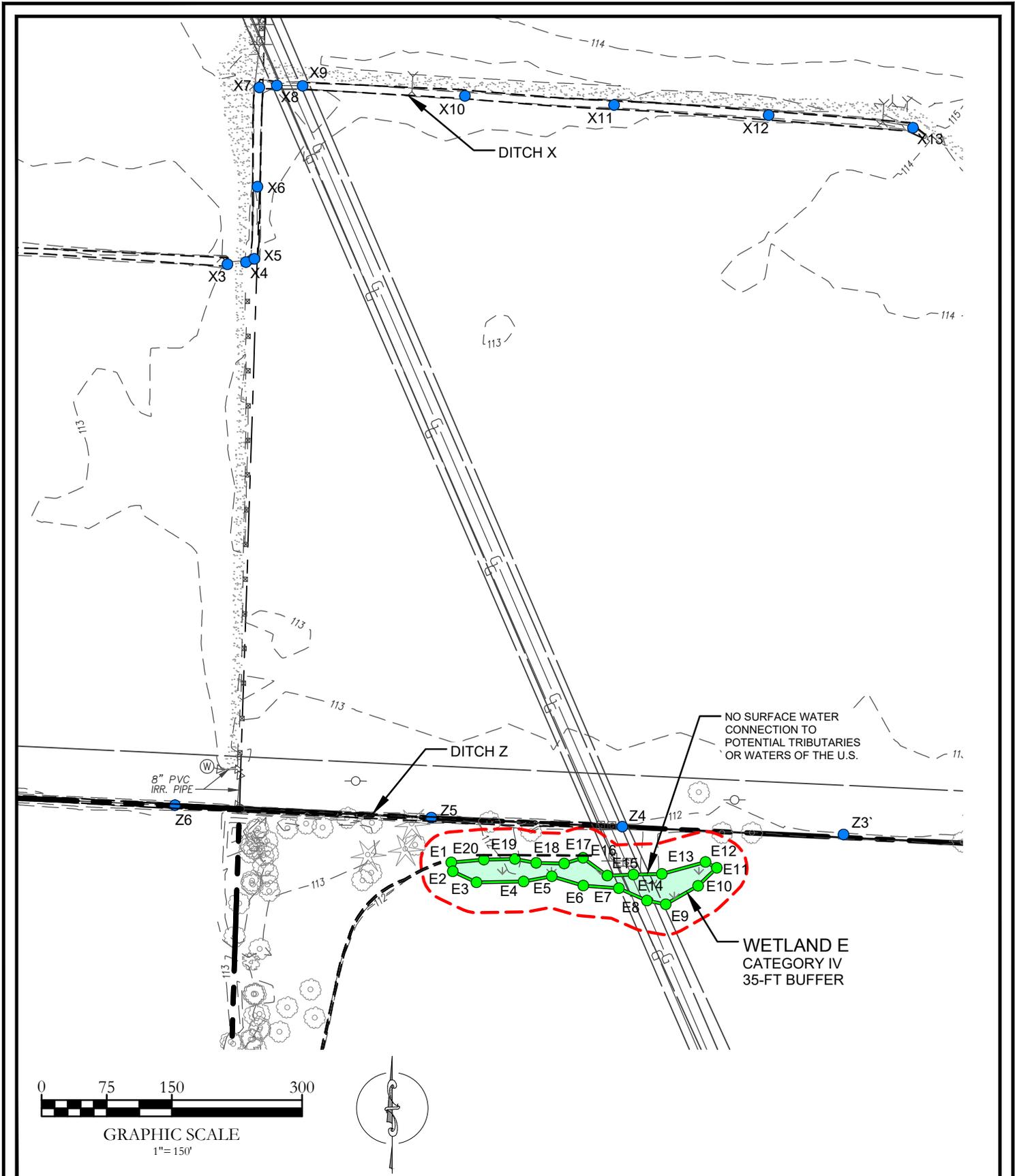


**Soundview Consultants LLC**  
 Environmental Assessment • Planning • Land Use Solutions  
 2907 HARBORVIEW DRIVE, SUITE D P. 253.514.8952  
 GIG HARBOR, WASHINGTON 98335 F. 253.514.8954  
[WWW.SOUNDVIEWCONSULTANTS.COM](http://WWW.SOUNDVIEWCONSULTANTS.COM)

|                 |
|-----------------|
| DATE: 1/28/2020 |
| JOB: 1778.0003  |
| BY: MW          |
| SCALE: AS SHOWN |
| SHEET: 3        |

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 Planview Base.dwg (2021-01) base.dwg

# WILLIAMS INVESTMENTS - VIEWPORT 3



**WILLIAMS INVESTMENTS**  
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 MARYSVILLE, WASHINGTON 98271-7506  
 THE SE ¼ OF SECTION 28, TOWNSHIP 31,  
 RANGE 5E, W.M.

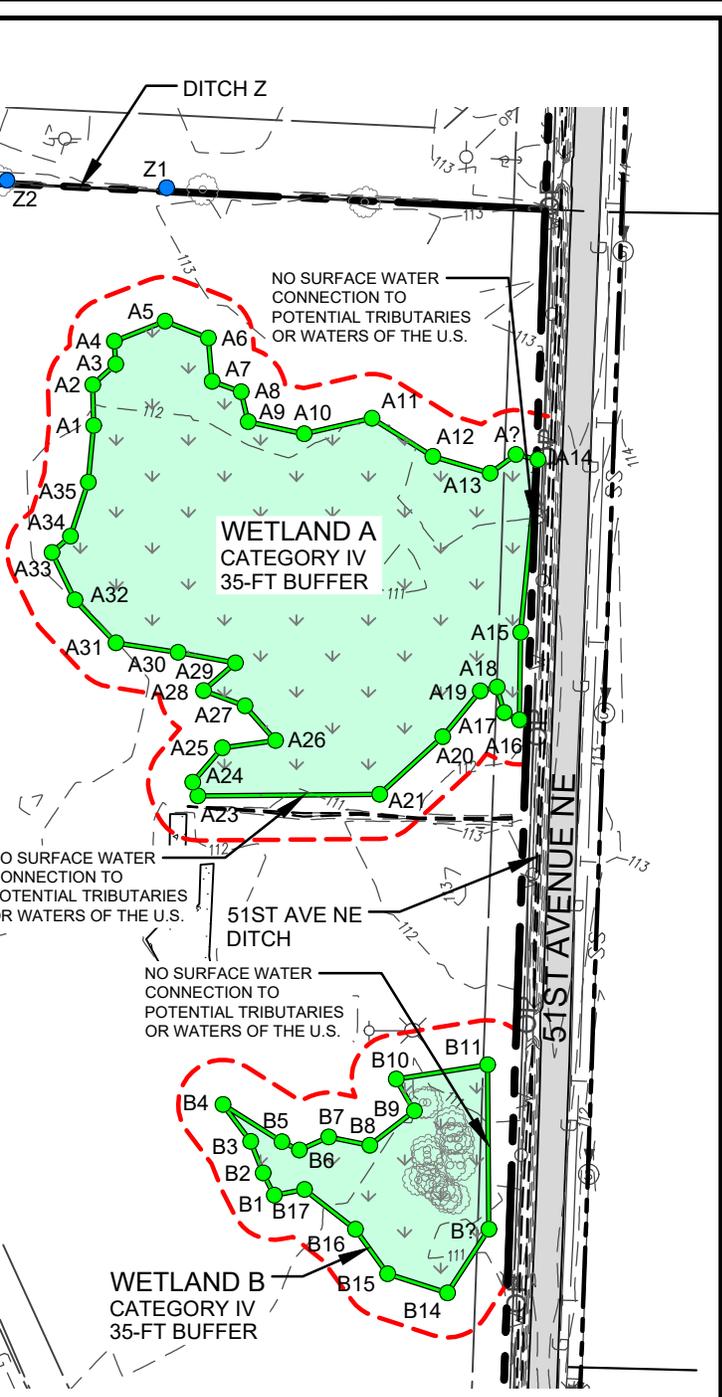
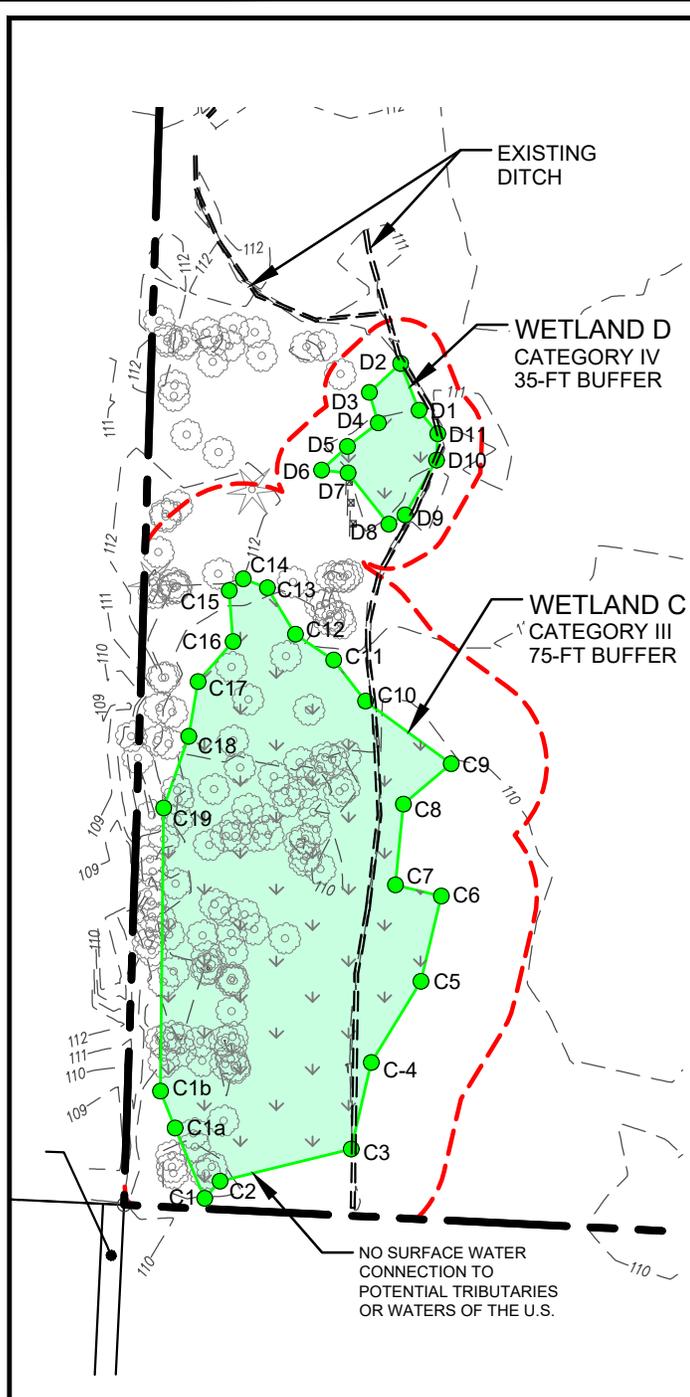


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|                 |
|-----------------|
| DATE: 1/28/2020 |
| JOB: 1778.0003  |
| BY: MW          |
| SCALE: AS SHOWN |
| SHEET: 4        |

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 Payment Base.dwg (2021-01) base.dwg

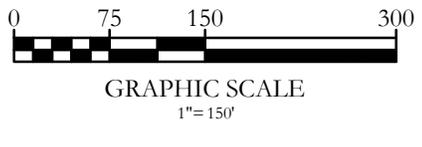
# WILLIAMS INVESTMENTS - VIEWPORTS 4 & 5



**VIEWPORT 4**

**VIEWPORT 5**

SCALE: 1"=150'



**WILLIAMS INVESTMENTS**  
15808 & 16204 51ST AVENUE NE  
MARYSVILLE, WASHINGTON 98271-7506

THE SE ¼ OF SECTION 28, TOWNSHIP 31,  
RANGE 5E, W.M.

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|                 |
|-----------------|
| DATE: 1/28/2020 |
| JOB: 1778.0003  |
| BY: MW          |
| SCALE: AS SHOWN |
| SHEET: 5        |

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# Appendix D —Approved Jurisdictional Determinations



DEPARTMENT OF THE ARMY  
CORPS OF ENGINEERS, SEATTLE DISTRICT  
P.O. BOX 3755  
SEATTLE, WASHINGTON 98124-3755

Regulatory Branch

February 24, 2021

Mr. Ryan Kilby  
Williams Investments  
2517 Colby Avenue  
Everett, Washington 98201

Reference: NWS-2021-130  
Williams Investments  
(AJD Request)

Dear Mr. Kilby:

On February 18, 2021, we conducted a review of your Wetland Delineation, Groundwater Monitoring, and Fish and Wildlife Habitat Assessment Report for Williams Investments dated January 2021 for the property at Marysville, Washington in response to your request for verification of the jurisdictional limits of waters of the U.S. in the review area as shown on the enclosed drawings dated February 16, 2021. The U.S. Army Corps of Engineers has determined that Wetland F is a water of the U.S. This determination applies only to the review area. Other waters and wetlands that may occur on this property outside the review area are not the subject of this determination.

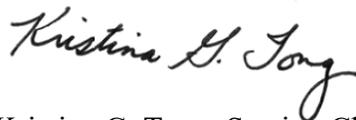
We have also determined that Hayho Creek, Ditch X, Ditch Z, the 51<sup>st</sup> Avenue West Ditch, the linear drainage feature adjacent to Wetland A, the southern drainage ditch, and Wetlands A – E are not waters of the U.S. because they are excluded non-waters of the U.S. per 33 CFR Part 328.3 (b). As such, work that would occur within these areas does not require Department of the Army authorization under Section 404 of the Clean Water Act. Other state and local regulations may still apply to these wetlands. For example, the Washington State Department of Ecology (Ecology) may regulate these wetlands. For information on how to obtain State approval for your project, you should contact Ecology's Federal Permit Coordinator at [ecyrefedpermits@ecy.wa.gov](mailto:ecyrefedpermits@ecy.wa.gov) or at (360) 407-6068. Information regarding State permitting requirements can also be found at the following website: <https://ecology.wa.gov/Water-Shorelines/Wetlands/Regulations>. We are sending a copy of this letter to Ecology and to the Environmental Protection Agency's Aquatic Resources Unit.

This approved jurisdictional determination is valid for a period of five years from the date of this letter unless new information warrants revisions of the determination. A copy of this jurisdictional determination, dated February 24, 2021 is enclosed and can be found on our website at [www.nws.usace.army.mil](http://www.nws.usace.army.mil) select "Regulatory Branch, Permit Information" and then

“Jurisdictional Determinations”. If you object to this determination, you may request an administrative appeal under our regulations (33 Code of Federal Regulations, Part 331) as described in the enclosed *Notification of Administrative Appeal Options and Process and Request for Appeal* form.

A copy of this letter with drawings will be furnished to Mr. Jon Pickett at [jon@soundviewconsultants.com](mailto:jon@soundviewconsultants.com). If you propose to do any work in the areas identified to be waters of the U.S., you should contact our office prior to commencing work to determine permit requirements. Please note that conducting certain activities in waters of the U.S. without Department of the Army authorization would violate Federal law. If you have any questions, please contact Ms. Amanda Nadjkovic at [amanda.n.nadjkovic@usace.army.mil](mailto:amanda.n.nadjkovic@usace.army.mil) or at (206) 316-3156.

Sincerely,

A handwritten signature in cursive script that reads "Kristina G. Tong".

Kristina G. Tong, Section Chief  
Regulatory Branch

Enclosures



DEPARTMENT OF THE ARMY  
CORPS OF ENGINEERS, SEATTLE DISTRICT  
P.O. BOX 3755  
SEATTLE, WASHINGTON 98124-3755

Regulatory Branch

July 13, 2021

Mr. Ryan Kilby  
Williams Investments  
2517 Colby Avenue  
Everett, Washington 98201

Reference: NWS-2021-130  
Williams Investments  
(AJD Request)

Dear Mr. Kilby:

Based on an availability of new information, the U.S. Army Corps of Engineers (Corps) has re-evaluated your request for verification of the jurisdictional limits of Wetland F, located at Marysville, Washington in the review area as shown on the enclosed drawings dated February 16, 2021. The Corps has determined that Wetland F is not a water of the U.S. because it is an excluded non-water of the U.S. per 33 CFR Part 328.3 (b). As such, work that would occur within this area does not require Department of the Army authorization under Section 404 of the Clean Water Act. This determination supersedes the previous determination by this office dated February 24, 2021. All other determinations contained in the original approved jurisdictional determination, dated February 24, 2021, remain unchanged.

Other state and local regulations may still apply to this wetland. For example, the Washington State Department of Ecology (Ecology) may regulate this wetland. For information on how to obtain State approval for your project, you should contact Ecology's Federal Permit Coordinator at [ecyrefedpermits@ecy.wa.gov](mailto:ecyrefedpermits@ecy.wa.gov) or at (360) 407-6068. Information regarding State permitting requirements can also be found at the following website: <https://ecology.wa.gov/Water-Shorelines/Wetlands/Regulations>. We are sending a copy of this letter to Ecology and to the Environmental Protection Agency's Aquatic Resources Unit.

This approved jurisdictional determination is valid for a period of five years from the date of this letter unless new information warrants revisions of the determination. A copy of this jurisdictional determination, dated June 16, 2021, is enclosed and can be found on our website at [www.nws.usace.army.mil](http://www.nws.usace.army.mil) select "Regulatory Branch, Permit Information" and then "Jurisdictional Determinations". If you object to this determination, you may request an administrative appeal under our regulations (33 Code of Federal Regulations, Part 331) as described in the enclosed *Notification of Administrative Appeal Options and Process and Request for Appeal* form.

A copy of this letter with drawings will be furnished to Mr. Jon Pickett at [jon@soundviewconsultants.com](mailto:jon@soundviewconsultants.com). If you propose to do any work in the areas identified to be waters of the U.S., you should contact our office prior to commencing work to determine permit requirements. Please note that conducting certain activities in waters of the U.S. without Department of the Army authorization would violate Federal law. If you have any questions, please contact Ms. Amanda Nadjkovic at [amanda.n.nadjkovic@usace.army.mil](mailto:amanda.n.nadjkovic@usace.army.mil) or at (206) 316-3156.

Sincerely,

A handwritten signature in black ink that reads "Amanda Nadjkovic". The signature is written in a cursive style with a large initial "A".

Amanda Nadjkovic, Project Manager  
Regulatory Branch

Enclosures

cc:

Washington State Department of Ecology ([ecyrefedpermits@ecy.wa.gov](mailto:ecyrefedpermits@ecy.wa.gov))  
EPA, Region 10 ([R10\\_Wetlands\\_and\\_Oceans@epa.gov](mailto:R10_Wetlands_and_Oceans@epa.gov))

# Appendix E — Data Sheets

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

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 03/01/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-1  
 Investigator(s): Emily Swaim, Jon Pickett, Richard Peel Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): None Slope (%): 0  
 Subregion (LRR): A-2 Lat: 48.142584 Long: -122.16336022 Datum: WGS 84  
 Soil Map Unit Name: Custer fine 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 , Soil , or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |   |
|---|---|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | <b>Is the Sampled Area<br/>within a Wetland?</b><br>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks: <u>Not all three wetland criteria observed, only hydrophytic vegetation present ; disked; non-wetland hydrology confirmed by groundwater monitoring study</u>  |   |

### VEGETATION – Use scientific names of plants.

|   | Absolute % Cover | Dominant Species? | Indicator Status |  |
|---|------------------|-------------------|------------------|--|
| <b>Tree Stratum</b> (Plot size: <u>30 ft</u> )          |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| <b>Sapling/Shrub Stratum</b> (Plot size: <u>15 ft</u> ) |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
| 5. _____  | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| <b>Herb Stratum</b> (Plot size: <u>5 ft</u> )           |                  |                   |                  |  |
| 1. <u>Viola glabella</u>                                | <u>50</u>        | <u>Yes</u>        | <u>FACW</u>      |  |
| 2. <u>Cardamine oligosperma</u>                         | <u>50</u>        | <u>Yes</u>        | <u>FAC</u>       |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
| 5. _____  | _____            | _____             | _____            |  |
| 6. _____  | _____            | _____             | _____            |  |
| 7. _____  | _____            | _____             | _____            |  |
| 8. _____  | _____            | _____             | _____            |  |
| 9. _____  | _____            | _____             | _____            |  |
| 10. _____   | _____            | _____             | _____            |  |
| 11. _____   | _____            | _____             | _____            |  |
|   | <u>100</u>       | = Total Cover     |                  |  |
| <b>Woody Vine Stratum</b> (Plot size: <u>30 ft</u> )    |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| <b>% Bare Ground in Herb Stratum</b> <u>0</u>           |                  |                   |                  |  |

**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 50 x 2 = 100  
 FAC species 50 x 3 = 150  
 FACU species 0 x 4 = 0  
 UPL species 0 x 5 = 0  
 Column Totals: 100 (A) 250 (B)  
 Prevalence Index = B/A = 2.5

**Hydrophytic Vegetation Indicators:**  
 Rapid Test for Hydrophytic Vegetation  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes  No

Remarks: Hydrophytic vegetation criterion observed through dominance test indicator.



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

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 03/01/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-10  
 Investigator(s): Richard Peel, Emily Swaim Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): Concave Slope (%): 0  
 Subregion (LRR): A-2 Lat: 48.138471 Long: -122.16498662 Datum: WGS 84  
 Soil Map Unit Name: Norma 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 , Soil , or Hydrology  significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology  naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |   |
|---|---|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | <b>Is the Sampled Area<br/>within a Wetland?</b><br>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks: <b>Not all three wetland criteria observed, hydrophytic vegetation &amp; wetland hydrology present. Non-wetland hydrology confirmed by groundwater monitoring study.</b>   |   |

### VEGETATION – Use scientific names of plants.

|   | Absolute % Cover | Dominant Species? | Indicator Status |  |
|---|------------------|-------------------|------------------|--|
| <b>Tree Stratum</b> (Plot size: <u>30 ft</u> )          |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| <b>Sapling/Shrub Stratum</b> (Plot size: <u>15 ft</u> ) |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
| 5. _____  | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| <b>Herb Stratum</b> (Plot size: <u>5 ft</u> )           |                  |                   |                  |  |
| 1. <u>Holcus lanatus</u>                                | <u>25</u>        | <u>Yes</u>        | <u>FAC</u>       |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
| 5. _____  | _____            | _____             | _____            |  |
| 6. _____  | _____            | _____             | _____            |  |
| 7. _____  | _____            | _____             | _____            |  |
| 8. _____  | _____            | _____             | _____            |  |
| 9. _____  | _____            | _____             | _____            |  |
| 10. _____   | _____            | _____             | _____            |  |
| 11. _____   | _____            | _____             | _____            |  |
|   | <u>25</u>        | = Total Cover     |                  |  |
| <b>Woody Vine Stratum</b> (Plot size: <u>30 ft</u> )    |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| <b>% Bare Ground in Herb Stratum</b> <u>75</u>          |                  |                   |                  |  |

**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 0 x 2 = 0  
 FAC species 25 x 3 = 75  
 FACU species 0 x 4 = 0  
 UPL species 0 x 5 = 0  
 Column Totals: 25 (A) 75 (B)  
 Prevalence Index = B/A = 3

**Hydrophytic Vegetation Indicators:**  
 Rapid Test for Hydrophytic Vegetation  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes  No

Remarks: **Hydrophytic vegetation criterion observed through dominance test indicator.**

**SOIL**

Sampling Point: DP-10

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

| Depth (inches) | Matrix        |     | Redox Features |   |                   | Loc <sup>2</sup> | Texture | Remarks |
|----------------|---------------|-----|----------------|---|-------------------|------------------|---------|---------|
|                | Color (moist) | %   | Color (moist)  | % | Type <sup>1</sup> |                  |         |         |
| 0 - 10         | 10YR 3/2      | 100 |                |   |                   |                  | SaLo    |         |
| 10 - 30        | 10YR 3/2      | 100 |                |   |                   |                  | Sand    |         |
|                |               |     |                |   |                   |                  |         |         |
|                |               |     |                |   |                   |                  |         |         |
|                |               |     |                |   |                   |                  |         |         |
|                |               |     |                |   |                   |                  |         |         |
|                |               |     |                |   |                   |                  |         |         |
|                |               |     |                |   |                   |                  |         |         |

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

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

|   |  |   |
|---|--|---|
| <input type="checkbox"/> Histosol (A1)  | <input type="checkbox"/> Sandy Redox (S5)                                  | <b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b><br><input type="checkbox"/> 2 cm Muck (A10)<br><input type="checkbox"/> Red Parent Material (TF2)<br><input type="checkbox"/> Very Shallow Dark Surface (TF12)<br><input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Histic Epipedon (A2)   | <input type="checkbox"/> Stripped Matrix (S6)                              |   |
| <input type="checkbox"/> Black Histic (A3)  | <input type="checkbox"/> Loamy Mucky Mineral (F1) ( <b>except MLRA 1</b> ) |   |
| <input type="checkbox"/> Hydrogen Sulfide (A4)  | <input type="checkbox"/> Loamy Gleyed Matrix (F2)                          |   |
| <input type="checkbox"/> Depleted Below Dark Surface (A11)  | <input type="checkbox"/> Depleted Matrix (F3)                              |   |
| <input type="checkbox"/> Thick Dark Surface (A12)   | <input type="checkbox"/> Redox Dark Surface (F6)                           |   |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)   | <input type="checkbox"/> Depleted Dark Surface (F7)                        |   |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4)   | <input type="checkbox"/> Redox Depressions (F8)                            |   |
| <sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. |  |   |

**Restrictive Layer (if present):**  
Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

**Hydric Soil Present?** Yes  No

Remarks:  
No hydric soils indicators observed.

**HYDROLOGY**

**Wetland Hydrology Indicators:**

|   |   |
|---|---|
| <b>Primary Indicators (minimum of one required; check all that apply)</b>   | <b>Secondary Indicators (2 or more required)</b>  |
| <input type="checkbox"/> Surface Water (A1)<br><input checked="" type="checkbox"/> High Water Table (A2)<br><input checked="" type="checkbox"/> Saturation (A3)<br><input type="checkbox"/> Water Marks (B1)<br><input type="checkbox"/> Sediment Deposits (B2)<br><input type="checkbox"/> Drift Deposits (B3)<br><input type="checkbox"/> Algal Mat or Crust (B4)<br><input type="checkbox"/> Iron Deposits (B5)<br><input type="checkbox"/> Surface Soil Cracks (B6)<br><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)<br><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | <input type="checkbox"/> Water-Stained Leaves (B9) ( <b>except MLRA 1, 2, 4A, and 4B</b> )<br><input type="checkbox"/> Salt Crust (B11)<br><input type="checkbox"/> Aquatic Invertebrates (B13)<br><input type="checkbox"/> Hydrogen Sulfide Odor (C1)<br><input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)<br><input type="checkbox"/> Presence of Reduced Iron (C4)<br><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)<br><input type="checkbox"/> Stunted or Stressed Plants (D1) ( <b>LRR A</b> )<br><input type="checkbox"/> Other (Explain in Remarks) |
|   | <input type="checkbox"/> Water-Stained Leaves (B9) ( <b>MLRA 1, 2, 4A, and 4B</b> )<br><input type="checkbox"/> Drainage Patterns (B10)<br><input type="checkbox"/> Dry-Season Water Table (C2)<br><input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)<br><input type="checkbox"/> Geomorphic Position (D2)<br><input type="checkbox"/> Shallow Aquitard (D3)<br><input type="checkbox"/> FAC-Neutral Test (D5)<br><input type="checkbox"/> Raised Ant Mounds (D6) ( <b>LRR A</b> )<br><input type="checkbox"/> Frost-Heave Hummocks (D7)  |

**Field Observations:**

|  |   |                          |   |
|--|---|--------------------------|---|
| Surface Water Present?   | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | Depth (inches): _____    | <b>Wetland Hydrology Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Water Table Present?   | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | Depth (inches): <u>6</u> |   |
| Saturation Present?<br>(includes capillary fringe)   | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | Depth (inches): <u>3</u> |   |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: |   |                          |   |

Remarks:  
Wetland hydrology criterion observed through A2 & A3 primary indicators during non-growing season at time of monitoring well installation on March 1, 2018. Monitoring well installed at monitoring location MP-10 indicated non-wetland hydrology. Monitoring well was observed weekly from March 6 to June 5, 2018.

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

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 03/01/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-11  
 Investigator(s): Emily Swaim, Richard Peel Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): None Slope (%): 2  
 Subregion (LRR): A-2 Lat: 48.137720 Long: -122.16583264 Datum: WGS 84  
 Soil Map Unit Name: Norma 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 , Soil , or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |  |
|---|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | <b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks: <b>Not all three wetland criteria observed, hydrophytic vegetation present; disked. Non-wetland hydrology confirmed by groundwater monitoring study.</b>   |  |

**VEGETATION – Use scientific names of plants.**

|   | Absolute % Cover | Dominant Species? | Indicator Status |  |
|---|------------------|-------------------|------------------|--|
| <b>Tree Stratum</b> (Plot size: <u>30 ft</u> )          |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| <b>Sapling/Shrub Stratum</b> (Plot size: <u>15 ft</u> ) |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
| 5. _____  | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| <b>Herb Stratum</b> (Plot size: <u>5 ft</u> )           |                  |                   |                  |  |
| 1. <u>Holcus lanatus</u>                                | <u>55</u>        | <u>Yes</u>        | <u>FAC</u>       |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
| 5. _____  | _____            | _____             | _____            |  |
| 6. _____  | _____            | _____             | _____            |  |
| 7. _____  | _____            | _____             | _____            |  |
| 8. _____  | _____            | _____             | _____            |  |
| 9. _____  | _____            | _____             | _____            |  |
| 10. _____   | _____            | _____             | _____            |  |
| 11. _____   | _____            | _____             | _____            |  |
|   | <u>55</u>        | = Total Cover     |                  |  |
| <b>Woody Vine Stratum</b> (Plot size: <u>30 ft</u> )    |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| <b>% Bare Ground in Herb Stratum</b> <u>45</u>          |                  |                   |                  |  |

**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 0 x 2 = 0  
 FAC species 55 x 3 = 165  
 FACU species 0 x 4 = 0  
 UPL species 0 x 5 = 0  
 Column Totals: 55 (A) 165 (B)  
 Prevalence Index = B/A = 3

**Hydrophytic Vegetation Indicators:**  
 Rapid Test for Hydrophytic Vegetation  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes  No

Remarks: **Hydrophytic vegetation criterion observed through dominance test indicator.**



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

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 03/01/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-12  
 Investigator(s): Richard Peel, Emily Swaim Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): Concave Slope (%): 0  
 Subregion (LRR): A-2 Lat: 48.138523 Long: -122.16593010 Datum: WGS 84  
 Soil Map Unit Name: Norma 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 , Soil , or Hydrology  significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology  naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |  |
|---|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | <b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks: <b>Not all three wetland criteria observed, only hydrophytic vegetation present. Non-wetland hydrology confirmed by groundwater monitoring study.</b>  |  |

### VEGETATION – Use scientific names of plants.

|   | Absolute % Cover | Dominant Species? | Indicator Status |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
|---|------------------|-------------------|------------------|--|-------------------|--------------|----------------------|----------------|-----------------------|----------------|-----------------------|------------------|-----------------------|----------------|----------------------|----------------|------------------------------|----------------|
| <b>Tree Stratum</b> (Plot size: <u>30 ft</u> )          |                  |                   |                  |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 1. _____  | _____            | _____             | _____            | <b>Dominance Test worksheet:</b><br>Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)<br><br>Total Number of Dominant Species Across All Strata: <u>1</u> (B)<br><br>Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)   |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 2. _____  | _____            | _____             | _____            |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 3. _____  | _____            | _____             | _____            |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 4. _____  | _____            | _____             | _____            |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| _____   | <u>0</u>         | = Total Cover     |                  |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| <b>Sapling/Shrub Stratum</b> (Plot size: <u>15 ft</u> ) |                  |                   |                  |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 1. _____  | _____            | _____             | _____            | <b>Prevalence Index worksheet:</b><br><table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">Total % Cover of:</td> <td style="text-align: center;">Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>0</u></td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species <u>75</u></td> <td>x 3 = <u>225</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>75</u> (A)</td> <td><u>225</u> (B)</td> </tr> </table><br>Prevalence Index = B/A = <u>3</u> | Total % Cover of: | Multiply by: | OBL species <u>0</u> | x 1 = <u>0</u> | FACW species <u>0</u> | x 2 = <u>0</u> | FAC species <u>75</u> | x 3 = <u>225</u> | FACU species <u>0</u> | x 4 = <u>0</u> | UPL species <u>0</u> | x 5 = <u>0</u> | Column Totals: <u>75</u> (A) | <u>225</u> (B) |
| Total % Cover of:                                       | Multiply by:     |                   |                  |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| OBL species <u>0</u>                                    | x 1 = <u>0</u>   |                   |                  |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| FACW species <u>0</u>                                   | x 2 = <u>0</u>   |                   |                  |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| FAC species <u>75</u>                                   | x 3 = <u>225</u> |                   |                  |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| FACU species <u>0</u>                                   | x 4 = <u>0</u>   |                   |                  |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| UPL species <u>0</u>                                    | x 5 = <u>0</u>   |                   |                  |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| Column Totals: <u>75</u> (A)                            | <u>225</u> (B)   |                   |                  |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 2. _____  | _____            | _____             | _____            |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 3. _____  | _____            | _____             | _____            |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 4. _____  | _____            | _____             | _____            |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 5. _____  | <u>0</u>         | = Total Cover     |                  |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| <b>Herb Stratum</b> (Plot size: <u>5 ft</u> )           |                  |                   |                  |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 1. <u>Holcus lanatus</u>                                | <u>75</u>        | <u>Yes</u>        | <u>FAC</u>       | <b>Hydrophytic Vegetation Indicators:</b><br><input type="checkbox"/> Rapid Test for Hydrophytic Vegetation<br><input checked="" type="checkbox"/> Dominance Test is >50%<br><input checked="" type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup><br><input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)<br><input type="checkbox"/> Wetland Non-Vascular Plants <sup>1</sup><br><input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)<br><br><sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.             |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 2. _____  | _____            | _____             | _____            |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 3. _____  | _____            | _____             | _____            |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 4. _____  | _____            | _____             | _____            |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 5. _____  | _____            | _____             | _____            |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 6. _____  | _____            | _____             | _____            |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 7. _____  | _____            | _____             | _____            |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 8. _____  | _____            | _____             | _____            |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 9. _____  | _____            | _____             | _____            |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 10. _____   | _____            | _____             | _____            |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 11. _____   | <u>75</u>        | = Total Cover     |                  |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| <b>Woody Vine Stratum</b> (Plot size: <u>30 ft</u> )    |                  |                   |                  |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 1. _____  | _____            | _____             | _____            | <b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>   |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 2. _____  | _____            | _____             | _____            |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| % Bare Ground in Herb Stratum <u>25</u>                 |                  |                   |                  |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |

Remarks: **Hydrophytic vegetation criterion observed through dominance test indicator.**



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

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 03/01/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-13  
 Investigator(s): Emily Swaim, Richard Peel Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): None Slope (%): 0  
 Subregion (LRR): A-2 Lat: 48.139679 Long: -122.16583105 Datum: WGS 84  
 Soil Map Unit Name: Custer fine 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 , Soil , or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |  |
|---|--|
| Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | <b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks:<br><p align="center"><b>No wetland criteria observed. Non-wetland hydrology confirmed by groundwater monitoring study.</b></p>   |  |

**VEGETATION – Use scientific names of plants.**

| <u>Tree Stratum</u> (Plot size: <u>30 ft</u> )          | <u>Absolute % Cover</u> | <u>Dominant Species?</u> | <u>Indicator Status</u> |                         |
|---|-------------------------|--------------------------|-------------------------|-------------------------|
| 1. _____  | _____                   | _____                    | _____                   |                         |
| 2. _____  | _____                   | _____                    | _____                   |                         |
| 3. _____  | _____                   | _____                    | _____                   |                         |
| 4. _____  | _____                   | _____                    | _____                   |                         |
|   |                         |                          |                         | <u>0</u> = Total Cover  |
| <u>Sapling/Shrub Stratum</u> (Plot size: <u>15 ft</u> ) |                         |                          |                         |                         |
| 1. _____  | _____                   | _____                    | _____                   |                         |
| 2. _____  | _____                   | _____                    | _____                   |                         |
| 3. _____  | _____                   | _____                    | _____                   |                         |
| 4. _____  | _____                   | _____                    | _____                   |                         |
| 5. _____  | _____                   | _____                    | _____                   |                         |
|   |                         |                          |                         | <u>0</u> = Total Cover  |
| <u>Herb Stratum</u> (Plot size: <u>5 ft</u> )           |                         |                          |                         |                         |
| 1. <u>Holcus lanatus</u>                                | <u>25</u>               | <u>Yes</u>               | <u>FAC</u>              |                         |
| 2. <u>Geranium molle</u>                                | <u>10</u>               | <u>Yes</u>               | <u>UPL</u>              |                         |
| 3. _____  | _____                   | _____                    | _____                   |                         |
| 4. _____  | _____                   | _____                    | _____                   |                         |
| 5. _____  | _____                   | _____                    | _____                   |                         |
| 6. _____  | _____                   | _____                    | _____                   |                         |
| 7. _____  | _____                   | _____                    | _____                   |                         |
| 8. _____  | _____                   | _____                    | _____                   |                         |
| 9. _____  | _____                   | _____                    | _____                   |                         |
| 10. _____   | _____                   | _____                    | _____                   |                         |
| 11. _____   | _____                   | _____                    | _____                   |                         |
|   |                         |                          |                         | <u>35</u> = Total Cover |
| <u>Woody Vine Stratum</u> (Plot size: <u>30 ft</u> )    |                         |                          |                         |                         |
| 1. _____  | _____                   | _____                    | _____                   |                         |
| 2. _____  | _____                   | _____                    | _____                   |                         |
|   |                         |                          |                         | <u>0</u> = Total Cover  |
| <u>% Bare Ground in Herb Stratum</u> <u>65</u>          |                         |                          |                         |                         |

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)  
 Total Number of Dominant Species Across All Strata: 2 (B)  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

**Prevalence Index worksheet:**  
 Total % Cover of: \_\_\_\_\_ Multiply by:  
 OBL species 0 x 1 = 0  
 FACW species 0 x 2 = 0  
 FAC species 25 x 3 = 75  
 FACU species 0 x 4 = 0  
 UPL species 10 x 5 = 50  
 Column Totals: 35 (A) 125 (B)  
 Prevalence Index = B/A = 3.57

**Hydrophytic Vegetation Indicators:**  
 Rapid Test for Hydrophytic Vegetation  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes  No

Remarks: No hydrophytic vegetation indicators observed.



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

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 03/01/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-14  
 Investigator(s): Emily Swaim, Richard Peel Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): Concave Slope (%): 0  
 Subregion (LRR): A-2 Lat: 48.139750 Long: -122.16685359 Datum: WGS 84  
 Soil Map Unit Name: Custer fine 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 , Soil , or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |   |
|---|---|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | <b>Is the Sampled Area<br/>within a Wetland?</b><br>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks: <b>Not all three wetland criteria observed, only hydrophytic vegetation present. Non-wetland hydrology confirmed by groundwater monitoring study.</b>  |   |

### VEGETATION – Use scientific names of plants.

|   | Absolute % Cover | Dominant Species? | Indicator Status |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
|---|------------------|-------------------|------------------|--|-------------------|--------------|----------------------|----------------|-----------------------|----------------|-----------------------|------------------|-----------------------|----------------|----------------------|----------------|------------------------------|----------------|
| <b>Tree Stratum</b> (Plot size: <u>30 ft</u> )          |                  |                   |                  |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 1. _____  | _____            | _____             | _____            | <b>Dominance Test worksheet:</b><br>Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)<br><br>Total Number of Dominant Species Across All Strata: <u>1</u> (B)<br><br>Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)   |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 2. _____  | _____            | _____             | _____            |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 3. _____  | _____            | _____             | _____            |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 4. _____  | _____            | _____             | _____            |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| _____   | <u>0</u>         | = Total Cover     |                  |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| <b>Sapling/Shrub Stratum</b> (Plot size: <u>15 ft</u> ) |                  |                   |                  |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 1. _____  | _____            | _____             | _____            | <b>Prevalence Index worksheet:</b><br><table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">Total % Cover of:</td> <td style="text-align: center;">Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>0</u></td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species <u>60</u></td> <td>x 3 = <u>180</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>60</u> (A)</td> <td><u>180</u> (B)</td> </tr> </table><br>Prevalence Index = B/A = <u>3</u> | Total % Cover of: | Multiply by: | OBL species <u>0</u> | x 1 = <u>0</u> | FACW species <u>0</u> | x 2 = <u>0</u> | FAC species <u>60</u> | x 3 = <u>180</u> | FACU species <u>0</u> | x 4 = <u>0</u> | UPL species <u>0</u> | x 5 = <u>0</u> | Column Totals: <u>60</u> (A) | <u>180</u> (B) |
| Total % Cover of:                                       | Multiply by:     |                   |                  |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| OBL species <u>0</u>                                    | x 1 = <u>0</u>   |                   |                  |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| FACW species <u>0</u>                                   | x 2 = <u>0</u>   |                   |                  |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| FAC species <u>60</u>                                   | x 3 = <u>180</u> |                   |                  |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| FACU species <u>0</u>                                   | x 4 = <u>0</u>   |                   |                  |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| UPL species <u>0</u>                                    | x 5 = <u>0</u>   |                   |                  |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| Column Totals: <u>60</u> (A)                            | <u>180</u> (B)   |                   |                  |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 2. _____  | _____            | _____             | _____            |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 3. _____  | _____            | _____             | _____            |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 4. _____  | _____            | _____             | _____            |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 5. _____  | _____            | _____             | _____            |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| _____   | <u>0</u>         | = Total Cover     |                  |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| <b>Herb Stratum</b> (Plot size: <u>5 ft</u> )           |                  |                   |                  |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 1. <u>Holcus lanatus</u>                                | <u>60</u>        | <u>Yes</u>        | <u>FAC</u>       |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 2. _____  | _____            | _____             | _____            |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 3. _____  | _____            | _____             | _____            |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 4. _____  | _____            | _____             | _____            |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 5. _____  | _____            | _____             | _____            |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 6. _____  | _____            | _____             | _____            |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 7. _____  | _____            | _____             | _____            |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 8. _____  | _____            | _____             | _____            |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 9. _____  | _____            | _____             | _____            |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 10. _____   | _____            | _____             | _____            |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 11. _____   | _____            | _____             | _____            |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| _____   | <u>60</u>        | = Total Cover     |                  |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| <b>Woody Vine Stratum</b> (Plot size: <u>30 ft</u> )    |                  |                   |                  |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 1. _____  | _____            | _____             | _____            | <b>Hydrophytic Vegetation Indicators:</b><br><input type="checkbox"/> Rapid Test for Hydrophytic Vegetation<br><input checked="" type="checkbox"/> Dominance Test is >50%<br><input checked="" type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup><br><input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)<br><input type="checkbox"/> Wetland Non-Vascular Plants <sup>1</sup><br><input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)<br><small><sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.</small>   |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| 2. _____  | _____            | _____             | _____            |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| _____   | <u>0</u>         | = Total Cover     |                  |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |
| <b>% Bare Ground in Herb Stratum</b> <u>40</u>          |                  |                   |                  |  |                   |              |                      |                |                       |                |                       |                  |                       |                |                      |                |                              |                |

Remarks: **Hydrophytic vegetation criterion observed through dominance test indicator.**

**SOIL**

Sampling Point: DP-14

| Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) |               |    |                |   |                   |                  |         |         |
|---|---------------|----|----------------|---|-------------------|------------------|---------|---------|
| Depth (inches)  | Matrix        |    | Redox Features |   |                   | Loc <sup>2</sup> | Texture | Remarks |
|   | Color (moist) | %  | Color (moist)  | % | Type <sup>1</sup> |                  |         |         |
| 0 - 15  | 10YR 3/2      | 99 | 7.5 yr 2.5/3   | 1 | CS                | M                | SaLo    |         |
| 15 - 30   | 10YR 3/4      | 98 | 10YR 3/6       | 2 | CS                | M                | Sand    |         |
|   |               |    |                |   |                   |                  |         |         |
|   |               |    |                |   |                   |                  |         |         |
|   |               |    |                |   |                   |                  |         |         |
|   |               |    |                |   |                   |                  |         |         |
|   |               |    |                |   |                   |                  |         |         |
|   |               |    |                |   |                   |                  |         |         |

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

|  |   |   |
|--|---|---|
| <b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b><br><input type="checkbox"/> Histosol (A1)<br><input type="checkbox"/> Histic Epipedon (A2)<br><input type="checkbox"/> Black Histic (A3)<br><input type="checkbox"/> Hydrogen Sulfide (A4)<br><input type="checkbox"/> Depleted Below Dark Surface (A11)<br><input type="checkbox"/> Thick Dark Surface (A12)<br><input type="checkbox"/> Sandy Mucky Mineral (S1)<br><input type="checkbox"/> Sandy Gleyed Matrix (S4) | <input type="checkbox"/> Sandy Redox (S5)<br><input type="checkbox"/> Stripped Matrix (S6)<br><input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)<br><input type="checkbox"/> Loamy Gleyed Matrix (F2)<br><input type="checkbox"/> Depleted Matrix (F3)<br><input type="checkbox"/> Redox Dark Surface (F6)<br><input type="checkbox"/> Depleted Dark Surface (F7)<br><input type="checkbox"/> Redox Depressions (F8) | <b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b><br><input type="checkbox"/> 2 cm Muck (A10)<br><input type="checkbox"/> Red Parent Material (TF2)<br><input type="checkbox"/> Very Shallow Dark Surface (TF12)<br><input type="checkbox"/> Other (Explain in Remarks) |
|--|---|---|

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

|  |   |
|--|---|
| <b>Restrictive Layer (if present):</b><br>Type: _____<br>Depth (inches): _____ | <b>Hydric Soil Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
|--|---|

Remarks:  
No hydric soils indicators observed.

**HYDROLOGY**

|   |   |  |  |
|---|---|--|--|
| <b>Wetland Hydrology Indicators:</b><br>Primary Indicators (minimum of one required; check all that apply)  |   | Secondary Indicators (2 or more required)  |  |
| <input type="checkbox"/> Surface Water (A1)<br><input checked="" type="checkbox"/> High Water Table (A2)<br><input checked="" type="checkbox"/> Saturation (A3)<br><input type="checkbox"/> Water Marks (B1)<br><input type="checkbox"/> Sediment Deposits (B2)<br><input type="checkbox"/> Drift Deposits (B3)<br><input type="checkbox"/> Algal Mat or Crust (B4)<br><input type="checkbox"/> Iron Deposits (B5)<br><input type="checkbox"/> Surface Soil Cracks (B6)<br><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)<br><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | <input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)<br><input type="checkbox"/> Salt Crust (B11)<br><input type="checkbox"/> Aquatic Invertebrates (B13)<br><input type="checkbox"/> Hydrogen Sulfide Odor (C1)<br><input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)<br><input type="checkbox"/> Presence of Reduced Iron (C4)<br><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)<br><input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)<br><input type="checkbox"/> Other (Explain in Remarks) | <input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)<br><input type="checkbox"/> Drainage Patterns (B10)<br><input type="checkbox"/> Dry-Season Water Table (C2)<br><input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)<br><input type="checkbox"/> Geomorphic Position (D2)<br><input type="checkbox"/> Shallow Aquitard (D3)<br><input type="checkbox"/> FAC-Neutral Test (D5)<br><input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)<br><input type="checkbox"/> Frost-Heave Hummocks (D7) |  |
| <b>Field Observations:</b><br>Surface Water Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____<br>Water Table Present?    Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>9</u><br>Saturation Present?    Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>6</u><br>(includes capillary fringe)   |   | <b>Wetland Hydrology Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>  |  |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:  |   |  |  |
| Remarks:<br>Wetland hydrology criterion observed through A2 & A3 primary indicators during non-growing season at time of monitoring well installation on March 1, 2018. Monitoring well installed at monitoring location MP-14 indicated non-wetland hydrology. Monitoring well was observed weekly from March 6 to June 5, 2018.   |   |  |  |

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

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 03/01/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-15  
 Investigator(s): Richard Peel, Emily Swaim Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): Concave Slope (%): 0  
 Subregion (LRR): A-2 Lat: 48.140784 Long: -122.16661705 Datum: WGS 84  
 Soil Map Unit Name: Custer fine 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 , Soil , or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |  |
|---|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | <b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks: <b>Not all three wetland criteria observed, hydrophytic vegetation present. Non-wetland hydrology confirmed by groundwater monitoring study.</b>   |  |

**VEGETATION – Use scientific names of plants.**

| <u>Tree Stratum</u> (Plot size: <u>30 ft</u> )          | <u>Absolute % Cover</u>  | <u>Dominant Species?</u> | <u>Indicator Status</u> |                         |
|---|--------------------------|--------------------------|-------------------------|-------------------------|
| 1. _____  | _____                    | _____                    | _____                   |                         |
| 2. _____  | _____                    | _____                    | _____                   |                         |
| 3. _____  | _____                    | _____                    | _____                   |                         |
| 4. _____  | _____                    | _____                    | _____                   |                         |
|   |                          |                          |                         | <u>0</u> = Total Cover  |
| <u>Sapling/Shrub Stratum</u> (Plot size: <u>15 ft</u> ) | 1. _____                 | _____                    | _____                   |                         |
| 2. _____  | _____                    | _____                    | _____                   |                         |
| 3. _____  | _____                    | _____                    | _____                   |                         |
| 4. _____  | _____                    | _____                    | _____                   |                         |
| 5. _____  | _____                    | _____                    | _____                   |                         |
|   |                          |                          |                         | <u>0</u> = Total Cover  |
| <u>Herb Stratum</u> (Plot size: <u>5 ft</u> )           | 1. <u>Holcus lanatus</u> | <u>90</u>                | <u>Yes</u>              | <u>FAC</u>              |
| 2. _____  | _____                    | _____                    | _____                   |                         |
| 3. _____  | _____                    | _____                    | _____                   |                         |
| 4. _____  | _____                    | _____                    | _____                   |                         |
| 5. _____  | _____                    | _____                    | _____                   |                         |
| 6. _____  | _____                    | _____                    | _____                   |                         |
| 7. _____  | _____                    | _____                    | _____                   |                         |
| 8. _____  | _____                    | _____                    | _____                   |                         |
| 9. _____  | _____                    | _____                    | _____                   |                         |
| 10. _____   | _____                    | _____                    | _____                   |                         |
| 11. _____   | _____                    | _____                    | _____                   |                         |
|   |                          |                          |                         | <u>90</u> = Total Cover |
| <u>Woody Vine Stratum</u> (Plot size: <u>30 ft</u> )    | 1. _____                 | _____                    | _____                   |                         |
| 2. _____  | _____                    | _____                    | _____                   |                         |
|   |                          |                          |                         | <u>0</u> = Total Cover  |
| % Bare Ground in Herb Stratum <u>10</u>                 |                          |                          |                         |                         |

**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 0 x 2 = 0  
 FAC species 90 x 3 = 270  
 FACU species 0 x 4 = 0  
 UPL species 0 x 5 = 0  
 Column Totals: 90 (A) 270 (B)  
 Prevalence Index = B/A = 3

**Hydrophytic Vegetation Indicators:**  
 Rapid Test for Hydrophytic Vegetation  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes  No

Remarks: **Hydrophytic vegetation criterion observed through dominance test indicator.**



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

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 03/01/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-16  
 Investigator(s): Richard Peel, Emily Swaim Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): Concave Slope (%): 0  
 Subregion (LRR): A-2 Lat: 48.140740 Long: -122.16578727 Datum: WGS 84  
 Soil Map Unit Name: Custer fine 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 , Soil , or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |  |
|---|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | <b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks: <b>Not all three wetland criteria observed, hydrophytic vegetation present. Non-wetland hydrology confirmed by groundwater monitoring study.</b>   |  |

### VEGETATION – Use scientific names of plants.

|   | Absolute % Cover | Dominant Species? | Indicator Status |  |
|---|------------------|-------------------|------------------|--|
| <b>Tree Stratum</b> (Plot size: <u>30 ft</u> )          |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| <b>Sapling/Shrub Stratum</b> (Plot size: <u>15 ft</u> ) |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
| 5. _____  | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| <b>Herb Stratum</b> (Plot size: <u>5 ft</u> )           |                  |                   |                  |  |
| 1. <u>Agrostis capillaris</u>                           | <u>30</u>        | <u>Yes</u>        | <u>FAC</u>       |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
| 5. _____  | _____            | _____             | _____            |  |
| 6. _____  | _____            | _____             | _____            |  |
| 7. _____  | _____            | _____             | _____            |  |
| 8. _____  | _____            | _____             | _____            |  |
| 9. _____  | _____            | _____             | _____            |  |
| 10. _____   | _____            | _____             | _____            |  |
| 11. _____   | _____            | _____             | _____            |  |
|   | <u>30</u>        | = Total Cover     |                  |  |
| <b>Woody Vine Stratum</b> (Plot size: <u>30 ft</u> )    |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| <b>% Bare Ground in Herb Stratum</b> <u>70</u>          |                  |                   |                  |  |

**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 0 x 2 = 0  
 FAC species 30 x 3 = 90  
 FACU species 0 x 4 = 0  
 UPL species 0 x 5 = 0  
 Column Totals: 30 (A) 90 (B)  
 Prevalence Index = B/A = 3

**Hydrophytic Vegetation Indicators:**  
 Rapid Test for Hydrophytic Vegetation  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes  No

Remarks: **Hydrophytic vegetation criterion observed through dominance test indicator.**



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

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 03/01/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-17  
 Investigator(s): Richard Peel, Emily Swaim Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): Concave Slope (%): 0  
 Subregion (LRR): A-2 Lat: 48.141518 Long: -122.16488202 Datum: WGS 84  
 Soil Map Unit Name: Custer fine 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 , Soil , or Hydrology  significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |  |
|---|--|
| Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | <b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks:<br><p align="center"><b>No wetland criteria observed. Non-wetland hydrology confirmed by groundwater monitoring study.</b></p>   |  |

**VEGETATION – Use scientific names of plants.**

|   | Absolute % Cover | Dominant Species? | Indicator Status |  |
|---|------------------|-------------------|------------------|--|
| <b>Tree Stratum</b> (Plot size: <u>30 ft</u> )          |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| <b>Sapling/Shrub Stratum</b> (Plot size: <u>15 ft</u> ) |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
| 5. _____  | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| <b>Herb Stratum</b> (Plot size: <u>5 ft</u> )           |                  |                   |                  |  |
| 1. <u>Geranium molle</u>                                | <u>20</u>        | <u>Yes</u>        | <u>UPL</u>       |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
| 5. _____  | _____            | _____             | _____            |  |
| 6. _____  | _____            | _____             | _____            |  |
| 7. _____  | _____            | _____             | _____            |  |
| 8. _____  | _____            | _____             | _____            |  |
| 9. _____  | _____            | _____             | _____            |  |
| 10. _____   | _____            | _____             | _____            |  |
| 11. _____   | _____            | _____             | _____            |  |
|   | <u>20</u>        | = Total Cover     |                  |  |
| <b>Woody Vine Stratum</b> (Plot size: <u>30 ft</u> )    |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| <b>% Bare Ground in Herb Stratum</b> <u>80</u>          |                  |                   |                  |  |

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)  
 Total Number of Dominant Species Across All Strata: 1 (B)  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

**Prevalence Index worksheet:**  
 Total % Cover of: \_\_\_\_\_ Multiply by:  
 OBL species 0 x 1 = 0  
 FACW species 0 x 2 = 0  
 FAC species 0 x 3 = 0  
 FACU species 0 x 4 = 0  
 UPL species 20 x 5 = 100  
 Column Totals: 20 (A) 100 (B)  
 Prevalence Index = B/A = 5

**Hydrophytic Vegetation Indicators:**  
 Rapid Test for Hydrophytic Vegetation  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes  No

Remarks: No hydrophytic vegetation indicators observed.



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

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 03/01/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-18  
 Investigator(s): Richard Peel, Emily Swaim Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): Concave Slope (%): 0  
 Subregion (LRR): A-2 Lat: 48.141868 Long: -122.16445431 Datum: WGS 84  
 Soil Map Unit Name: Custer fine 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 , Soil , or Hydrology  significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |  |
|---|--|
| Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | <b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks:<br><p align="center"><b>No wetland criteria observed. Non-wetland hydrology confirmed by groundwater monitoring study.</b></p>   |  |

**VEGETATION – Use scientific names of plants.**

| <u>Tree Stratum</u> (Plot size: <u>30 ft</u> )          | Absolute % Cover | Dominant Species? | Indicator Status |                        |
|---|------------------|-------------------|------------------|------------------------|
| 1. _____  | _____            | _____             | _____            |                        |
| 2. _____  | _____            | _____             | _____            |                        |
| 3. _____  | _____            | _____             | _____            |                        |
| 4. _____  | _____            | _____             | _____            |                        |
|   |                  |                   |                  | <u>0</u> = Total Cover |
| <u>Sapling/Shrub Stratum</u> (Plot size: <u>15 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |                        |
| 1. _____  | _____            | _____             | _____            |                        |
| 2. _____  | _____            | _____             | _____            |                        |
| 3. _____  | _____            | _____             | _____            |                        |
| 4. _____  | _____            | _____             | _____            |                        |
| 5. _____  | _____            | _____             | _____            |                        |
|   |                  |                   |                  | <u>0</u> = Total Cover |
| <u>Herb Stratum</u> (Plot size: <u>5 ft</u> )           | Absolute % Cover | Dominant Species? | Indicator Status |                        |
| 1. _____  | _____            | _____             | _____            |                        |
| 2. _____  | _____            | _____             | _____            |                        |
| 3. _____  | _____            | _____             | _____            |                        |
| 4. _____  | _____            | _____             | _____            |                        |
| 5. _____  | _____            | _____             | _____            |                        |
| 6. _____  | _____            | _____             | _____            |                        |
| 7. _____  | _____            | _____             | _____            |                        |
| 8. _____  | _____            | _____             | _____            |                        |
| 9. _____  | _____            | _____             | _____            |                        |
| 10. _____   | _____            | _____             | _____            |                        |
| 11. _____   | _____            | _____             | _____            |                        |
|   |                  |                   |                  | <u>0</u> = Total Cover |
| <u>Woody Vine Stratum</u> (Plot size: <u>30 ft</u> )    | Absolute % Cover | Dominant Species? | Indicator Status |                        |
| 1. _____  | _____            | _____             | _____            |                        |
| 2. _____  | _____            | _____             | _____            |                        |
|   |                  |                   |                  | <u>0</u> = Total Cover |
| % Bare Ground in Herb Stratum <u>100</u>                |                  |                   |                  |                        |

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)  
 Total Number of Dominant Species Across All Strata: 0 (B)  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

**Prevalence Index worksheet:**  
 Total % Cover of: \_\_\_\_\_ Multiply by:  
 OBL species 0 x 1 = 0  
 FACW species 0 x 2 = 0  
 FAC species 0 x 3 = 0  
 FACU species 0 x 4 = 0  
 UPL species 0 x 5 = 0  
 Column Totals: 0 (A) 0 (B)  
 Prevalence Index = B/A = \_\_\_\_\_

**Hydrophytic Vegetation Indicators:**  
 Rapid Test for Hydrophytic Vegetation  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes  No

Remarks: No hydrophytic vegetation indicators observed; there were no plants present, due to recent plowing.

**SOIL**

Sampling Point: DP-18

| <b>Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)</b> |               |    |                |   |                   |                  |         |         |
|--|---------------|----|----------------|---|-------------------|------------------|---------|---------|
| Depth<br>(inches)  | Matrix        |    | Redox Features |   |                   | Loc <sup>2</sup> | Texture | Remarks |
|  | Color (moist) | %  | Color (moist)  | % | Type <sup>1</sup> |                  |         |         |
| 0 - 22   | 10YR 3/2      | 98 | 10YR 3/6       | 2 | C                 | M, PL            | SaLo    |         |
| 22 - 30  | 5y 4/1        | 98 | 7.5yr 4/6      | 2 | CS                | M                | LoSa    |         |
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## WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 03/01/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-19  
 Investigator(s): Emily Swaim, Richard Peel Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): Concave Slope (%): 0  
 Subregion (LRR): A-2 Lat: 48.141867 Long: -122.16558453 Datum: WGS 84  
 Soil Map Unit Name: Custer fine 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 , Soil , or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |   |
|---|---|
| Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | <b>Is the Sampled Area<br/>within a Wetland?</b><br>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks:<br><p style="text-align: center; font-weight: bold;">No wetland criteria observed. Non-wetland hydrology confirmed by groundwater monitoring study.</p>  |   |

### VEGETATION – Use scientific names of plants.

| <u>Tree Stratum</u> (Plot size: <u>30 ft</u> )          | Absolute<br>% Cover | Dominant<br>Species? | Indicator<br>Status |                        |
|---|---------------------|----------------------|---------------------|------------------------|
| 1. _____  | _____               | _____                | _____               |                        |
| 2. _____  | _____               | _____                | _____               |                        |
| 3. _____  | _____               | _____                | _____               |                        |
| 4. _____  | _____               | _____                | _____               |                        |
|   |                     |                      |                     | <u>0</u> = Total Cover |
| <u>Sapling/Shrub Stratum</u> (Plot size: <u>15 ft</u> ) |                     |                      |                     |                        |
| 1. _____  | _____               | _____                | _____               |                        |
| 2. _____  | _____               | _____                | _____               |                        |
| 3. _____  | _____               | _____                | _____               |                        |
| 4. _____  | _____               | _____                | _____               |                        |
| 5. _____  | _____               | _____                | _____               |                        |
|   |                     |                      |                     | <u>0</u> = Total Cover |
| <u>Herb Stratum</u> (Plot size: <u>5 ft</u> )           |                     |                      |                     |                        |
| 1. _____  | _____               | _____                | _____               |                        |
| 2. _____  | _____               | _____                | _____               |                        |
| 3. _____  | _____               | _____                | _____               |                        |
| 4. _____  | _____               | _____                | _____               |                        |
| 5. _____  | _____               | _____                | _____               |                        |
| 6. _____  | _____               | _____                | _____               |                        |
| 7. _____  | _____               | _____                | _____               |                        |
| 8. _____  | _____               | _____                | _____               |                        |
| 9. _____  | _____               | _____                | _____               |                        |
| 10. _____   | _____               | _____                | _____               |                        |
| 11. _____   | _____               | _____                | _____               |                        |
|   |                     |                      |                     | <u>0</u> = Total Cover |
| <u>Woody Vine Stratum</u> (Plot size: <u>30 ft</u> )    |                     |                      |                     |                        |
| 1. _____  | _____               | _____                | _____               |                        |
| 2. _____  | _____               | _____                | _____               |                        |
|   |                     |                      |                     | <u>0</u> = Total Cover |
| % Bare Ground in Herb Stratum <u>100</u>                |                     |                      |                     |                        |

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)  
 Total Number of Dominant Species Across All Strata: 0 (B)  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

**Prevalence Index worksheet:**  
 Total % Cover of: \_\_\_\_\_ Multiply by:  
 OBL species 0 x 1 = 0  
 FACW species 0 x 2 = 0  
 FAC species 0 x 3 = 0  
 FACU species 0 x 4 = 0  
 UPL species 0 x 5 = 0  
 Column Totals: 0 (A) 0 (B)  
 Prevalence Index = B/A = \_\_\_\_\_

**Hydrophytic Vegetation Indicators:**  
 Rapid Test for Hydrophytic Vegetation  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes  No

Remarks: No hydrophytic vegetation indicators observed.



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

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 03/01/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-2  
 Investigator(s): Emily Swaim, Jon Pickett, Richard Peel Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): None Slope (%): 0  
 Subregion (LRR): A-2 Lat: 48.141819 Long: -122.163288 Datum: WGS 84  
 Soil Map Unit Name: Custer fine 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 , Soil , or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |  |
|---|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | <b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks: <b>Not all three wetland criteria observed; only hydrophytic vegetation and hydric soils present. Disked but typical. Non-wetland hydrology confirmed by groundwater monitoring study.</b>   |  |

**VEGETATION – Use scientific names of plants.**

| <u>Tree Stratum</u> (Plot size: <u>30 ft</u> )          | Absolute % Cover | Dominant Species? | Indicator Status |                         |
|---|------------------|-------------------|------------------|-------------------------|
| 1. _____  | _____            | _____             | _____            |                         |
| 2. _____  | _____            | _____             | _____            |                         |
| 3. _____  | _____            | _____             | _____            |                         |
| 4. _____  | _____            | _____             | _____            |                         |
|   |                  |                   |                  | <u>0</u> = Total Cover  |
| <u>Sapling/Shrub Stratum</u> (Plot size: <u>15 ft</u> ) |                  |                   |                  |                         |
| 1. _____  | _____            | _____             | _____            |                         |
| 2. _____  | _____            | _____             | _____            |                         |
| 3. _____  | _____            | _____             | _____            |                         |
| 4. _____  | _____            | _____             | _____            |                         |
| 5. _____  | _____            | _____             | _____            |                         |
|   |                  |                   |                  | <u>0</u> = Total Cover  |
| <u>Herb Stratum</u> (Plot size: <u>5 ft</u> )           |                  |                   |                  |                         |
| 1. <u>Viola glabella</u>                                | <u>15</u>        | <u>Yes</u>        | <u>FACW</u>      |                         |
| 2. <u>Clover sp</u>                                     | <u>5</u>         | <u>Yes</u>        | <u>FAC</u>       |                         |
| 3. <u>Agrostis capillaris</u>                           | <u>3</u>         | <u>No</u>         | <u>FAC</u>       |                         |
| 4. _____  | _____            | _____             | _____            |                         |
| 5. _____  | _____            | _____             | _____            |                         |
| 6. _____  | _____            | _____             | _____            |                         |
| 7. _____  | _____            | _____             | _____            |                         |
| 8. _____  | _____            | _____             | _____            |                         |
| 9. _____  | _____            | _____             | _____            |                         |
| 10. _____   | _____            | _____             | _____            |                         |
| 11. _____   | _____            | _____             | _____            |                         |
|   |                  |                   |                  | <u>23</u> = Total Cover |
| <u>Woody Vine Stratum</u> (Plot size: <u>30 ft</u> )    |                  |                   |                  |                         |
| 1. _____  | _____            | _____             | _____            |                         |
| 2. _____  | _____            | _____             | _____            |                         |
|   |                  |                   |                  | <u>0</u> = Total Cover  |
| % Bare Ground in Herb Stratum <u>77</u>                 |                  |                   |                  |                         |

**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:**  
 Rapid Test for Hydrophytic Vegetation  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes  No

Remarks: **Hydrophytic vegetation criterion observed through dominance test indicator.**

**SOIL**

Sampling Point: DP-2

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

| Depth (inches) | Matrix        |    | Redox Features |   |                   | Loc <sup>2</sup> | Texture | Remarks             |
|----------------|---------------|----|----------------|---|-------------------|------------------|---------|---------------------|
|                | Color (moist) | %  | Color (moist)  | % | Type <sup>1</sup> |                  |         |                     |
| 0 - 11         | 10YR3/2       | 98 | 10YR3/3        | 2 | CS                | M                | SaLo    | Very sandy gravelly |
| 11 - 33        | 10Y 4/1       | 95 | 7.5YR 4/6      | 5 | CS                | M                | Sand    | Coarse              |
|                |               |    |                |   |                   |                  |         |                     |
|                |               |    |                |   |                   |                  |         |                     |
|                |               |    |                |   |                   |                  |         |                     |
|                |               |    |                |   |                   |                  |         |                     |
|                |               |    |                |   |                   |                  |         |                     |

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

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

|   |  |   |
|---|--|---|
| <input type="checkbox"/> Histosol (A1)                                | <input type="checkbox"/> Sandy Redox (S5)                                  | <b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b> |
| <input type="checkbox"/> Histic Epipedon (A2)                         | <input type="checkbox"/> Stripped Matrix (S6)                              |   |
| <input type="checkbox"/> Black Histic (A3)                            | <input type="checkbox"/> Loamy Mucky Mineral (F1) ( <b>except MLRA 1</b> ) |   |
| <input type="checkbox"/> Hydrogen Sulfide (A4)                        | <input type="checkbox"/> Loamy Gleyed Matrix (F2)                          |   |
| <input checked="" type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Depleted Matrix (F3)                              |   |
| <input type="checkbox"/> Thick Dark Surface (A12)                     | <input type="checkbox"/> Redox Dark Surface (F6)                           |   |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)                     | <input type="checkbox"/> Depleted Dark Surface (F7)                        |   |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4)                     | <input type="checkbox"/> Redox Depressions (F8)                            |   |

<sup>3</sup>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:  
 Hydric soil criterion observed through A11 indicator.

**HYDROLOGY**

**Wetland Hydrology Indicators:**

|   |   |
|---|---|
| <b>Primary Indicators (minimum of one required; check all that apply)</b>   | <b>Secondary Indicators (2 or more required)</b>  |
| <input type="checkbox"/> Surface Water (A1)<br><input checked="" type="checkbox"/> High Water Table (A2)<br><input checked="" type="checkbox"/> Saturation (A3)<br><input type="checkbox"/> Water Marks (B1)<br><input type="checkbox"/> Sediment Deposits (B2)<br><input type="checkbox"/> Drift Deposits (B3)<br><input type="checkbox"/> Algal Mat or Crust (B4)<br><input type="checkbox"/> Iron Deposits (B5)<br><input type="checkbox"/> Surface Soil Cracks (B6)<br><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)<br><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | <input type="checkbox"/> Water-Stained Leaves (B9) ( <b>except MLRA 1, 2, 4A, and 4B</b> )<br><input type="checkbox"/> Salt Crust (B11)<br><input type="checkbox"/> Aquatic Invertebrates (B13)<br><input type="checkbox"/> Hydrogen Sulfide Odor (C1)<br><input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)<br><input type="checkbox"/> Presence of Reduced Iron (C4)<br><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)<br><input type="checkbox"/> Stunted or Stressed Plants (D1) ( <b>LRR A</b> )<br><input type="checkbox"/> Other (Explain in Remarks) |
|   | <input type="checkbox"/> Water-Stained Leaves (B9) ( <b>MLRA 1, 2, 4A, and 4B</b> )<br><input type="checkbox"/> Drainage Patterns (B10)<br><input type="checkbox"/> Dry-Season Water Table (C2)<br><input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)<br><input type="checkbox"/> Geomorphic Position (D2)<br><input type="checkbox"/> Shallow Aquitard (D3)<br><input type="checkbox"/> FAC-Neutral Test (D5)<br><input type="checkbox"/> Raised Ant Mounds (D6) ( <b>LRR A</b> )<br><input type="checkbox"/> Frost-Heave Hummocks (D7)  |

**Field Observations:**

|  |   |                          |   |
|--|---|--------------------------|---|
| Surface Water Present?                             | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | Depth (inches): _____    | <b>Wetland Hydrology Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Water Table Present?                               | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | Depth (inches): <u>9</u> |   |
| Saturation Present?<br>(includes capillary fringe) | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | Depth (inches): <u>6</u> |   |

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

Remarks:  
 Wetland hydrology criteria observed through A2 & A3 primary indicators during non-growing season at time of monitoring well installation on March 1, 2018. Monitoring well installed at monitoring location MP-2 indicated non-wetland hydrology. Monitoring well was observed weekly from March 6 to June 5, 2018.

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

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 03/01/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-20  
 Investigator(s): Richard Peel, Emily Swaim Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley floor Local relief (concave, convex, none): Concave Slope (%): 0  
 Subregion (LRR): A-2 Lat: 48.141619 Long: -122.16665014 Datum: WGS 84  
 Soil Map Unit Name: Custer fine 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 , Soil , or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |  |
|---|--|
| Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | <b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks: <u>Not all three wetland criteria observed, only hydric soil present. Non-wetland hydrology confirmed by groundwater monitoring study.</u>   |  |

### VEGETATION – Use scientific names of plants.

|   | Absolute % Cover | Dominant Species? | Indicator Status |  |
|---|------------------|-------------------|------------------|--|
| <b>Tree Stratum</b> (Plot size: <u>30 ft</u> )          |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| <b>Sapling/Shrub Stratum</b> (Plot size: <u>15 ft</u> ) |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
| 5. _____  | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| <b>Herb Stratum</b> (Plot size: <u>5 ft</u> )           |                  |                   |                  |  |
| 1. <u>Trifolium pratense</u>                            | <u>20</u>        | <u>Yes</u>        | <u>FACU</u>      |  |
| 2. <u>Geranium molle</u>                                | <u>10</u>        | <u>Yes</u>        | <u>UPL</u>       |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
| 5. _____  | _____            | _____             | _____            |  |
| 6. _____  | _____            | _____             | _____            |  |
| 7. _____  | _____            | _____             | _____            |  |
| 8. _____  | _____            | _____             | _____            |  |
| 9. _____  | _____            | _____             | _____            |  |
| 10. _____   | _____            | _____             | _____            |  |
| 11. _____   | _____            | _____             | _____            |  |
|   | <u>30</u>        | = Total Cover     |                  |  |
| <b>Woody Vine Stratum</b> (Plot size: <u>30 ft</u> )    |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| <b>% Bare Ground in Herb Stratum</b> <u>70</u>          |                  |                   |                  |  |

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)  
 Total Number of Dominant Species Across All Strata: 2 (B)  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

**Prevalence Index worksheet:**  
 Total % Cover of: \_\_\_\_\_ Multiply by: \_\_\_\_\_  
 OBL species 0 x 1 = 0  
 FACW species 0 x 2 = 0  
 FAC species 0 x 3 = 0  
 FACU species 20 x 4 = 80  
 UPL species 10 x 5 = 50  
 Column Totals: 30 (A) 130 (B)  
 Prevalence Index = B/A = 4.33

**Hydrophytic Vegetation Indicators:**  
 Rapid Test for Hydrophytic Vegetation  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes  No

Remarks: No hydrophytic vegetation indicators observed.

**SOIL**

Sampling Point: DP-20

| <b>Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)</b>                             |               |     |  |    |                   |   |         |         |
|--|---------------|-----|--|----|-------------------|---|---------|---------|
| Depth<br>(inches)  | Matrix        |     | Redox Features   |    |                   | Loc <sup>2</sup>  | Texture | Remarks |
|  | Color (moist) | %   | Color (moist)  | %  | Type <sup>1</sup> |   |         |         |
| 0 - 11   | 10YR 3/2      | 100 |  |    |                   |   | SaLo    |         |
| 11 - 20  | 5y 4/1        | 98  | 7.5 yr 4/6   | 2  | CS                | M   | LoSa    |         |
| 20 - 24  | 10Y 6/1       | 93  | 7.5yr 4/6  | 7  | C                 | M   | SiCILo  |         |
| 24 - 30  | 5y 4/2        | 90  | 7.5yr 4/6  | 10 | CS                | M   | LoSa    |         |
|  |               |     |  |    |                   |   |         |         |
|  |               |     |  |    |                   |   |         |         |
|  |               |     |  |    |                   |   |         |         |
| <sup>1</sup> Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup> Location: PL=Pore Lining, M=Matrix. |               |     |  |    |                   |   |         |         |
| <b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b>   |               |     |  |    |                   | <b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b>   |         |         |
| <input type="checkbox"/> Histosol (A1)   |               |     | <input type="checkbox"/> Sandy Redox (S5)                                  |    |                   | <input type="checkbox"/> 2 cm Muck (A10)  |         |         |
| <input type="checkbox"/> Histic Epipedon (A2)  |               |     | <input type="checkbox"/> Stripped Matrix (S6)                              |    |                   | <input type="checkbox"/> Red Parent Material (TF2)  |         |         |
| <input type="checkbox"/> Black Histic (A3)   |               |     | <input type="checkbox"/> Loamy Mucky Mineral (F1) ( <b>except MLRA 1</b> ) |    |                   | <input type="checkbox"/> Very Shallow Dark Surface (TF12)   |         |         |
| <input type="checkbox"/> Hydrogen Sulfide (A4)   |               |     | <input type="checkbox"/> Loamy Gleyed Matrix (F2)                          |    |                   | <input type="checkbox"/> Other (Explain in Remarks)   |         |         |
| <input checked="" type="checkbox"/> Depleted Below Dark Surface (A11)  |               |     | <input type="checkbox"/> Depleted Matrix (F3)                              |    |                   | <sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. |         |         |
| <input type="checkbox"/> Thick Dark Surface (A12)  |               |     | <input type="checkbox"/> Redox Dark Surface (F6)                           |    |                   |   |         |         |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)  |               |     | <input type="checkbox"/> Depleted Dark Surface (F7)                        |    |                   |   |         |         |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4)  |               |     | <input type="checkbox"/> Redox Depressions (F8)                            |    |                   |   |         |         |
| <b>Restrictive Layer (if present):</b>   |               |     |  |    |                   | <b>Hydric Soil Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>                           |         |         |
| Type: _____  |               |     |  |    |                   |   |         |         |
| Depth (inches): _____  |               |     |  |    |                   |   |         |         |
| Remarks:<br>Hydric soil criterion observed through A11 indicator.  |               |     |  |    |                   |   |         |         |

**HYDROLOGY**

| <b>Wetland Hydrology Indicators:</b>  |  |   |  |
|---|--|---|--|
| Primary Indicators (minimum of one required; check all that apply)  |  | Secondary Indicators (2 or more required)   |  |
| <input type="checkbox"/> Surface Water (A1)   | <input type="checkbox"/> Water-Stained Leaves (B9) ( <b>except MLRA 1, 2, 4A, and 4B</b> ) | <input type="checkbox"/> Water-Stained Leaves (B9) ( <b>MLRA 1, 2, 4A, and 4B</b> )                   |  |
| <input checked="" type="checkbox"/> High Water Table (A2)   | <input type="checkbox"/> Salt Crust (B11)  | <input type="checkbox"/> Drainage Patterns (B10)  |  |
| <input checked="" type="checkbox"/> Saturation (A3)   | <input type="checkbox"/> Aquatic Invertebrates (B13)                                       | <input type="checkbox"/> Dry-Season Water Table (C2)  |  |
| <input type="checkbox"/> Water Marks (B1)   | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)  | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)                                    |  |
| <input type="checkbox"/> Sediment Deposits (B2)   | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)                     | <input type="checkbox"/> Geomorphic Position (D2)   |  |
| <input type="checkbox"/> Drift Deposits (B3)  | <input type="checkbox"/> Presence of Reduced Iron (C4)                                     | <input type="checkbox"/> Shallow Aquitard (D3)  |  |
| <input type="checkbox"/> Algal Mat or Crust (B4)  | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)                        | <input type="checkbox"/> FAC-Neutral Test (D5)  |  |
| <input type="checkbox"/> Iron Deposits (B5)   | <input type="checkbox"/> Stunted or Stressed Plants (D1) ( <b>LRR A</b> )                  | <input type="checkbox"/> Raised Ant Mounds (D6) ( <b>LRR A</b> )                                      |  |
| <input type="checkbox"/> Surface Soil Cracks (B6)   | <input type="checkbox"/> Other (Explain in Remarks)  | <input type="checkbox"/> Frost-Heave Hummocks (D7)  |  |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)  |  |   |  |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)  |  |   |  |
| <b>Field Observations:</b>  |  | <b>Wetland Hydrology Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |  |
| Surface Water Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>   | Depth (inches): _____  |   |  |
| Water Table Present?    Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>   | Depth (inches): <u>12</u>  |   |  |
| Saturation Present?    Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>  | Depth (inches): <u>7</u>   |   |  |
| (includes capillary fringe)   |  |   |  |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:  |  |   |  |
| Remarks:<br>Wetland hydrology criterion observed through A2 & A3 primary indicators during non-growing season at time of monitoring well installation on March 1, 2018. Monitoring well installed at monitoring location MP-20 indicated non-wetland hydrology. Monitoring well was observed weekly from March 6 to June 5, 2018. |  |   |  |

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

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 03/02/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-21  
 Investigator(s): Emily Swaim, Richard Peel Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): None Slope (%): 0  
 Subregion (LRR): A-2 Lat: 48.143714 Long: -122.16307578 Datum: WGS 84  
 Soil Map Unit Name: Custer fine 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 , Soil , or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |  |
|---|--|
| Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | <b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks:<br><p align="center"><b>No wetland criteria observed; disked. Non-wetland hydrology confirmed by groundwater monitoring study.</b></p>   |  |

**VEGETATION – Use scientific names of plants.**

| <u>Tree Stratum</u> (Plot size: <u>30 ft</u> )          | Absolute % Cover | Dominant Species? | Indicator Status |                        |
|---|------------------|-------------------|------------------|------------------------|
| 1. _____  | _____            | _____             | _____            |                        |
| 2. _____  | _____            | _____             | _____            |                        |
| 3. _____  | _____            | _____             | _____            |                        |
| 4. _____  | _____            | _____             | _____            |                        |
|   |                  |                   |                  | <u>0</u> = Total Cover |
| <u>Sapling/Shrub Stratum</u> (Plot size: <u>15 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |                        |
| 1. _____  | _____            | _____             | _____            |                        |
| 2. _____  | _____            | _____             | _____            |                        |
| 3. _____  | _____            | _____             | _____            |                        |
| 4. _____  | _____            | _____             | _____            |                        |
| 5. _____  | _____            | _____             | _____            |                        |
|   |                  |                   |                  | <u>0</u> = Total Cover |
| <u>Herb Stratum</u> (Plot size: <u>5 ft</u> )           | Absolute % Cover | Dominant Species? | Indicator Status |                        |
| 1. <u>Festuca idahoensis</u>                            | <u>5</u>         | <u>Yes</u>        | <u>FACU</u>      |                        |
| 2. _____  | _____            | _____             | _____            |                        |
| 3. _____  | _____            | _____             | _____            |                        |
| 4. _____  | _____            | _____             | _____            |                        |
| 5. _____  | _____            | _____             | _____            |                        |
| 6. _____  | _____            | _____             | _____            |                        |
| 7. _____  | _____            | _____             | _____            |                        |
| 8. _____  | _____            | _____             | _____            |                        |
| 9. _____  | _____            | _____             | _____            |                        |
| 10. _____   | _____            | _____             | _____            |                        |
| 11. _____   | _____            | _____             | _____            |                        |
|   |                  |                   |                  | <u>5</u> = Total Cover |
| <u>Woody Vine Stratum</u> (Plot size: <u>30 ft</u> )    | Absolute % Cover | Dominant Species? | Indicator Status |                        |
| 1. _____  | _____            | _____             | _____            |                        |
| 2. _____  | _____            | _____             | _____            |                        |
|   |                  |                   |                  | <u>0</u> = Total Cover |
| % Bare Ground in Herb Stratum <u>95</u>                 |                  |                   |                  |                        |

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)  
 Total Number of Dominant Species Across All Strata: 1 (B)  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

**Prevalence Index worksheet:**  
 Total % Cover of: \_\_\_\_\_ Multiply by:  
 OBL species 0 x 1 = 0  
 FACW species 0 x 2 = 0  
 FAC species 0 x 3 = 0  
 FACU species 5 x 4 = 20  
 UPL species 0 x 5 = 0  
 Column Totals: 5 (A) 20 (B)  
 Prevalence Index = B/A = 4

**Hydrophytic Vegetation Indicators:**  
 Rapid Test for Hydrophytic Vegetation  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes  No

Remarks: **No hydrophytic vegetation indicators observed.**



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

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 03/02/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-22  
 Investigator(s): Richard Peel, Emily Swaim Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): Concave Slope (%): 0  
 Subregion (LRR): A-2 Lat: 48.143741 Long: -122.16417046 Datum: WGS 84  
 Soil Map Unit Name: Custer fine 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 , Soil , or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |  |
|---|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | <b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks: <b>Not all three wetland criteria observed, only hydrophytic vegetation present. Non-wetland hydrology confirmed by groundwater monitoring study.</b>  |  |

**VEGETATION – Use scientific names of plants.**

|   | Absolute % Cover | Dominant Species? | Indicator Status |  |
|---|------------------|-------------------|------------------|--|
| <b>Tree Stratum</b> (Plot size: <u>30 ft</u> )          |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| <b>Sapling/Shrub Stratum</b> (Plot size: <u>15 ft</u> ) |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
| 5. _____  | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| <b>Herb Stratum</b> (Plot size: <u>5 ft</u> )           |                  |                   |                  |  |
| 1. <u>Fescue</u>  | <u>10</u>        | <u>Yes</u>        | <u>FAC</u>       |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
| 5. _____  | _____            | _____             | _____            |  |
| 6. _____  | _____            | _____             | _____            |  |
| 7. _____  | _____            | _____             | _____            |  |
| 8. _____  | _____            | _____             | _____            |  |
| 9. _____  | _____            | _____             | _____            |  |
| 10. _____   | _____            | _____             | _____            |  |
| 11. _____   | _____            | _____             | _____            |  |
|   | <u>10</u>        | = Total Cover     |                  |  |
| <b>Woody Vine Stratum</b> (Plot size: <u>30 ft</u> )    |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| <b>% Bare Ground in Herb Stratum</b> <u>90</u>          |                  |                   |                  |  |

**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 0 x 2 = 0  
 FAC species 10 x 3 = 30  
 FACU species 0 x 4 = 0  
 UPL species 0 x 5 = 0  
 Column Totals: 10 (A) 30 (B)  
 Prevalence Index = B/A = 3

**Hydrophytic Vegetation Indicators:**  
 Rapid Test for Hydrophytic Vegetation  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes  No

Remarks: **Hydrophytic vegetation criterion observed through dominance test indicator.**



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

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 03/02/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-23  
 Investigator(s): Richard Peel, Emily Swaim Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): Concave Slope (%): 0  
 Subregion (LRR): A-2 Lat: 48.143748 Long: -122.16563707 Datum: WGS 84  
 Soil Map Unit Name: Norma 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 , Soil , or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |   |
|---|---|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | <b>Is the Sampled Area within a Wetland?</b><br>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks: <b>Not all three wetland criteria observed, only hydrophytic vegetation present. Non-wetland hydrology confirmed by groundwater monitoring study.</b>  |   |

**VEGETATION – Use scientific names of plants.**

| <u>Tree Stratum</u> (Plot size: <u>30 ft</u> )          | <u>Absolute % Cover</u> | <u>Dominant Species?</u> | <u>Indicator Status</u> | <b>Dominance Test worksheet:</b>   |
|---|-------------------------|--------------------------|-------------------------|--|
| 1. _____  | _____                   | _____                    | _____                   | Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)<br><br>Total Number of Dominant Species Across All Strata: <u>1</u> (B)<br><br>Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)   |
| 2. _____  | _____                   | _____                    | _____                   |  |
| 3. _____  | _____                   | _____                    | _____                   |  |
| 4. _____  | _____                   | _____                    | _____                   |  |
| <u>0</u> = Total Cover                                  |                         |                          |                         |  |
| <u>Sapling/Shrub Stratum</u> (Plot size: <u>15 ft</u> ) |                         |                          |                         | <b>Prevalence Index worksheet:</b><br>Total % Cover of: _____ Multiply by:<br>OBL species <u>0</u> x 1 = <u>0</u><br>FACW species <u>0</u> x 2 = <u>0</u><br>FAC species <u>10</u> x 3 = <u>30</u><br>FACU species <u>0</u> x 4 = <u>0</u><br>UPL species <u>0</u> x 5 = <u>0</u><br>Column Totals: <u>10</u> (A) <u>30</u> (B)<br><br>Prevalence Index = B/A = <u>3</u>   |
| 1. _____  | _____                   | _____                    | _____                   |  |
| 2. _____  | _____                   | _____                    | _____                   |  |
| 3. _____  | _____                   | _____                    | _____                   |  |
| 4. _____  | _____                   | _____                    | _____                   |  |
| 5. _____  | _____                   | _____                    | _____                   |  |
| <u>0</u> = Total Cover                                  |                         |                          |                         |  |
| <u>Herb Stratum</u> (Plot size: <u>5 ft</u> )           |                         |                          |                         | <b>Hydrophytic Vegetation Indicators:</b><br><input type="checkbox"/> Rapid Test for Hydrophytic Vegetation<br><input checked="" type="checkbox"/> Dominance Test is >50%<br><input checked="" type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup><br><input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)<br><input type="checkbox"/> Wetland Non-Vascular Plants <sup>1</sup><br><input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)<br><br><sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. |
| 1. <u>Fescue</u>  | <u>10</u>               | <u>Yes</u>               | <u>FAC</u>              |  |
| 2. _____  | _____                   | _____                    | _____                   |  |
| 3. _____  | _____                   | _____                    | _____                   |  |
| 4. _____  | _____                   | _____                    | _____                   |  |
| 5. _____  | _____                   | _____                    | _____                   |  |
| 6. _____  | _____                   | _____                    | _____                   |  |
| 7. _____  | _____                   | _____                    | _____                   |  |
| 8. _____  | _____                   | _____                    | _____                   |  |
| 9. _____  | _____                   | _____                    | _____                   |  |
| 10. _____   | _____                   | _____                    | _____                   |  |
| 11. _____   | _____                   | _____                    | _____                   |  |
| <u>10</u> = Total Cover                                 |                         |                          |                         |  |
| <u>Woody Vine Stratum</u> (Plot size: <u>30 ft</u> )    |                         |                          |                         | <b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>   |
| 1. _____  | _____                   | _____                    | _____                   |  |
| 2. _____  | _____                   | _____                    | _____                   |  |
| <u>0</u> = Total Cover                                  |                         |                          |                         |  |
| % Bare Ground in Herb Stratum <u>90</u>                 |                         |                          |                         |  |

Remarks: **Hydrophytic vegetation criterion observed through dominance test indicator; \*Unidentified grass species assumed to be facultative for scoring purposes.**

**SOIL**

Sampling Point: DP-23

| Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) |               |    |                |   |                   |                  |         |         |  |
|---|---------------|----|----------------|---|-------------------|------------------|---------|---------|--|
| Depth (inches)  | Matrix        |    | Redox Features |   |                   | Loc <sup>2</sup> | Texture | Remarks |  |
|   | Color (moist) | %  | Color (moist)  | % | Type <sup>1</sup> |                  |         |         |  |
| 0 - 4   | 10YR 3/3      | 99 | 10YR 3/6       | 1 | C                 | PL               | SaLo    |         |  |
| 4 - 16  | 5y 3/2        | 99 | 5yr 4/6        | 1 | CS                | PL               | Sand    | Coarse  |  |
| 16 - 24   | 5gy 4/1       | 97 | 2.5yr 3/6      | 3 | CS                | PL, M            | Sand    | Coarse  |  |
| 24 - 30   | 10Y 4/1       | 98 | 7.5yr 3/2      | 2 | CS                | PL, M            | Sand    | Coarse  |  |
|   |               |    |                |   |                   |                  |         |         |  |
|   |               |    |                |   |                   |                  |         |         |  |
|   |               |    |                |   |                   |                  |         |         |  |
|   |               |    |                |   |                   |                  |         |         |  |

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

|  |   |   |
|--|---|---|
| <b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b><br><input type="checkbox"/> Histosol (A1)<br><input type="checkbox"/> Histic Epipedon (A2)<br><input type="checkbox"/> Black Histic (A3)<br><input type="checkbox"/> Hydrogen Sulfide (A4)<br><input type="checkbox"/> Depleted Below Dark Surface (A11)<br><input type="checkbox"/> Thick Dark Surface (A12)<br><input type="checkbox"/> Sandy Mucky Mineral (S1)<br><input type="checkbox"/> Sandy Gleyed Matrix (S4) | <input type="checkbox"/> Sandy Redox (S5)<br><input type="checkbox"/> Stripped Matrix (S6)<br><input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)<br><input type="checkbox"/> Loamy Gleyed Matrix (F2)<br><input type="checkbox"/> Depleted Matrix (F3)<br><input type="checkbox"/> Redox Dark Surface (F6)<br><input type="checkbox"/> Depleted Dark Surface (F7)<br><input type="checkbox"/> Redox Depressions (F8) | <b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b><br><input type="checkbox"/> 2 cm Muck (A10)<br><input type="checkbox"/> Red Parent Material (TF2)<br><input type="checkbox"/> Very Shallow Dark Surface (TF12)<br><input type="checkbox"/> Other (Explain in Remarks) |
|--|---|---|

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

|  |   |
|--|---|
| <b>Restrictive Layer (if present):</b><br>Type: _____<br>Depth (inches): _____ | <b>Hydric Soil Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
|--|---|

Remarks:  
No hydric soils indicators observed.

**HYDROLOGY**

|   |   |  |  |
|---|---|--|--|
| <b>Wetland Hydrology Indicators:</b><br>Primary Indicators (minimum of one required; check all that apply)  |   | Secondary Indicators (2 or more required)  |  |
| <input type="checkbox"/> Surface Water (A1)<br><input type="checkbox"/> High Water Table (A2)<br><input type="checkbox"/> Saturation (A3)<br><input type="checkbox"/> Water Marks (B1)<br><input type="checkbox"/> Sediment Deposits (B2)<br><input type="checkbox"/> Drift Deposits (B3)<br><input type="checkbox"/> Algal Mat or Crust (B4)<br><input type="checkbox"/> Iron Deposits (B5)<br><input type="checkbox"/> Surface Soil Cracks (B6)<br><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)<br><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | <input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)<br><input type="checkbox"/> Salt Crust (B11)<br><input type="checkbox"/> Aquatic Invertebrates (B13)<br><input type="checkbox"/> Hydrogen Sulfide Odor (C1)<br><input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)<br><input type="checkbox"/> Presence of Reduced Iron (C4)<br><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)<br><input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)<br><input type="checkbox"/> Other (Explain in Remarks) | <input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)<br><input type="checkbox"/> Drainage Patterns (B10)<br><input type="checkbox"/> Dry-Season Water Table (C2)<br><input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)<br><input type="checkbox"/> Geomorphic Position (D2)<br><input type="checkbox"/> Shallow Aquitard (D3)<br><input type="checkbox"/> FAC-Neutral Test (D5)<br><input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)<br><input type="checkbox"/> Frost-Heave Hummocks (D7) |  |
| <b>Field Observations:</b><br>Surface Water Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____<br>Water Table Present?    Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>24</u><br>Saturation Present?    Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>19</u><br>(includes capillary fringe)   |   | <b>Wetland Hydrology Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>  |  |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:  |   |  |  |
| Remarks:<br>No wetland hydrology indicators observed. Monitoring well installed at monitoring location MP-23 indicated non-wetland hydrology. Monitoring well was observed weekly from March 6 to June 5, 2018.   |   |  |  |

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

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 03/02/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-24  
 Investigator(s): Emily Swaim, Richard Peel Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): None Slope (%): 0  
 Subregion (LRR): A-2 Lat: 48.143761 Long: -122.16685671 Datum: WGS 84  
 Soil Map Unit Name: Custer fine 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 , Soil , or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |  |
|---|--|
| Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | <b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks:<br><p align="center">No wetland criteria observed; disked but typical. Non-wetland hydrology confirmed by groundwater monitoring study.</p>  |  |

**VEGETATION – Use scientific names of plants.**

| <u>Tree Stratum</u> (Plot size: <u>30 ft</u> )          | Absolute % Cover             | Dominant Species? | Indicator Status |                        |
|---|------------------------------|-------------------|------------------|------------------------|
| 1. _____  | _____                        | _____             | _____            |                        |
| 2. _____  | _____                        | _____             | _____            |                        |
| 3. _____  | _____                        | _____             | _____            |                        |
| 4. _____  | _____                        | _____             | _____            |                        |
|   |                              |                   |                  | <u>0</u> = Total Cover |
| <u>Sapling/Shrub Stratum</u> (Plot size: <u>15 ft</u> ) | 1. _____                     | _____             | _____            |                        |
| 2. _____  | _____                        | _____             | _____            |                        |
| 3. _____  | _____                        | _____             | _____            |                        |
| 4. _____  | _____                        | _____             | _____            |                        |
| 5. _____  | _____                        | _____             | _____            |                        |
|   |                              |                   |                  | <u>0</u> = Total Cover |
| <u>Herb Stratum</u> (Plot size: <u>5 ft</u> )           | 1. <u>Festuca idahoensis</u> | <u>5</u>          | <u>Yes</u>       | <u>FACU</u>            |
| 2. _____  | _____                        | _____             | _____            |                        |
| 3. _____  | _____                        | _____             | _____            |                        |
| 4. _____  | _____                        | _____             | _____            |                        |
| 5. _____  | _____                        | _____             | _____            |                        |
| 6. _____  | _____                        | _____             | _____            |                        |
| 7. _____  | _____                        | _____             | _____            |                        |
| 8. _____  | _____                        | _____             | _____            |                        |
| 9. _____  | _____                        | _____             | _____            |                        |
| 10. _____   | _____                        | _____             | _____            |                        |
| 11. _____   | _____                        | _____             | _____            |                        |
|   |                              |                   |                  | <u>5</u> = Total Cover |
| <u>Woody Vine Stratum</u> (Plot size: <u>30 ft</u> )    | 1. _____                     | _____             | _____            |                        |
| 2. _____  | _____                        | _____             | _____            |                        |
|   |                              |                   |                  | <u>0</u> = Total Cover |
| % Bare Ground in Herb Stratum <u>95</u>                 |                              |                   |                  |                        |

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)  
 Total Number of Dominant Species Across All Strata: 1 (B)  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

**Prevalence Index worksheet:**  
 Total % Cover of: \_\_\_\_\_ Multiply by:  
 OBL species 0 x 1 = 0  
 FACW species 0 x 2 = 0  
 FAC species 0 x 3 = 0  
 FACU species 5 x 4 = 20  
 UPL species 0 x 5 = 0  
 Column Totals: 5 (A) 20 (B)  
 Prevalence Index = B/A = 4

**Hydrophytic Vegetation Indicators:**  
 Rapid Test for Hydrophytic Vegetation  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes  No

Remarks: No hydrophytic vegetation indicators observed.

**SOIL**

Sampling Point: DP-24

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

| Depth (inches) | Matrix        |     | Redox Features |    |                   | Loc <sup>2</sup> | Texture | Remarks                  |
|----------------|---------------|-----|----------------|----|-------------------|------------------|---------|--------------------------|
|                | Color (moist) | %   | Color (moist)  | %  | Type <sup>1</sup> |                  |         |                          |
| 0 - 9          | 10YR 3/3      | 98  | 10YR 4/6       | 2  | CS                | M, PL            | SaLo    | Mixed organics disturbed |
| 9 - 13         | 2.5Y 4/3      | 90  | 2.5Y 5/6       | 10 | CS                | M                | Sand    | Coarse                   |
| 13 - 15        | 10YR 3/1      | 100 |                |    |                   |                  | SaLo    |                          |
| 15 - 24        | 2.5Y 4/3      | 93  | 2.5Y 5/4       | 7  | CS                | M                | Sand    | Coarse                   |
| 24 - 30        | 5GY 6/1       | 95  | 7.5YR 5/4      | 5  | C                 | M, PL            | SaClLo  | Very coarse              |
|                |               |     |                |    |                   |                  |         |                          |
|                |               |     |                |    |                   |                  |         |                          |

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

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

|  |  |   |
|--|--|---|
| <input type="checkbox"/> Histosol (A1)                     | <input type="checkbox"/> Sandy Redox (S5)                                  | <b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b> |
| <input type="checkbox"/> Histic Epipedon (A2)              | <input type="checkbox"/> Stripped Matrix (S6)                              |   |
| <input type="checkbox"/> Black Histic (A3)                 | <input type="checkbox"/> Loamy Mucky Mineral (F1) ( <b>except MLRA 1</b> ) |   |
| <input type="checkbox"/> Hydrogen Sulfide (A4)             | <input type="checkbox"/> Loamy Gleyed Matrix (F2)                          |   |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Depleted Matrix (F3)                              |   |
| <input type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Redox Dark Surface (F6)                           |   |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)          | <input type="checkbox"/> Depleted Dark Surface (F7)                        |   |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4)          | <input type="checkbox"/> Redox Depressions (F8)                            |   |
|  |  |   |
|  |  |   |

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

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if present):**  
 Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

**Hydric Soil Present?** Yes  No

Remarks:  
 No hydric soils indicators observed.

**HYDROLOGY**

**Wetland Hydrology Indicators:**

|   |   |
|---|---|
| <b>Primary Indicators (minimum of one required; check all that apply)</b>   | <b>Secondary Indicators (2 or more required)</b>  |
| <input type="checkbox"/> Surface Water (A1)<br><input checked="" type="checkbox"/> High Water Table (A2)<br><input checked="" type="checkbox"/> Saturation (A3)<br><input type="checkbox"/> Water Marks (B1)<br><input type="checkbox"/> Sediment Deposits (B2)<br><input type="checkbox"/> Drift Deposits (B3)<br><input type="checkbox"/> Algal Mat or Crust (B4)<br><input type="checkbox"/> Iron Deposits (B5)<br><input type="checkbox"/> Surface Soil Cracks (B6)<br><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)<br><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | <input type="checkbox"/> Water-Stained Leaves (B9) ( <b>except MLRA 1, 2, 4A, and 4B</b> )<br><input type="checkbox"/> Salt Crust (B11)<br><input type="checkbox"/> Aquatic Invertebrates (B13)<br><input type="checkbox"/> Hydrogen Sulfide Odor (C1)<br><input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)<br><input type="checkbox"/> Presence of Reduced Iron (C4)<br><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)<br><input type="checkbox"/> Stunted or Stressed Plants (D1) ( <b>LRR A</b> )<br><input type="checkbox"/> Other (Explain in Remarks) |
|   | <input type="checkbox"/> Water-Stained Leaves (B9) ( <b>MLRA 1, 2, 4A, and 4B</b> )<br><input type="checkbox"/> Drainage Patterns (B10)<br><input type="checkbox"/> Dry-Season Water Table (C2)<br><input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)<br><input type="checkbox"/> Geomorphic Position (D2)<br><input type="checkbox"/> Shallow Aquitard (D3)<br><input type="checkbox"/> FAC-Neutral Test (D5)<br><input type="checkbox"/> Raised Ant Mounds (D6) ( <b>LRR A</b> )<br><input type="checkbox"/> Frost-Heave Hummocks (D7)  |

**Field Observations:**

|  |   |                           |   |
|--|---|---------------------------|---|
| Surface Water Present?   | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | Depth (inches): _____     | <b>Wetland Hydrology Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Water Table Present?   | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | Depth (inches): <u>12</u> |   |
| Saturation Present?<br>(includes capillary fringe)   | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | Depth (inches): <u>8</u>  |   |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: |   |                           |   |

Remarks:  
 Wetland hydrology criterion observed through A2 & A3 primary indicators during non-growing season at time of monitoring well installation on March 2, 2018. Monitoring well installed at monitoring location MP-24 indicated non-wetland hydrology. Monitoring well was observed weekly from March 6 to June 5, 2018.

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

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 03/02/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-25  
 Investigator(s): Emily Swaim, Richard Peel Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): Concave Slope (%): 0  
 Subregion (LRR): A-2 Lat: 48.143104 Long: -122.16566580 Datum: WGS 84  
 Soil Map Unit Name: Norma 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 , Soil , or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |   |
|---|---|
| Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | <b>Is the Sampled Area<br/>within a Wetland?</b><br>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks:<br><p style="text-align: center; font-weight: bold;">No wetland criteria observed. Non-wetland hydrology confirmed by groundwater monitoring study.</p>  |   |

### VEGETATION – Use scientific names of plants.

|   | Absolute % Cover | Dominant Species? | Indicator Status |  |
|---|------------------|-------------------|------------------|--|
| <b>Tree Stratum</b> (Plot size: <u>30 ft</u> )          |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| <b>Sapling/Shrub Stratum</b> (Plot size: <u>15 ft</u> ) |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
| 5. _____  | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| <b>Herb Stratum</b> (Plot size: <u>5 ft</u> )           |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
| 5. _____  | _____            | _____             | _____            |  |
| 6. _____  | _____            | _____             | _____            |  |
| 7. _____  | _____            | _____             | _____            |  |
| 8. _____  | _____            | _____             | _____            |  |
| 9. _____  | _____            | _____             | _____            |  |
| 10. _____   | _____            | _____             | _____            |  |
| 11. _____   | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| <b>Woody Vine Stratum</b> (Plot size: <u>30 ft</u> )    |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| <b>% Bare Ground in Herb Stratum</b> <u>100</u>         |                  |                   |                  |  |

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)  
 Total Number of Dominant Species Across All Strata: 0 (B)  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

**Prevalence Index worksheet:**  
 Total % Cover of: \_\_\_\_\_ Multiply by:  
 OBL species 0 x 1 = 0  
 FACW species 0 x 2 = 0  
 FAC species 0 x 3 = 0  
 FACU species 0 x 4 = 0  
 UPL species 0 x 5 = 0  
 Column Totals: 0 (A) 0 (B)  
 Prevalence Index = B/A = \_\_\_\_\_

**Hydrophytic Vegetation Indicators:**  
 Rapid Test for Hydrophytic Vegetation  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes  No

Remarks: No hydrophytic vegetation indicators observed.



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

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 03/02/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-26  
 Investigator(s): Emily Swaim, Richard Peel Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): None Slope (%): 0  
 Subregion (LRR): A-2 Lat: 48.142818 Long: -122.16691051 Datum: WGS 84  
 Soil Map Unit Name: Norma 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 , Soil , or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |  |
|---|--|
| Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | <b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks:<br><p style="text-align: center; font-weight: bold;">No wetland criteria observed. Non-wetland hydrology confirmed by groundwater monitoring study.</p>  |  |

### VEGETATION – Use scientific names of plants.

|   | Absolute % Cover | Dominant Species? | Indicator Status |  |
|---|------------------|-------------------|------------------|--|
| <b>Tree Stratum</b> (Plot size: <u>30 ft</u> )          |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| <b>Sapling/Shrub Stratum</b> (Plot size: <u>15 ft</u> ) |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
| 5. _____  | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| <b>Herb Stratum</b> (Plot size: <u>5 ft</u> )           |                  |                   |                  |  |
| 1. <u>Prunella vulgaris</u>                             | <u>60</u>        | <u>Yes</u>        | <u>FACU</u>      |  |
| 2. <u>Cardamine oligosperma</u>                         | <u>15</u>        | <u>No</u>         | <u>FAC</u>       |  |
| 3. <u>Vicia americana</u>                               | <u>15</u>        | <u>No</u>         | <u>FAC</u>       |  |
| 4. _____  | _____            | _____             | _____            |  |
| 5. _____  | _____            | _____             | _____            |  |
| 6. _____  | _____            | _____             | _____            |  |
| 7. _____  | _____            | _____             | _____            |  |
| 8. _____  | _____            | _____             | _____            |  |
| 9. _____  | _____            | _____             | _____            |  |
| 10. _____   | _____            | _____             | _____            |  |
| 11. _____   | _____            | _____             | _____            |  |
|   | <u>90</u>        | = Total Cover     |                  |  |
| <b>Woody Vine Stratum</b> (Plot size: <u>30 ft</u> )    |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| <b>% Bare Ground in Herb Stratum</b> <u>10</u>          |                  |                   |                  |  |

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)  
 Total Number of Dominant Species Across All Strata: 1 (B)  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

**Prevalence Index worksheet:**  
 Total % Cover of: \_\_\_\_\_ Multiply by:  
 OBL species 0 x 1 = 0  
 FACW species 0 x 2 = 0  
 FAC species 30 x 3 = 90  
 FACU species 60 x 4 = 240  
 UPL species 0 x 5 = 0  
 Column Totals: 90 (A) 330 (B)  
 Prevalence Index = B/A = 3.67

**Hydrophytic Vegetation Indicators:**  
 Rapid Test for Hydrophytic Vegetation  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes  No

Remarks: No hydrophytic vegetation indicators observed.



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

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 03/02/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-27  
 Investigator(s): Emily Swaim, Richard Peel Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): Concave Slope (%): 0  
 Subregion (LRR): A-2 Lat: 48.143844 Long: -122.16838588 Datum: WGS 84  
 Soil Map Unit Name: Norma 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 \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |   |
|---|---|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | <b>Is the Sampled Area<br/>within a Wetland?</b><br>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks: <b>Not all three wetland criteria observed, only hydrophytic vegetation and hydric soil present. Non-wetland hydrology confirmed by groundwater monitoring study.</b>  |   |

### VEGETATION – Use scientific names of plants.

| <u>Tree Stratum</u> (Plot size: <u>30 ft</u> )          | Absolute % Cover | Dominant Species? | Indicator Status |  |
|---|------------------|-------------------|------------------|--|
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
| <u>0</u> = Total Cover                                  |                  |                   |                  |  |
| <u>Sapling/Shrub Stratum</u> (Plot size: <u>15 ft</u> ) |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
| 5. _____  | _____            | _____             | _____            |  |
| <u>0</u> = Total Cover                                  |                  |                   |                  |  |
| <u>Herb Stratum</u> (Plot size: <u>5 ft</u> )           |                  |                   |                  |  |
| 1. <u>Agrostis capillaris</u>                           | <u>60</u>        | <u>Yes</u>        | <u>FAC</u>       |  |
| 2. <u>Lotus corniculatus</u>                            | <u>40</u>        | <u>Yes</u>        | <u>FAC</u>       |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
| 5. _____  | _____            | _____             | _____            |  |
| 6. _____  | _____            | _____             | _____            |  |
| 7. _____  | _____            | _____             | _____            |  |
| 8. _____  | _____            | _____             | _____            |  |
| 9. _____  | _____            | _____             | _____            |  |
| 10. _____   | _____            | _____             | _____            |  |
| 11. _____   | _____            | _____             | _____            |  |
| <u>100</u> = Total Cover                                |                  |                   |                  |  |
| <u>Woody Vine Stratum</u> (Plot size: <u>30 ft</u> )    |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
| <u>0</u> = Total Cover                                  |                  |                   |                  |  |
| % Bare Ground in Herb Stratum <u>0</u>                  |                  |                   |                  |  |

**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 100 x 3 = 300  
 FACU species 0 x 4 = 0  
 UPL species 0 x 5 = 0  
 Column Totals: 100 (A) 300 (B)  
 Prevalence Index = B/A = 3

**Hydrophytic Vegetation Indicators:**  
 Rapid Test for Hydrophytic Vegetation  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes  No

Remarks: **Hydrophytic vegetation criterion observed through dominance test indicator.**

**SOIL**

Sampling Point: DP-27

| Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) |               |    |                |    |                   |                  |         |         |  |
|---|---------------|----|----------------|----|-------------------|------------------|---------|---------|--|
| Depth (inches)  | Matrix        |    | Redox Features |    |                   | Loc <sup>2</sup> | Texture | Remarks |  |
|   | Color (moist) | %  | Color (moist)  | %  | Type <sup>1</sup> |                  |         |         |  |
| 0 - 15  | 10YR 3/1      | 98 | 5yr 3/4        | 2  | C                 | M, PL            | SaLo    |         |  |
| 15 - 17   | 5gy 4/1       | 90 | 10YR 5/6       | 10 | C                 | M, PL            | LoSa    |         |  |
| 17 - 30   | 5gy 4/1       | 99 | 10YR 5/6       | 1  | CS                | M                | Sand    | Coarse  |  |
|   |               |    |                |    |                   |                  |         |         |  |
|   |               |    |                |    |                   |                  |         |         |  |
|   |               |    |                |    |                   |                  |         |         |  |
|   |               |    |                |    |                   |                  |         |         |  |
|   |               |    |                |    |                   |                  |         |         |  |

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

|  |  |   |
|--|--|---|
| <b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b><br><input type="checkbox"/> Histosol (A1)<br><input type="checkbox"/> Histic Epipedon (A2)<br><input type="checkbox"/> Black Histic (A3)<br><input type="checkbox"/> Hydrogen Sulfide (A4)<br><input type="checkbox"/> Depleted Below Dark Surface (A11)<br><input type="checkbox"/> Thick Dark Surface (A12)<br><input type="checkbox"/> Sandy Mucky Mineral (S1)<br><input type="checkbox"/> Sandy Gleyed Matrix (S4) | <input type="checkbox"/> Sandy Redox (S5)<br><input type="checkbox"/> Stripped Matrix (S6)<br><input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)<br><input type="checkbox"/> Loamy Gleyed Matrix (F2)<br><input type="checkbox"/> Depleted Matrix (F3)<br><input checked="" type="checkbox"/> Redox Dark Surface (F6)<br><input type="checkbox"/> Depleted Dark Surface (F7)<br><input type="checkbox"/> Redox Depressions (F8) | <b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b><br><input type="checkbox"/> 2 cm Muck (A10)<br><input type="checkbox"/> Red Parent Material (TF2)<br><input type="checkbox"/> Very Shallow Dark Surface (TF12)<br><input type="checkbox"/> Other (Explain in Remarks) |
|--|--|---|

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

|  |   |
|--|---|
| <b>Restrictive Layer (if present):</b><br>Type: _____<br>Depth (inches): _____ | <b>Hydric Soil Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
|--|---|

Remarks:  
Hydric soil criterion observed through F6 indicator.

**HYDROLOGY**

|  |   |  |  |
|--|---|--|--|
| <b>Wetland Hydrology Indicators:</b><br>Primary Indicators (minimum of one required; check all that apply)   |   | Secondary Indicators (2 or more required)  |  |
| <input type="checkbox"/> Surface Water (A1)<br><input checked="" type="checkbox"/> High Water Table (A2)<br><input type="checkbox"/> Saturation (A3)<br><input type="checkbox"/> Water Marks (B1)<br><input type="checkbox"/> Sediment Deposits (B2)<br><input type="checkbox"/> Drift Deposits (B3)<br><input type="checkbox"/> Algal Mat or Crust (B4)<br><input type="checkbox"/> Iron Deposits (B5)<br><input type="checkbox"/> Surface Soil Cracks (B6)<br><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)<br><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | <input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)<br><input type="checkbox"/> Salt Crust (B11)<br><input type="checkbox"/> Aquatic Invertebrates (B13)<br><input type="checkbox"/> Hydrogen Sulfide Odor (C1)<br><input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)<br><input type="checkbox"/> Presence of Reduced Iron (C4)<br><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)<br><input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)<br><input type="checkbox"/> Other (Explain in Remarks) | <input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)<br><input type="checkbox"/> Drainage Patterns (B10)<br><input type="checkbox"/> Dry-Season Water Table (C2)<br><input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)<br><input type="checkbox"/> Geomorphic Position (D2)<br><input type="checkbox"/> Shallow Aquitard (D3)<br><input type="checkbox"/> FAC-Neutral Test (D5)<br><input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)<br><input type="checkbox"/> Frost-Heave Hummocks (D7) |  |
| <b>Field Observations:</b><br>Surface Water Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____<br>Water Table Present?    Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>12</u><br>Saturation Present?    Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>7</u><br>(includes capillary fringe)   |   | <b>Wetland Hydrology Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>  |  |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:   |   |  |  |
| Remarks:<br>Wetland hydrology criterion observed through A2 primary indicator during non-growing season at time of monitoring well installation on March 2, 2018. Monitoring well installed at monitoring location MP-27 indicated non-wetland hydrology. Monitoring well was observed weekly from March 6 to June 5, 2018.  |   |  |  |

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

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 03/02/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-28  
 Investigator(s): Emily Swaim, Richard Peel Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): None Slope (%): 0  
 Subregion (LRR): A-2 Lat: 48.143877 Long: -122.16963728 Datum: WGS 84  
 Soil Map Unit Name: Norma 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 , Soil , or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |  |
|---|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | <b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks: <b>Not all three wetland criteria observed, only hydrophytic vegetation present. Non-wetland hydrology confirmed by groundwater monitoring study.</b>  |  |

**VEGETATION – Use scientific names of plants.**

| <u>Tree Stratum</u> (Plot size: <u>30 ft</u> )          | <u>Absolute % Cover</u> | <u>Dominant Species?</u> | <u>Indicator Status</u> |                          |
|---|-------------------------|--------------------------|-------------------------|--------------------------|
| 1. _____  | _____                   | _____                    | _____                   |                          |
| 2. _____  | _____                   | _____                    | _____                   |                          |
| 3. _____  | _____                   | _____                    | _____                   |                          |
| 4. _____  | _____                   | _____                    | _____                   |                          |
|   |                         |                          |                         | <u>0</u> = Total Cover   |
| <u>Sapling/Shrub Stratum</u> (Plot size: <u>15 ft</u> ) |                         |                          |                         |                          |
| 1. _____  | _____                   | _____                    | _____                   |                          |
| 2. _____  | _____                   | _____                    | _____                   |                          |
| 3. _____  | _____                   | _____                    | _____                   |                          |
| 4. _____  | _____                   | _____                    | _____                   |                          |
| 5. _____  | _____                   | _____                    | _____                   |                          |
|   |                         |                          |                         | <u>0</u> = Total Cover   |
| <u>Herb Stratum</u> (Plot size: <u>5 ft</u> )           |                         |                          |                         |                          |
| 1. <u>Agrostis capillaris</u>                           | <u>60</u>               | <u>Yes</u>               | <u>FAC</u>              |                          |
| 2. <u>Lotus corniculatus</u>                            | <u>40</u>               | <u>Yes</u>               | <u>FAC</u>              |                          |
| 3. _____  | _____                   | _____                    | _____                   |                          |
| 4. _____  | _____                   | _____                    | _____                   |                          |
| 5. _____  | _____                   | _____                    | _____                   |                          |
| 6. _____  | _____                   | _____                    | _____                   |                          |
| 7. _____  | _____                   | _____                    | _____                   |                          |
| 8. _____  | _____                   | _____                    | _____                   |                          |
| 9. _____  | _____                   | _____                    | _____                   |                          |
| 10. _____   | _____                   | _____                    | _____                   |                          |
| 11. _____   | _____                   | _____                    | _____                   |                          |
|   |                         |                          |                         | <u>100</u> = Total Cover |
| <u>Woody Vine Stratum</u> (Plot size: <u>30 ft</u> )    |                         |                          |                         |                          |
| 1. _____  | _____                   | _____                    | _____                   |                          |
| 2. _____  | _____                   | _____                    | _____                   |                          |
|   |                         |                          |                         | <u>0</u> = Total Cover   |
| % Bare Ground in Herb Stratum <u>0</u>                  |                         |                          |                         |                          |

**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:**  
 Rapid Test for Hydrophytic Vegetation  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes  No

Remarks: **Hydrophytic vegetation criterion observed through dominance test indicator.**

**SOIL**

Sampling Point: DP-28

| <b>Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)</b>                             |               |   |                |   |                   |   |         |         |
|--|---------------|---|----------------|---|-------------------|---|---------|---------|
| Depth<br>(inches)  | Matrix        |   | Redox Features |   |                   | Loc <sup>2</sup>  | Texture | Remarks |
|  | Color (moist) | %   | Color (moist)  | %   | Type <sup>1</sup> |   |         |         |
| 0 - 5  | 10YR 3/2      | 100   |                |   |                   |   | SaLo    |         |
| 5 - 14   | 10YR 3/2      | 98  | 10YR 5/8       | 2   | C                 | M, PL   | SaLo    |         |
| 14 - 21  | 10YR 3/2      | 96  | 10YR 5/8       | 5   | C                 | M, PL   | SaLo    |         |
| 21 - 24  | 10YR 6/8      | 100   |                |   |                   |   | SaLo    |         |
| 24 - 30  | 2.5Y 4/2      | 98  | 2.5 Y 5/4      | 2   | CS                | M, PL   | LoSa    |         |
|  |               |   |                |   |                   |   |         |         |
|  |               |   |                |   |                   |   |         |         |
| <sup>1</sup> Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup> Location: PL=Pore Lining, M=Matrix. |               |   |                |   |                   |   |         |         |
| <b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b>   |               |   |                |   |                   | <b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b>                                     |         |         |
| <input type="checkbox"/> Histosol (A1)   |               | <input type="checkbox"/> Sandy Redox (S5)                         |                | <input type="checkbox"/> 2 cm Muck (A10)                  |                   |   |         |         |
| <input type="checkbox"/> Histic Epipedon (A2)  |               | <input type="checkbox"/> Stripped Matrix (S6)                     |                | <input type="checkbox"/> Red Parent Material (TF2)        |                   |   |         |         |
| <input type="checkbox"/> Black Histic (A3)   |               | <input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1) |                | <input type="checkbox"/> Very Shallow Dark Surface (TF12) |                   |   |         |         |
| <input type="checkbox"/> Hydrogen Sulfide (A4)   |               | <input type="checkbox"/> Loamy Gleyed Matrix (F2)                 |                | <input type="checkbox"/> Other (Explain in Remarks)       |                   |   |         |         |
| <input type="checkbox"/> Depleted Below Dark Surface (A11)   |               | <input type="checkbox"/> Depleted Matrix (F3)                     |                | <sup>3</sup> Indicators of hydrophytic vegetation and     |                   |   |         |         |
| <input type="checkbox"/> Thick Dark Surface (A12)  |               | <input type="checkbox"/> Redox Dark Surface (F6)                  |                | wetland hydrology must be present,                        |                   |   |         |         |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)  |               | <input type="checkbox"/> Depleted Dark Surface (F7)               |                | unless disturbed or problematic.                          |                   |   |         |         |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4)  |               | <input type="checkbox"/> Redox Depressions (F8)                   |                |   |                   |   |         |         |
| <b>Restrictive Layer (if present):</b>   |               |   |                |   |                   |   |         |         |
| Type: _____  |               |   |                |   |                   |   |         |         |
| Depth (inches): _____  |               |   |                |   |                   | <b>Hydric Soil Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |         |         |
| Remarks:<br>No hydric soils indicators observed.   |               |   |                |   |                   |   |         |         |

**HYDROLOGY**

| <b>Wetland Hydrology Indicators:</b>  |   |   |  |
|---|---|---|--|
| Primary Indicators (minimum of one required; check all that apply)  |   | Secondary Indicators (2 or more required)   |  |
| <input type="checkbox"/> Surface Water (A1)   | <input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) | <input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)                            |  |
| <input type="checkbox"/> High Water Table (A2)  | <input type="checkbox"/> Salt Crust (B11)   | <input type="checkbox"/> Drainage Patterns (B10)  |  |
| <input checked="" type="checkbox"/> Saturation (A3)   | <input type="checkbox"/> Aquatic Invertebrates (B13)                              | <input type="checkbox"/> Dry-Season Water Table (C2)  |  |
| <input type="checkbox"/> Water Marks (B1)   | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                               | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)                                    |  |
| <input type="checkbox"/> Sediment Deposits (B2)   | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)            | <input type="checkbox"/> Geomorphic Position (D2)   |  |
| <input type="checkbox"/> Drift Deposits (B3)  | <input type="checkbox"/> Presence of Reduced Iron (C4)                            | <input type="checkbox"/> Shallow Aquitard (D3)  |  |
| <input type="checkbox"/> Algal Mat or Crust (B4)  | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)               | <input type="checkbox"/> FAC-Neutral Test (D5)  |  |
| <input type="checkbox"/> Iron Deposits (B5)   | <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)                  | <input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)   |  |
| <input type="checkbox"/> Surface Soil Cracks (B6)   | <input type="checkbox"/> Other (Explain in Remarks)                               | <input type="checkbox"/> Frost-Heave Hummocks (D7)  |  |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)  |   |   |  |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)  |   |   |  |
| <b>Field Observations:</b>  |   |   |  |
| Surface Water Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>   | Depth (inches): _____   |   |  |
| Water Table Present?    Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>   | Depth (inches): <u>13</u>   |   |  |
| Saturation Present?    Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>  | Depth (inches): <u>9</u>  | <b>Wetland Hydrology Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |  |
| (includes capillary fringe)   |   |   |  |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:  |   |   |  |
| Remarks:<br>Wetland hydrology criterion observed through A3 primary indicator during non-growing season at time of monitoring well installation on March 2, 2018. Monitoring well installed at monitoring location MP-28 indicated non-wetland hydrology. Monitoring well was observed weekly from March 6 to June 5, 2018. |   |   |  |

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

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 03/02/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-29  
 Investigator(s): Emily Swaim, Richard Peel Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): Concave Slope (%): 0  
 Subregion (LRR): A-2 Lat: 48.1438907 Long: -122.1708443 Datum: WGS 84  
 Soil Map Unit Name: Norma 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 , Soil , or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |  |
|---|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | <b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks:<br><p align="center"><b>Not all three wetland criteria observed, hydrophytic vegetation and wetland hydrology present.</b></p>   |  |

**VEGETATION – Use scientific names of plants.**

| <u>Tree Stratum</u> (Plot size: <u>30 ft</u> )          | <u>Absolute % Cover</u> | <u>Dominant Species?</u> | <u>Indicator Status</u> |                          |
|---|-------------------------|--------------------------|-------------------------|--------------------------|
| 1. _____  | _____                   | _____                    | _____                   |                          |
| 2. _____  | _____                   | _____                    | _____                   |                          |
| 3. _____  | _____                   | _____                    | _____                   |                          |
| 4. _____  | _____                   | _____                    | _____                   |                          |
|   |                         |                          |                         | <u>0</u> = Total Cover   |
| <u>Sapling/Shrub Stratum</u> (Plot size: <u>15 ft</u> ) |                         |                          |                         |                          |
| 1. _____  | _____                   | _____                    | _____                   |                          |
| 2. _____  | _____                   | _____                    | _____                   |                          |
| 3. _____  | _____                   | _____                    | _____                   |                          |
| 4. _____  | _____                   | _____                    | _____                   |                          |
| 5. _____  | _____                   | _____                    | _____                   |                          |
|   |                         |                          |                         | <u>0</u> = Total Cover   |
| <u>Herb Stratum</u> (Plot size: <u>5 ft</u> )           |                         |                          |                         |                          |
| 1. <u>Lolium perenne</u>                                | <u>90</u>               | <u>Yes</u>               | <u>FAC</u>              |                          |
| 2. <u>Lotus corniculatus</u>                            | <u>10</u>               | <u>No</u>                | <u>FAC</u>              |                          |
| 3. _____  | _____                   | _____                    | _____                   |                          |
| 4. _____  | _____                   | _____                    | _____                   |                          |
| 5. _____  | _____                   | _____                    | _____                   |                          |
| 6. _____  | _____                   | _____                    | _____                   |                          |
| 7. _____  | _____                   | _____                    | _____                   |                          |
| 8. _____  | _____                   | _____                    | _____                   |                          |
| 9. _____  | _____                   | _____                    | _____                   |                          |
| 10. _____   | _____                   | _____                    | _____                   |                          |
| 11. _____   | _____                   | _____                    | _____                   |                          |
|   |                         |                          |                         | <u>100</u> = Total Cover |
| <u>Woody Vine Stratum</u> (Plot size: <u>30 ft</u> )    |                         |                          |                         |                          |
| 1. _____  | _____                   | _____                    | _____                   |                          |
| 2. _____  | _____                   | _____                    | _____                   |                          |
|   |                         |                          |                         | <u>0</u> = Total Cover   |
| % Bare Ground in Herb Stratum <u>0</u>                  |                         |                          |                         |                          |

**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:**  
 Rapid Test for Hydrophytic Vegetation  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes  No

Remarks: Hydrophytic vegetation criterion observed through dominance test indicator.



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

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 03/01/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-3  
 Investigator(s): Emily Swaim, Jon Pickett, Richard Peel Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): None Slope (%): 0  
 Subregion (LRR): A-2 Lat: 48.140747 Long: -122.16332835 Datum: WGS 84  
 Soil Map Unit Name: Custer fine 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 , Soil , or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |  |
|---|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | <b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| Remarks: <u>Wetland A plot. All three wetland criteria observed; tilled. Wetland hydrology confirmed by groundwater monitoring study.</u>   |  |

**VEGETATION – Use scientific names of plants.**

| <u>Tree Stratum</u> (Plot size: <u>30 ft</u> )          | <u>Absolute % Cover</u> | <u>Dominant Species?</u> | <u>Indicator Status</u> |                         |
|---|-------------------------|--------------------------|-------------------------|-------------------------|
| 1. _____  | _____                   | _____                    | _____                   |                         |
| 2. _____  | _____                   | _____                    | _____                   |                         |
| 3. _____  | _____                   | _____                    | _____                   |                         |
| 4. _____  | _____                   | _____                    | _____                   |                         |
|   |                         |                          |                         | <u>0</u> = Total Cover  |
| <u>Sapling/Shrub Stratum</u> (Plot size: <u>15 ft</u> ) |                         |                          |                         |                         |
| 1. _____  | _____                   | _____                    | _____                   |                         |
| 2. _____  | _____                   | _____                    | _____                   |                         |
| 3. _____  | _____                   | _____                    | _____                   |                         |
| 4. _____  | _____                   | _____                    | _____                   |                         |
| 5. _____  | _____                   | _____                    | _____                   |                         |
|   |                         |                          |                         | <u>0</u> = Total Cover  |
| <u>Herb Stratum</u> (Plot size: <u>5 ft</u> )           |                         |                          |                         |                         |
| 1. <u>Agrostis capillaris</u>                           | <u>75</u>               | <u>Yes</u>               | <u>FAC</u>              |                         |
| 2. _____  | _____                   | _____                    | _____                   |                         |
| 3. _____  | _____                   | _____                    | _____                   |                         |
| 4. _____  | _____                   | _____                    | _____                   |                         |
| 5. _____  | _____                   | _____                    | _____                   |                         |
| 6. _____  | _____                   | _____                    | _____                   |                         |
| 7. _____  | _____                   | _____                    | _____                   |                         |
| 8. _____  | _____                   | _____                    | _____                   |                         |
| 9. _____  | _____                   | _____                    | _____                   |                         |
| 10. _____   | _____                   | _____                    | _____                   |                         |
| 11. _____   | _____                   | _____                    | _____                   |                         |
|   |                         |                          |                         | <u>75</u> = Total Cover |
| <u>Woody Vine Stratum</u> (Plot size: <u>30 ft</u> )    |                         |                          |                         |                         |
| 1. _____  | _____                   | _____                    | _____                   |                         |
| 2. _____  | _____                   | _____                    | _____                   |                         |
|   |                         |                          |                         | <u>0</u> = Total Cover  |
| <u>% Bare Ground in Herb Stratum</u> <u>25</u>          |                         |                          |                         |                         |

**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 0 x 2 = 0  
 FAC species 75 x 3 = 225  
 FACU species 0 x 4 = 0  
 UPL species 0 x 5 = 0  
 Column Totals: 75 (A) 225 (B)  
 Prevalence Index = B/A = 3

**Hydrophytic Vegetation Indicators:**  
 Rapid Test for Hydrophytic Vegetation  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes  No

Remarks: Hydrophytic vegetation criterion observed through dominance test indicator.



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

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 03/02/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-30  
 Investigator(s): Emily Swaim, Richard Peel Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): Concave Slope (%): 0  
 Subregion (LRR): A-2 Lat: 48.144211 Long: -122.17151818 Datum: WGS 84  
 Soil Map Unit Name: Norma 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 \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |  |
|---|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | <b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| Remarks: <b>Wetland F plot. All three wetland criteria observed. Wetland hydrology confirmed by groundwater monitoring study.</b>   |  |

**VEGETATION – Use scientific names of plants.**

| <u>Tree Stratum</u> (Plot size: <u>30 ft</u> )  | <u>Absolute % Cover</u> | <u>Dominant Species?</u> | <u>Indicator Status</u> | <b>Dominance Test worksheet:</b>  |
|---|-------------------------|--------------------------|-------------------------|---|
| 1. _____  | _____                   | _____                    | _____                   | Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)<br><br>Total Number of Dominant Species Across All Strata: <u>1</u> (B)<br><br>Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)  |
| 2. _____  | _____                   | _____                    | _____                   |   |
| 3. _____  | _____                   | _____                    | _____                   |   |
| 4. _____  | _____                   | _____                    | _____                   |   |
| <u>0</u> = Total Cover  |                         |                          |                         | <b>Prevalence Index worksheet:</b><br>Total % Cover of: _____ Multiply by:<br>OBL species _____ x 1 = _____<br>FACW species _____ x 2 = _____<br>FAC species _____ x 3 = _____<br>FACU species _____ x 4 = _____<br>UPL species _____ x 5 = _____<br>Column Totals: _____ (A) _____ (B)<br><br>Prevalence Index = B/A = _____ |
| <b>Sapling/Shrub Stratum</b> (Plot size: <u>15 ft</u> )   |                         |                          |                         |   |
| 1. _____  | _____                   | _____                    | _____                   |   |
| 2. _____  | _____                   | _____                    | _____                   |   |
| 3. _____  | _____                   | _____                    | _____                   |   |
| 4. _____  | _____                   | _____                    | _____                   |   |
| 5. _____  | _____                   | _____                    | _____                   |   |
| <u>0</u> = Total Cover  |                         |                          |                         |   |
| <b>Herb Stratum</b> (Plot size: <u>5 ft</u> )   |                         |                          |                         |   |
| 1. <u>Lolium perenne</u>  | <u>90</u>               | <u>Yes</u>               | <u>FAC</u>              |   |
| 2. <u>Lotus corniculatus</u>  | <u>10</u>               | <u>No</u>                | <u>FAC</u>              |   |
| 3. _____  | _____                   | _____                    | _____                   |   |
| 4. _____  | _____                   | _____                    | _____                   |   |
| 5. _____  | _____                   | _____                    | _____                   |   |
| 6. _____  | _____                   | _____                    | _____                   |   |
| 7. _____  | _____                   | _____                    | _____                   |   |
| 8. _____  | _____                   | _____                    | _____                   |   |
| 9. _____  | _____                   | _____                    | _____                   |   |
| 10. _____   | _____                   | _____                    | _____                   |   |
| 11. _____   | _____                   | _____                    | _____                   |   |
| <u>100</u> = Total Cover  |                         |                          |                         |   |
| <b>Woody Vine Stratum</b> (Plot size: <u>30 ft</u> )  |                         |                          |                         |   |
| 1. _____  | _____                   | _____                    | _____                   |   |
| 2. _____  | _____                   | _____                    | _____                   |   |
| <u>0</u> = Total Cover  |                         |                          |                         |   |
| % Bare Ground in Herb Stratum <u>0</u>  |                         |                          |                         |   |
| <b>Hydrophytic Vegetation Indicators:</b><br><input type="checkbox"/> Rapid Test for Hydrophytic Vegetation<br><input checked="" type="checkbox"/> Dominance Test is >50%<br><input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup><br><input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)<br><input type="checkbox"/> Wetland Non-Vascular Plants <sup>1</sup><br><input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)<br><small><sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.</small> |                         |                          |                         |   |
| <b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>  |                         |                          |                         |   |

Remarks: **Hydrophytic vegetation criterion observed through dominance test indicator.**



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

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 03/02/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-31  
 Investigator(s): Emily Swaim, Richard Peel Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): None Slope (%): 0  
 Subregion (LRR): A-2 Lat: 48.144680 Long: -122.16967813 Datum: WGS 84  
 Soil Map Unit Name: Norma 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 \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |   |
|---|---|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | <b>Is the Sampled Area within a Wetland?</b><br>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks: <b>Not all three wetland criteria observed, only hydrophytic vegetation present. Non-wetland hydrology confirmed by groundwater monitoring study.</b>  |   |

### VEGETATION – Use scientific names of plants.

|   | Absolute % Cover | Dominant Species? | Indicator Status |   |                   |              |                      |                |                        |                 |                        |                  |                       |                |                      |                |                               |                |
|---|------------------|-------------------|------------------|---|-------------------|--------------|----------------------|----------------|------------------------|-----------------|------------------------|------------------|-----------------------|----------------|----------------------|----------------|-------------------------------|----------------|
| <b>Tree Stratum</b> (Plot size: <u>30 ft</u> )          |                  |                   |                  |   |                   |              |                      |                |                        |                 |                        |                  |                       |                |                      |                |                               |                |
| 1. _____  | _____            | _____             | _____            | <b>Dominance Test worksheet:</b><br>Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)<br><br>Total Number of Dominant Species Across All Strata: <u>2</u> (B)<br><br>Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)  |                   |              |                      |                |                        |                 |                        |                  |                       |                |                      |                |                               |                |
| 2. _____  | _____            | _____             | _____            |   |                   |              |                      |                |                        |                 |                        |                  |                       |                |                      |                |                               |                |
| 3. _____  | _____            | _____             | _____            |   |                   |              |                      |                |                        |                 |                        |                  |                       |                |                      |                |                               |                |
| 4. _____  | _____            | _____             | _____            |   |                   |              |                      |                |                        |                 |                        |                  |                       |                |                      |                |                               |                |
| _____   | <u>0</u>         | = Total Cover     |                  |   |                   |              |                      |                |                        |                 |                        |                  |                       |                |                      |                |                               |                |
| <b>Sapling/Shrub Stratum</b> (Plot size: <u>15 ft</u> ) |                  |                   |                  |   |                   |              |                      |                |                        |                 |                        |                  |                       |                |                      |                |                               |                |
| 1. <u>Salix sitchensis</u>                              | <u>15</u>        | <u>Yes</u>        | <u>FACW</u>      | <b>Prevalence Index worksheet:</b><br><table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">Total % Cover of:</td> <td style="text-align: center;">Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>15</u></td> <td>x 2 = <u>30</u></td> </tr> <tr> <td>FAC species <u>100</u></td> <td>x 3 = <u>300</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>115</u> (A)</td> <td><u>330</u> (B)</td> </tr> </table><br>Prevalence Index = B/A = <u>2.87</u> | Total % Cover of: | Multiply by: | OBL species <u>0</u> | x 1 = <u>0</u> | FACW species <u>15</u> | x 2 = <u>30</u> | FAC species <u>100</u> | x 3 = <u>300</u> | FACU species <u>0</u> | x 4 = <u>0</u> | UPL species <u>0</u> | x 5 = <u>0</u> | Column Totals: <u>115</u> (A) | <u>330</u> (B) |
| Total % Cover of:                                       | Multiply by:     |                   |                  |   |                   |              |                      |                |                        |                 |                        |                  |                       |                |                      |                |                               |                |
| OBL species <u>0</u>                                    | x 1 = <u>0</u>   |                   |                  |   |                   |              |                      |                |                        |                 |                        |                  |                       |                |                      |                |                               |                |
| FACW species <u>15</u>                                  | x 2 = <u>30</u>  |                   |                  |   |                   |              |                      |                |                        |                 |                        |                  |                       |                |                      |                |                               |                |
| FAC species <u>100</u>                                  | x 3 = <u>300</u> |                   |                  |   |                   |              |                      |                |                        |                 |                        |                  |                       |                |                      |                |                               |                |
| FACU species <u>0</u>                                   | x 4 = <u>0</u>   |                   |                  |   |                   |              |                      |                |                        |                 |                        |                  |                       |                |                      |                |                               |                |
| UPL species <u>0</u>                                    | x 5 = <u>0</u>   |                   |                  |   |                   |              |                      |                |                        |                 |                        |                  |                       |                |                      |                |                               |                |
| Column Totals: <u>115</u> (A)                           | <u>330</u> (B)   |                   |                  |   |                   |              |                      |                |                        |                 |                        |                  |                       |                |                      |                |                               |                |
| 2. _____  | _____            | _____             | _____            |   |                   |              |                      |                |                        |                 |                        |                  |                       |                |                      |                |                               |                |
| 3. _____  | _____            | _____             | _____            |   |                   |              |                      |                |                        |                 |                        |                  |                       |                |                      |                |                               |                |
| 4. _____  | _____            | _____             | _____            |   |                   |              |                      |                |                        |                 |                        |                  |                       |                |                      |                |                               |                |
| 5. _____  | <u>15</u>        | = Total Cover     |                  |   |                   |              |                      |                |                        |                 |                        |                  |                       |                |                      |                |                               |                |
| <b>Herb Stratum</b> (Plot size: <u>5 ft</u> )           |                  |                   |                  |   |                   |              |                      |                |                        |                 |                        |                  |                       |                |                      |                |                               |                |
| 1. <u>Lotus corniculatus</u>                            | <u>5</u>         | <u>No</u>         | <u>FAC</u>       | <b>Hydrophytic Vegetation Indicators:</b><br><input type="checkbox"/> Rapid Test for Hydrophytic Vegetation<br><input checked="" type="checkbox"/> Dominance Test is >50%<br><input checked="" type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup><br><input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)<br><input type="checkbox"/> Wetland Non-Vascular Plants <sup>1</sup><br><input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)<br><br><sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.                    |                   |              |                      |                |                        |                 |                        |                  |                       |                |                      |                |                               |                |
| 2. <u>Holcus lanatus</u>                                | <u>95</u>        | <u>Yes</u>        | <u>FAC</u>       |   |                   |              |                      |                |                        |                 |                        |                  |                       |                |                      |                |                               |                |
| 3. _____  | _____            | _____             | _____            |   |                   |              |                      |                |                        |                 |                        |                  |                       |                |                      |                |                               |                |
| 4. _____  | _____            | _____             | _____            |   |                   |              |                      |                |                        |                 |                        |                  |                       |                |                      |                |                               |                |
| 5. _____  | _____            | _____             | _____            |   |                   |              |                      |                |                        |                 |                        |                  |                       |                |                      |                |                               |                |
| 6. _____  | _____            | _____             | _____            |   |                   |              |                      |                |                        |                 |                        |                  |                       |                |                      |                |                               |                |
| 7. _____  | _____            | _____             | _____            |   |                   |              |                      |                |                        |                 |                        |                  |                       |                |                      |                |                               |                |
| 8. _____  | _____            | _____             | _____            |   |                   |              |                      |                |                        |                 |                        |                  |                       |                |                      |                |                               |                |
| 9. _____  | _____            | _____             | _____            |   |                   |              |                      |                |                        |                 |                        |                  |                       |                |                      |                |                               |                |
| 10. _____   | _____            | _____             | _____            |   |                   |              |                      |                |                        |                 |                        |                  |                       |                |                      |                |                               |                |
| 11. _____   | <u>100</u>       | = Total Cover     |                  |   |                   |              |                      |                |                        |                 |                        |                  |                       |                |                      |                |                               |                |
| <b>Woody Vine Stratum</b> (Plot size: <u>30 ft</u> )    |                  |                   |                  |   |                   |              |                      |                |                        |                 |                        |                  |                       |                |                      |                |                               |                |
| 1. _____  | _____            | _____             | _____            | <b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>  |                   |              |                      |                |                        |                 |                        |                  |                       |                |                      |                |                               |                |
| 2. _____  | _____            | _____             | _____            |   |                   |              |                      |                |                        |                 |                        |                  |                       |                |                      |                |                               |                |
| % Bare Ground in Herb Stratum <u>0</u>                  |                  |                   |                  |   |                   |              |                      |                |                        |                 |                        |                  |                       |                |                      |                |                               |                |

Remarks: **Hydrophytic vegetation criterion observed through dominance test indicator.**



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

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 03/02/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-32  
 Investigator(s): Emily Swaim, Richard Peel Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): Concave Slope (%): 0  
 Subregion (LRR): A-2 Lat: 48.145137 Long: -122.16882319 Datum: WGS 84  
 Soil Map Unit Name: Norma 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 , Soil , or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |  |
|---|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | <b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks: <b>Not all three wetland criteria observed, hydrophytic vegetation present. Non-wetland hydrology confirmed by groundwater monitoring study.</b>   |  |

**VEGETATION – Use scientific names of plants.**

| <u>Tree Stratum</u> (Plot size: <u>30 ft</u> )          | <u>Absolute % Cover</u> | <u>Dominant Species?</u> | <u>Indicator Status</u> |                         |
|---|-------------------------|--------------------------|-------------------------|-------------------------|
| 1. _____  | _____                   | _____                    | _____                   |                         |
| 2. _____  | _____                   | _____                    | _____                   |                         |
| 3. _____  | _____                   | _____                    | _____                   |                         |
| 4. _____  | _____                   | _____                    | _____                   |                         |
|   |                         |                          |                         | <u>0</u> = Total Cover  |
| <u>Sapling/Shrub Stratum</u> (Plot size: <u>15 ft</u> ) |                         |                          |                         |                         |
| 1. _____  | _____                   | _____                    | _____                   |                         |
| 2. _____  | _____                   | _____                    | _____                   |                         |
| 3. _____  | _____                   | _____                    | _____                   |                         |
| 4. _____  | _____                   | _____                    | _____                   |                         |
| 5. _____  | _____                   | _____                    | _____                   |                         |
|   |                         |                          |                         | <u>0</u> = Total Cover  |
| <u>Herb Stratum</u> (Plot size: <u>5 ft</u> )           |                         |                          |                         |                         |
| 1. <u>Holcus lanatus</u>                                | <u>30</u>               | <u>Yes</u>               | <u>FAC</u>              |                         |
| 2. <u>Juncus effusus</u>                                | <u>20</u>               | <u>Yes</u>               | <u>FACW</u>             |                         |
| 3. <u>Rubus armeniacus</u>                              | <u>10</u>               | <u>No</u>                | <u>FAC</u>              |                         |
| 4. _____  | _____                   | _____                    | _____                   |                         |
| 5. _____  | _____                   | _____                    | _____                   |                         |
| 6. _____  | _____                   | _____                    | _____                   |                         |
| 7. _____  | _____                   | _____                    | _____                   |                         |
| 8. _____  | _____                   | _____                    | _____                   |                         |
| 9. _____  | _____                   | _____                    | _____                   |                         |
| 10. _____   | _____                   | _____                    | _____                   |                         |
| 11. _____   | _____                   | _____                    | _____                   |                         |
|   |                         |                          |                         | <u>60</u> = Total Cover |
| <u>Woody Vine Stratum</u> (Plot size: <u>30 ft</u> )    |                         |                          |                         |                         |
| 1. _____  | _____                   | _____                    | _____                   |                         |
| 2. _____  | _____                   | _____                    | _____                   |                         |
|   |                         |                          |                         | <u>0</u> = Total Cover  |
| <u>% Bare Ground in Herb Stratum</u> <u>40</u>          |                         |                          |                         |                         |

**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:**  
 Rapid Test for Hydrophytic Vegetation  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes  No

Remarks: **Hydrophytic vegetation criterion observed through dominance test indicator.**



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

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 03/02/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-33  
 Investigator(s): Emily Swaim, Richard Peel Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): None Slope (%): 0  
 Subregion (LRR): A-2 Lat: 48.146165 Long: -122.16954340 Datum: WGS 84  
 Soil Map Unit Name: Norma 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 \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |  |
|---|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | <b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| Remarks: <b>Wetland F plot. All three wetland criteria observed. Wetland hydrology confirmed by groundwater monitoring study.</b>   |  |

**VEGETATION – Use scientific names of plants.**

| <u>Tree Stratum</u> (Plot size: <u>30 ft</u> )          | <u>Absolute % Cover</u> | <u>Dominant Species?</u> | <u>Indicator Status</u> |                   |
|---|-------------------------|--------------------------|-------------------------|-------------------|
| 1. _____  | _____                   | _____                    | _____                   |                   |
| 2. _____  | _____                   | _____                    | _____                   |                   |
| 3. _____  | _____                   | _____                    | _____                   |                   |
| 4. _____  | _____                   | _____                    | _____                   |                   |
|   |                         |                          |                         | 0 = Total Cover   |
| <u>Sapling/Shrub Stratum</u> (Plot size: <u>15 ft</u> ) |                         |                          |                         |                   |
| 1. <u>Rubus armeniacus</u>                              | <u>25</u>               | <u>Yes</u>               | <u>FAC</u>              |                   |
| 2. _____  | _____                   | _____                    | _____                   |                   |
| 3. _____  | _____                   | _____                    | _____                   |                   |
| 4. _____  | _____                   | _____                    | _____                   |                   |
| 5. _____  | _____                   | _____                    | _____                   |                   |
|   |                         |                          |                         | 25 = Total Cover  |
| <u>Herb Stratum</u> (Plot size: <u>5 ft</u> )           |                         |                          |                         |                   |
| 1. <u>Holcus lanatus</u>                                | <u>90</u>               | <u>Yes</u>               | <u>FAC</u>              |                   |
| 2. <u>Vicia americana</u>                               | <u>5</u>                | <u>No</u>                | <u>FAC</u>              |                   |
| 3. <u>Arctostaphylos uva-ursi</u>                       | <u>3</u>                | <u>No</u>                | <u>FACU</u>             |                   |
| 4. <u>Lotus corniculatus</u>                            | <u>2</u>                | <u>No</u>                | <u>FAC</u>              |                   |
| 5. _____  | _____                   | _____                    | _____                   |                   |
| 6. _____  | _____                   | _____                    | _____                   |                   |
| 7. _____  | _____                   | _____                    | _____                   |                   |
| 8. _____  | _____                   | _____                    | _____                   |                   |
| 9. _____  | _____                   | _____                    | _____                   |                   |
| 10. _____   | _____                   | _____                    | _____                   |                   |
| 11. _____   | _____                   | _____                    | _____                   |                   |
|   |                         |                          |                         | 100 = Total Cover |
| <u>Woody Vine Stratum</u> (Plot size: <u>30 ft</u> )    |                         |                          |                         |                   |
| 1. _____  | _____                   | _____                    | _____                   |                   |
| 2. _____  | _____                   | _____                    | _____                   |                   |
|   |                         |                          |                         | 0 = Total Cover   |
| % Bare Ground in Herb Stratum <u>0</u>                  |                         |                          |                         |                   |

**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:**  
 Rapid Test for Hydrophytic Vegetation  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes  No

Remarks: **Hydrophytic vegetation criterion observed through dominance test indicator.**



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

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 03/02/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-34  
 Investigator(s): Richard Peel, Emily Swaim Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): Concave Slope (%): 0  
 Subregion (LRR): A2 Lat: 48.1456455383417 Long: -122.1667767688 Datum: WGS 84  
 Soil Map Unit Name: Custer fine 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 , Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |   |
|---|---|
| Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | <b>Is the Sampled Area<br/>within a Wetland?</b><br>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks: <u>No wetland criteria observed; mowed Himalayan blackberry. Non-wetland hydrology confirmed by groundwater monitoring study.</u>  |   |

### VEGETATION – Use scientific names of plants.

| <u>Tree Stratum</u> (Plot size: <u>30 ft</u> )          | Absolute % Cover | Dominant Species? | Indicator Status |                        |
|---|------------------|-------------------|------------------|------------------------|
| 1. _____  | _____            | _____             | _____            |                        |
| 2. _____  | _____            | _____             | _____            |                        |
| 3. _____  | _____            | _____             | _____            |                        |
| 4. _____  | _____            | _____             | _____            |                        |
|   |                  |                   |                  | <u>0</u> = Total Cover |
| <u>Sapling/Shrub Stratum</u> (Plot size: <u>15 ft</u> ) |                  |                   |                  |                        |
| 1. _____  | _____            | _____             | _____            |                        |
| 2. _____  | _____            | _____             | _____            |                        |
| 3. _____  | _____            | _____             | _____            |                        |
| 4. _____  | _____            | _____             | _____            |                        |
| 5. _____  | _____            | _____             | _____            |                        |
|   |                  |                   |                  | <u>0</u> = Total Cover |
| <u>Herb Stratum</u> (Plot size: <u>5 ft</u> )           |                  |                   |                  |                        |
| 1. _____  | _____            | _____             | _____            |                        |
| 2. _____  | _____            | _____             | _____            |                        |
| 3. _____  | _____            | _____             | _____            |                        |
| 4. _____  | _____            | _____             | _____            |                        |
| 5. _____  | _____            | _____             | _____            |                        |
| 6. _____  | _____            | _____             | _____            |                        |
| 7. _____  | _____            | _____             | _____            |                        |
| 8. _____  | _____            | _____             | _____            |                        |
| 9. _____  | _____            | _____             | _____            |                        |
| 10. _____   | _____            | _____             | _____            |                        |
| 11. _____   | _____            | _____             | _____            |                        |
|   |                  |                   |                  | <u>0</u> = Total Cover |
| <u>Woody Vine Stratum</u> (Plot size: <u>30 ft</u> )    |                  |                   |                  |                        |
| 1. _____  | _____            | _____             | _____            |                        |
| 2. _____  | _____            | _____             | _____            |                        |
|   |                  |                   |                  | <u>0</u> = Total Cover |
| % Bare Ground in Herb Stratum <u>100</u>                |                  |                   |                  |                        |

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)  
 Total Number of Dominant Species Across All Strata: 0 (B)  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

**Prevalence Index worksheet:**  
 Total % Cover of: \_\_\_\_\_ Multiply by:  
 OBL species 0 x 1 = 0  
 FACW species 0 x 2 = 0  
 FAC species 0 x 3 = 0  
 FACU species 0 x 4 = 0  
 UPL species 0 x 5 = 0  
 Column Totals: 0 (A) 0 (B)  
 Prevalence Index = B/A = \_\_\_\_\_

**Hydrophytic Vegetation Indicators:**  
 Rapid Test for Hydrophytic Vegetation  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes  No

Remarks: No hydrophytic vegetation indicators observed.



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

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 03/02/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-37  
 Investigator(s): Emily Swaim, Richard Peel Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): None Slope (%): 0  
 Subregion (LRR): A-2 Lat: 48.140324 Long: -122.16446610 Datum: WGS 84  
 Soil Map Unit Name: Custer fine 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 \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation \_\_\_\_\_, Soil , or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |  |
|---|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | <b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks: <b>Not all three wetland criteria observed, hydrophytic vegetation present. Non-wetland hydrology confirmed by groundwater monitoring study.</b>   |  |

**VEGETATION – Use scientific names of plants.**

| <u>Tree Stratum</u> (Plot size: <u>30 ft</u> )          | <u>Absolute % Cover</u>  | <u>Dominant Species?</u> | <u>Indicator Status</u> |                         |
|---|--------------------------|--------------------------|-------------------------|-------------------------|
| 1. _____  | _____                    | _____                    | _____                   |                         |
| 2. _____  | _____                    | _____                    | _____                   |                         |
| 3. _____  | _____                    | _____                    | _____                   |                         |
| 4. _____  | _____                    | _____                    | _____                   |                         |
|   |                          |                          |                         | <u>0</u> = Total Cover  |
| <u>Sapling/Shrub Stratum</u> (Plot size: <u>15 ft</u> ) | 1. _____                 | _____                    | _____                   |                         |
| 2. _____  | _____                    | _____                    | _____                   |                         |
| 3. _____  | _____                    | _____                    | _____                   |                         |
| 4. _____  | _____                    | _____                    | _____                   |                         |
| 5. _____  | _____                    | _____                    | _____                   |                         |
|   |                          |                          |                         | <u>0</u> = Total Cover  |
| <u>Herb Stratum</u> (Plot size: <u>5 ft</u> )           | 1. <u>Holcus lanatus</u> | <u>70</u>                | <u>Yes</u>              | <u>FAC</u>              |
| 2. <u>Little spades weedy</u>                           | <u>25</u>                | <u>Yes</u>               | <u>FAC</u>              |                         |
| 3. _____  | _____                    | _____                    | _____                   |                         |
| 4. _____  | _____                    | _____                    | _____                   |                         |
| 5. _____  | _____                    | _____                    | _____                   |                         |
| 6. _____  | _____                    | _____                    | _____                   |                         |
| 7. _____  | _____                    | _____                    | _____                   |                         |
| 8. _____  | _____                    | _____                    | _____                   |                         |
| 9. _____  | _____                    | _____                    | _____                   |                         |
| 10. _____   | _____                    | _____                    | _____                   |                         |
| 11. _____   | _____                    | _____                    | _____                   |                         |
|   |                          |                          |                         | <u>95</u> = Total Cover |
| <u>Woody Vine Stratum</u> (Plot size: <u>30 ft</u> )    | 1. _____                 | _____                    | _____                   |                         |
| 2. _____  | _____                    | _____                    | _____                   |                         |
|   |                          |                          |                         | <u>0</u> = Total Cover  |
| <u>% Bare Ground in Herb Stratum</u> <u>5</u>           |                          |                          |                         |                         |

**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 95 x 3 = 285  
 FACU species 0 x 4 = 0  
 UPL species 0 x 5 = 0  
 Column Totals: 95 (A) 285 (B)  
 Prevalence Index = B/A = 3

**Hydrophytic Vegetation Indicators:**  
 Rapid Test for Hydrophytic Vegetation  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes  No

Remarks: **Hydrophytic vegetation criterion observed through dominance test indicator; unknown herbaceous plant with small lanceolate leaves: assumed FAC.**



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

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 03/14/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-39  
 Investigator(s): Kyla Caddey, Emily Swaim Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): None Slope (%): 0  
 Subregion (LRR): A-2 Lat: 48.141345 Long: -122.16824084 Datum: WGS 84  
 Soil Map Unit Name: Custer fine 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 \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |   |
|---|---|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | <b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input type="checkbox"/> |
| Remarks: <b>Not all three wetland criteria observed, only hydrophytic vegetation present; turf field. Non-wetland hydrology confirmed by groundwater monitoring study.</b>  |   |

**VEGETATION – Use scientific names of plants.**

| <u>Tree Stratum</u> (Plot size: <u>30 ft</u> )          | <u>Absolute % Cover</u> | <u>Dominant Species?</u> | <u>Indicator Status</u> |  |
|---|-------------------------|--------------------------|-------------------------|--|
| 1. _____  | _____                   | _____                    | _____                   |  |
| 2. _____  | _____                   | _____                    | _____                   |  |
| 3. _____  | _____                   | _____                    | _____                   |  |
| 4. _____  | _____                   | _____                    | _____                   |  |
| <u>0</u> = Total Cover                                  |                         |                          |                         |  |
| <u>Sapling/Shrub Stratum</u> (Plot size: <u>15 ft</u> ) |                         |                          |                         |  |
| 1. _____  | _____                   | _____                    | _____                   |  |
| 2. _____  | _____                   | _____                    | _____                   |  |
| 3. _____  | _____                   | _____                    | _____                   |  |
| 4. _____  | _____                   | _____                    | _____                   |  |
| 5. _____  | _____                   | _____                    | _____                   |  |
| <u>0</u> = Total Cover                                  |                         |                          |                         |  |
| <u>Herb Stratum</u> (Plot size: <u>5 ft</u> )           |                         |                          |                         |  |
| 1. <u>planted grass</u>                                 | <u>100</u>              | <u>Yes</u>               | <u>FAC</u>              |  |
| 2. _____  | _____                   | _____                    | _____                   |  |
| 3. _____  | _____                   | _____                    | _____                   |  |
| 4. _____  | _____                   | _____                    | _____                   |  |
| 5. _____  | _____                   | _____                    | _____                   |  |
| 6. _____  | _____                   | _____                    | _____                   |  |
| 7. _____  | _____                   | _____                    | _____                   |  |
| 8. _____  | _____                   | _____                    | _____                   |  |
| 9. _____  | _____                   | _____                    | _____                   |  |
| 10. _____   | _____                   | _____                    | _____                   |  |
| 11. _____   | _____                   | _____                    | _____                   |  |
| <u>100</u> = Total Cover                                |                         |                          |                         |  |
| <u>Woody Vine Stratum</u> (Plot size: <u>30 ft</u> )    |                         |                          |                         |  |
| 1. _____  | _____                   | _____                    | _____                   |  |
| 2. _____  | _____                   | _____                    | _____                   |  |
| <u>0</u> = Total Cover                                  |                         |                          |                         |  |
| % Bare Ground in Herb Stratum <u>0</u>                  |                         |                          |                         |  |

**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 0 x 2 = 0  
 FAC species 100 x 3 = 300  
 FACU species 0 x 4 = 0  
 UPL species 0 x 5 = 0  
 Column Totals: 100 (A) 300 (B)  
 Prevalence Index = B/A = 3

**Hydrophytic Vegetation Indicators:**  
 Rapid Test for Hydrophytic Vegetation  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes  No

Remarks: **Hydrophytic vegetation criterion observed through dominance test indicator; planted grass**

**SOIL**

Sampling Point: DP-39

| Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) |               |    |                |   |                   |                  |         |         |  |
|---|---------------|----|----------------|---|-------------------|------------------|---------|---------|--|
| Depth (inches)  | Matrix        |    | Redox Features |   |                   | Loc <sup>2</sup> | Texture | Remarks |  |
|   | Color (moist) | %  | Color (moist)  | % | Type <sup>1</sup> |                  |         |         |  |
| 0 - 16  | 10YR 2/2      | 98 | 7.5YR 3/4      | 2 | c                 | m                | SaLo    |         |  |
| 16 - 26   | 5Y 4/3        | 99 | 10YR 5/6       | 1 | cs                | m                | Sand    | coarse  |  |
| 26 - 30   | 5Y 3/2        | 95 | 10YR 5/6       | 5 | cs                | m                | Sand    | coarse  |  |
|   |               |    |                |   |                   |                  |         |         |  |
|   |               |    |                |   |                   |                  |         |         |  |
|   |               |    |                |   |                   |                  |         |         |  |
|   |               |    |                |   |                   |                  |         |         |  |
|   |               |    |                |   |                   |                  |         |         |  |

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

|  |   |   |
|--|---|---|
| <b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b><br><input type="checkbox"/> Histosol (A1)<br><input type="checkbox"/> Histic Epipedon (A2)<br><input type="checkbox"/> Black Histic (A3)<br><input type="checkbox"/> Hydrogen Sulfide (A4)<br><input type="checkbox"/> Depleted Below Dark Surface (A11)<br><input type="checkbox"/> Thick Dark Surface (A12)<br><input type="checkbox"/> Sandy Mucky Mineral (S1)<br><input type="checkbox"/> Sandy Gleyed Matrix (S4) | <input type="checkbox"/> Sandy Redox (S5)<br><input type="checkbox"/> Stripped Matrix (S6)<br><input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)<br><input type="checkbox"/> Loamy Gleyed Matrix (F2)<br><input type="checkbox"/> Depleted Matrix (F3)<br><input type="checkbox"/> Redox Dark Surface (F6)<br><input type="checkbox"/> Depleted Dark Surface (F7)<br><input type="checkbox"/> Redox Depressions (F8) | <b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b><br><input type="checkbox"/> 2 cm Muck (A10)<br><input type="checkbox"/> Red Parent Material (TF2)<br><input type="checkbox"/> Very Shallow Dark Surface (TF12)<br><input type="checkbox"/> Other (Explain in Remarks) |
|--|---|---|

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

|  |   |
|--|---|
| <b>Restrictive Layer (if present):</b><br>Type: _____<br>Depth (inches): _____ | <b>Hydric Soil Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
|--|---|

Remarks:  
No hydric soils indicators observed.

**HYDROLOGY**

|   |   |  |  |
|---|---|--|--|
| <b>Wetland Hydrology Indicators:</b><br>Primary Indicators (minimum of one required; check all that apply)  |   | Secondary Indicators (2 or more required)  |  |
| <input type="checkbox"/> Surface Water (A1)<br><input type="checkbox"/> High Water Table (A2)<br><input type="checkbox"/> Saturation (A3)<br><input type="checkbox"/> Water Marks (B1)<br><input type="checkbox"/> Sediment Deposits (B2)<br><input type="checkbox"/> Drift Deposits (B3)<br><input type="checkbox"/> Algal Mat or Crust (B4)<br><input type="checkbox"/> Iron Deposits (B5)<br><input type="checkbox"/> Surface Soil Cracks (B6)<br><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)<br><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | <input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)<br><input type="checkbox"/> Salt Crust (B11)<br><input type="checkbox"/> Aquatic Invertebrates (B13)<br><input type="checkbox"/> Hydrogen Sulfide Odor (C1)<br><input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)<br><input type="checkbox"/> Presence of Reduced Iron (C4)<br><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)<br><input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)<br><input type="checkbox"/> Other (Explain in Remarks) | <input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)<br><input type="checkbox"/> Drainage Patterns (B10)<br><input type="checkbox"/> Dry-Season Water Table (C2)<br><input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)<br><input type="checkbox"/> Geomorphic Position (D2)<br><input type="checkbox"/> Shallow Aquitard (D3)<br><input type="checkbox"/> FAC-Neutral Test (D5)<br><input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)<br><input type="checkbox"/> Frost-Heave Hummocks (D7) |  |
| <b>Field Observations:</b><br>Surface Water Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____<br>Water Table Present?    Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>26</u><br>Saturation Present?    Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>22</u><br>(includes capillary fringe)   |   | <b>Wetland Hydrology Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>  |  |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:  |   |  |  |
| Remarks:<br>No wetland hydrology indicators observed at time of monitoring well installation on March 14, 2018. Monitoring well installed at monitoring location MP-39 indicated non-wetland hydrology. Monitoring well was observed weekly from March 20 to June 5, 2018.  |   |  |  |

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

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 03/01/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-4  
 Investigator(s): Emily Swaim, Jon Pickett, Richard Peel Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): None Slope (%): 0  
 Subregion (LRR): A-2 Lat: 48.140326 Long: -122.16240866 Datum: WGS 84  
 Soil Map Unit Name: Norma 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 , Soil , or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |  |
|---|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>                       | <b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| Remarks: <u>Hydrophytic vegetation &amp; wetland hydrology present; disked but typical; wetland hydrology confirmed by groundwater monitoring study. The sampled area is considered to be within a wetland due to at least 22 consecutive days of water table elevation at or above 12 inches below ground surface.</u> |  |

### VEGETATION – Use scientific names of plants.

|   | Absolute % Cover | Dominant Species? | Indicator Status |  |
|---|------------------|-------------------|------------------|--|
| <b>Tree Stratum</b> (Plot size: <u>30 ft</u> )          |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| <b>Sapling/Shrub Stratum</b> (Plot size: <u>15 ft</u> ) |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
| 5. _____  | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| <b>Herb Stratum</b> (Plot size: <u>5 ft</u> )           |                  |                   |                  |  |
| 1. <u>Holcus lanatus</u>                                | <u>60</u>        | <u>Yes</u>        | <u>FAC</u>       |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
| 5. _____  | _____            | _____             | _____            |  |
| 6. _____  | _____            | _____             | _____            |  |
| 7. _____  | _____            | _____             | _____            |  |
| 8. _____  | _____            | _____             | _____            |  |
| 9. _____  | _____            | _____             | _____            |  |
| 10. _____   | _____            | _____             | _____            |  |
| 11. _____   | _____            | _____             | _____            |  |
|   | <u>60</u>        | = Total Cover     |                  |  |
| <b>Woody Vine Stratum</b> (Plot size: <u>30 ft</u> )    |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| <b>% Bare Ground in Herb Stratum</b> <u>40</u>          |                  |                   |                  |  |

**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 0 x 2 = 0  
 FAC species 60 x 3 = 180  
 FACU species 0 x 4 = 0  
 UPL species 0 x 5 = 0  
 Column Totals: 60 (A) 180 (B)  
 Prevalence Index = B/A = 3

**Hydrophytic Vegetation Indicators:**  
 Rapid Test for Hydrophytic Vegetation  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes  No

Remarks: Hydrophytic vegetation criterion observed through dominance test indicator.



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

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 03/14/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-40  
 Investigator(s): Emily Swaim, Kyla Caddey Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): None Slope (%): 0  
 Subregion (LRR): A-2 Lat: 48.141371 Long: -122.1692773 Datum: WGS 84  
 Soil Map Unit Name: Custer fine 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 , Soil , or Hydrology  significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology  naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |  |
|---|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | <b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks: <b>Not all three wetland criteria observed, only hydrophytic vegetation present; turf field. Non-wetland hydrology confirmed by groundwater monitoring study.</b>  |  |

**VEGETATION – Use scientific names of plants.**

| <u>Tree Stratum</u> (Plot size: <u>30 ft</u> )          | <u>Absolute % Cover</u> | <u>Dominant Species?</u> | <u>Indicator Status</u> | <b>Dominance Test worksheet:</b>   |
|---|-------------------------|--------------------------|-------------------------|--|
| 1. _____  | _____                   | _____                    | _____                   | Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)<br><br>Total Number of Dominant Species Across All Strata: <u>1</u> (B)<br><br>Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)   |
| 2. _____  | _____                   | _____                    | _____                   |  |
| 3. _____  | _____                   | _____                    | _____                   |  |
| 4. _____  | _____                   | _____                    | _____                   |  |
| <u>0</u> = Total Cover                                  |                         |                          |                         | <b>Prevalence Index worksheet:</b><br>Total % Cover of: _____ Multiply by:<br>OBL species <u>0</u> x 1 = <u>0</u><br>FACW species <u>0</u> x 2 = <u>0</u><br>FAC species <u>100</u> x 3 = <u>300</u><br>FACU species <u>0</u> x 4 = <u>0</u><br>UPL species <u>0</u> x 5 = <u>0</u><br>Column Totals: <u>100</u> (A) <u>300</u> (B)<br><br>Prevalence Index = B/A = <u>3</u> |
| <u>Sapling/Shrub Stratum</u> (Plot size: <u>15 ft</u> ) | <u>Absolute % Cover</u> | <u>Dominant Species?</u> | <u>Indicator Status</u> |  |
| 1. _____  | _____                   | _____                    | _____                   |  |
| 2. _____  | _____                   | _____                    | _____                   |  |
| 3. _____  | _____                   | _____                    | _____                   |  |
| 4. _____  | _____                   | _____                    | _____                   |  |
| 5. _____  | _____                   | _____                    | _____                   |  |
| <u>0</u> = Total Cover                                  |                         |                          |                         |  |
| <u>Herb Stratum</u> (Plot size: <u>5 ft</u> )           | <u>Absolute % Cover</u> | <u>Dominant Species?</u> | <u>Indicator Status</u> |  |
| 1. <u>planted grass</u>                                 | <u>100</u>              | <u>Yes</u>               | <u>FAC</u>              |  |
| 2. _____  | _____                   | _____                    | _____                   |  |
| 3. _____  | _____                   | _____                    | _____                   |  |
| 4. _____  | _____                   | _____                    | _____                   |  |
| 5. _____  | _____                   | _____                    | _____                   |  |
| 6. _____  | _____                   | _____                    | _____                   |  |
| 7. _____  | _____                   | _____                    | _____                   |  |
| 8. _____  | _____                   | _____                    | _____                   |  |
| 9. _____  | _____                   | _____                    | _____                   |  |
| 10. _____   | _____                   | _____                    | _____                   |  |
| 11. _____   | _____                   | _____                    | _____                   |  |
| <u>100</u> = Total Cover                                |                         |                          |                         |  |
| <u>Woody Vine Stratum</u> (Plot size: <u>30 ft</u> )    | <u>Absolute % Cover</u> | <u>Dominant Species?</u> | <u>Indicator Status</u> |  |
| 1. _____  | _____                   | _____                    | _____                   |  |
| 2. _____  | _____                   | _____                    | _____                   |  |
| <u>0</u> = Total Cover                                  |                         |                          |                         |  |
| % Bare Ground in Herb Stratum <u>0</u>                  |                         |                          |                         |  |

**Hydrophytic Vegetation Indicators:**  
 Rapid Test for Hydrophytic Vegetation  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes  No

Remarks: **Hydrophytic vegetation criterion observed through dominance test indicator; unidentified grass species assumed to be facultative for scoring purposes (use when unidentified grass marked in data form); turf field**

**SOIL**

Sampling Point: DP-40

| <b>Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)</b>                             |               |     |   |   |                   |   |         |         |  |  |
|--|---------------|-----|---|---|-------------------|---|---------|---------|--|--|
| Depth<br>(inches)  | Matrix        |     | Redox Features  |   |                   |   | Texture | Remarks |  |  |
|  | Color (moist) | %   | Color (moist)   | % | Type <sup>1</sup> | Loc <sup>2</sup>  |         |         |  |  |
| 0 - 9  | 10YR 3/2      | 100 |   |   |                   |   | SaLo    |         |  |  |
| 9 - 23   | 5Y 5/2        | 95  | 7.5YR 4/6   | 5 | cs                | m   | Sand    | coarse  |  |  |
| 23 - 30  | 5Y 3/1        | 99  | 10YR 5/4  | 1 | cs                | m   | Sand    | coarse  |  |  |
|  |               |     |   |   |                   |   |         |         |  |  |
|  |               |     |   |   |                   |   |         |         |  |  |
|  |               |     |   |   |                   |   |         |         |  |  |
|  |               |     |   |   |                   |   |         |         |  |  |
|  |               |     |   |   |                   |   |         |         |  |  |
|  |               |     |   |   |                   |   |         |         |  |  |
| <sup>1</sup> Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup> Location: PL=Pore Lining, M=Matrix. |               |     |   |   |                   |   |         |         |  |  |
| <b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b>   |               |     |   |   |                   | <b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b>   |         |         |  |  |
| <input type="checkbox"/> Histosol (A1)   |               |     | <input type="checkbox"/> Sandy Redox (S5)                         |   |                   | <input type="checkbox"/> 2 cm Muck (A10)  |         |         |  |  |
| <input type="checkbox"/> Histic Epipedon (A2)  |               |     | <input type="checkbox"/> Stripped Matrix (S6)                     |   |                   | <input type="checkbox"/> Red Parent Material (TF2)  |         |         |  |  |
| <input type="checkbox"/> Black Histic (A3)   |               |     | <input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1) |   |                   | <input type="checkbox"/> Very Shallow Dark Surface (TF12)   |         |         |  |  |
| <input type="checkbox"/> Hydrogen Sulfide (A4)   |               |     | <input type="checkbox"/> Loamy Gleyed Matrix (F2)                 |   |                   | <input type="checkbox"/> Other (Explain in Remarks)   |         |         |  |  |
| <input type="checkbox"/> Depleted Below Dark Surface (A11)   |               |     | <input type="checkbox"/> Depleted Matrix (F3)                     |   |                   | <sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. |         |         |  |  |
| <input type="checkbox"/> Thick Dark Surface (A12)  |               |     | <input type="checkbox"/> Redox Dark Surface (F6)                  |   |                   |   |         |         |  |  |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)  |               |     | <input type="checkbox"/> Depleted Dark Surface (F7)               |   |                   |   |         |         |  |  |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4)  |               |     | <input type="checkbox"/> Redox Depressions (F8)                   |   |                   |   |         |         |  |  |
| <b>Restrictive Layer (if present):</b>   |               |     |   |   |                   |   |         |         |  |  |
| Type: _____  |               |     |   |   |                   | <b>Hydric Soil Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>                           |         |         |  |  |
| Depth (inches): _____  |               |     |   |   |                   |   |         |         |  |  |
| Remarks:<br>No hydric soils indicators observed.   |               |     |   |   |                   |   |         |         |  |  |

**HYDROLOGY**

| <b>Wetland Hydrology Indicators:</b>   |   |                           |  |  |   |  |  |  |  |  |
|--|---|---------------------------|--|--|---|--|--|--|--|--|
| Primary Indicators (minimum of one required; check all that apply)   |   |                           |  |  | Secondary Indicators (2 or more required)   |  |  |  |  |  |
| <input type="checkbox"/> Surface Water (A1)  | <input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) |                           |  |  | <input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)                            |  |  |  |  |  |
| <input type="checkbox"/> High Water Table (A2)   | <input type="checkbox"/> Salt Crust (B11)   |                           |  |  | <input type="checkbox"/> Drainage Patterns (B10)  |  |  |  |  |  |
| <input type="checkbox"/> Saturation (A3)   | <input type="checkbox"/> Aquatic Invertebrates (B13)                              |                           |  |  | <input type="checkbox"/> Dry-Season Water Table (C2)  |  |  |  |  |  |
| <input type="checkbox"/> Water Marks (B1)  | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                               |                           |  |  | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)                                    |  |  |  |  |  |
| <input type="checkbox"/> Sediment Deposits (B2)  | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)            |                           |  |  | <input type="checkbox"/> Geomorphic Position (D2)   |  |  |  |  |  |
| <input type="checkbox"/> Drift Deposits (B3)   | <input type="checkbox"/> Presence of Reduced Iron (C4)                            |                           |  |  | <input type="checkbox"/> Shallow Aquitard (D3)  |  |  |  |  |  |
| <input type="checkbox"/> Algal Mat or Crust (B4)   | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)               |                           |  |  | <input type="checkbox"/> FAC-Neutral Test (D5)  |  |  |  |  |  |
| <input type="checkbox"/> Iron Deposits (B5)  | <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)                  |                           |  |  | <input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)   |  |  |  |  |  |
| <input type="checkbox"/> Surface Soil Cracks (B6)  | <input type="checkbox"/> Other (Explain in Remarks)                               |                           |  |  | <input type="checkbox"/> Frost-Heave Hummocks (D7)  |  |  |  |  |  |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)   |   |                           |  |  |   |  |  |  |  |  |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   |   |                           |  |  |   |  |  |  |  |  |
| <b>Field Observations:</b>   |   |                           |  |  | <b>Wetland Hydrology Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |  |  |  |  |  |
| Surface Water Present?   | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>               | Depth (inches): _____     |  |  |   |  |  |  |  |  |
| Water Table Present?   | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>               | Depth (inches): <u>30</u> |  |  |   |  |  |  |  |  |
| Saturation Present?<br>(includes capillary fringe)   | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>               | Depth (inches): <u>23</u> |  |  |   |  |  |  |  |  |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:   |   |                           |  |  |   |  |  |  |  |  |
| Remarks:<br>No wetland hydrology indicators observed at time of monitoring well installation on March 14, 2018. Monitoring well installed at monitoring location MP-40 indicated wetland hydrology. Monitoring well was observed weekly from March 20 to June 5, 2018. |   |                           |  |  |   |  |  |  |  |  |

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

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 03/14/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-41  
 Investigator(s): Emily Swaim, Kyla Caddey Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): None Slope (%): 0  
 Subregion (LRR): A-2 Lat: 48.141401 Long: -122.17091912 Datum: WGS 84  
 Soil Map Unit Name: Custer fine 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 , Soil , or Hydrology  significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology  naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |   |
|---|---|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | <b>Is the Sampled Area within a Wetland?</b><br>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks: <b>Not all three wetland criteria observed, only hydrophytic vegetation present; turf field. Non-wetland hydrology confirmed by groundwater monitoring study.</b>  |   |

**VEGETATION – Use scientific names of plants.**

| <u>Tree Stratum</u> (Plot size: <u>30 ft</u> ) | <u>Absolute % Cover</u>    | <u>Dominant Species?</u> | <u>Indicator Status</u> |  |
|--|----------------------------|--------------------------|-------------------------|--|
| 1. _____                                       | _____                      | _____                    | _____                   |  |
| 2. _____                                       | _____                      | _____                    | _____                   |  |
| 3. _____                                       | _____                      | _____                    | _____                   |  |
| 4. _____                                       | _____                      | _____                    | _____                   |  |
| <u>0</u> = Total Cover                         |                            |                          |                         |  |
| Sapling/Shrub Stratum                          | (Plot size: <u>15 ft</u> ) |                          |                         |  |
| 1. _____                                       | _____                      | _____                    | _____                   |  |
| 2. _____                                       | _____                      | _____                    | _____                   |  |
| 3. _____                                       | _____                      | _____                    | _____                   |  |
| 4. _____                                       | _____                      | _____                    | _____                   |  |
| 5. _____                                       | _____                      | _____                    | _____                   |  |
| <u>0</u> = Total Cover                         |                            |                          |                         |  |
| Herb Stratum                                   | (Plot size: <u>5 ft</u> )  |                          |                         |  |
| 1. <u>Planted grass</u>                        | <u>100</u>                 | <u>Yes</u>               | <u>FAC</u>              |  |
| 2. _____                                       | _____                      | _____                    | _____                   |  |
| 3. _____                                       | _____                      | _____                    | _____                   |  |
| 4. _____                                       | _____                      | _____                    | _____                   |  |
| 5. _____                                       | _____                      | _____                    | _____                   |  |
| 6. _____                                       | _____                      | _____                    | _____                   |  |
| 7. _____                                       | _____                      | _____                    | _____                   |  |
| 8. _____                                       | _____                      | _____                    | _____                   |  |
| 9. _____                                       | _____                      | _____                    | _____                   |  |
| 10. _____                                      | _____                      | _____                    | _____                   |  |
| 11. _____                                      | _____                      | _____                    | _____                   |  |
| <u>100</u> = Total Cover                       |                            |                          |                         |  |
| Woody Vine Stratum                             | (Plot size: <u>30 ft</u> ) |                          |                         |  |
| 1. _____                                       | _____                      | _____                    | _____                   |  |
| 2. _____                                       | _____                      | _____                    | _____                   |  |
| <u>0</u> = Total Cover                         |                            |                          |                         |  |
| % Bare Ground in Herb Stratum <u>0</u>         |                            |                          |                         |  |

**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 0 x 2 = 0  
 FAC species 100 x 3 = 300  
 FACU species 0 x 4 = 0  
 UPL species 0 x 5 = 0  
 Column Totals: 100 (A) 300 (B)  
 Prevalence Index = B/A = 3

**Hydrophytic Vegetation Indicators:**  
 Rapid Test for Hydrophytic Vegetation  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes  No

Remarks: **Hydrophytic vegetation criterion observed through dominance test indicator; unidentified grass species assumed to be facultative for scoring purposes (use when unidentified grass marked in data form); turf field**

**SOIL**

Sampling Point: DP-41

| <b>Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)</b>                             |               |     |   |   |                   |   |         |                 |
|--|---------------|-----|---|---|-------------------|---|---------|-----------------|
| Depth<br>(inches)  | Matrix        |     | Redox Features  |   |                   | Loc <sup>2</sup>  | Texture | Remarks         |
|  | Color (moist) | %   | Color (moist)   | % | Type <sup>1</sup> |   |         |                 |
| 0 - 16   | 10YR 2/2      | 98  | 7.5YR 4/4   | 2 | CS                |   | SaLo    |                 |
| 16 - 27  | 10YR 3/2      | 100 |   |   |                   |   | Sand    | Coarse sand     |
| 27 - 30  | 5Y 5/2        | 95  | 7.5YR 5/6   | 5 | CS                | M, PL   | SaLo    | Very sandy loam |
|  |               |     |   |   |                   |   |         |                 |
|  |               |     |   |   |                   |   |         |                 |
|  |               |     |   |   |                   |   |         |                 |
|  |               |     |   |   |                   |   |         |                 |
| <sup>1</sup> Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup> Location: PL=Pore Lining, M=Matrix. |               |     |   |   |                   |   |         |                 |
| <b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b>   |               |     |   |   |                   | <b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b>   |         |                 |
| <input type="checkbox"/> Histosol (A1)   |               |     | <input type="checkbox"/> Sandy Redox (S5)                         |   |                   | <input type="checkbox"/> 2 cm Muck (A10)  |         |                 |
| <input type="checkbox"/> Histic Epipedon (A2)  |               |     | <input type="checkbox"/> Stripped Matrix (S6)                     |   |                   | <input type="checkbox"/> Red Parent Material (TF2)  |         |                 |
| <input type="checkbox"/> Black Histic (A3)   |               |     | <input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1) |   |                   | <input type="checkbox"/> Very Shallow Dark Surface (TF12)   |         |                 |
| <input type="checkbox"/> Hydrogen Sulfide (A4)   |               |     | <input type="checkbox"/> Loamy Gleyed Matrix (F2)                 |   |                   | <input type="checkbox"/> Other (Explain in Remarks)   |         |                 |
| <input type="checkbox"/> Depleted Below Dark Surface (A11)   |               |     | <input type="checkbox"/> Depleted Matrix (F3)                     |   |                   | <sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. |         |                 |
| <input type="checkbox"/> Thick Dark Surface (A12)  |               |     | <input type="checkbox"/> Redox Dark Surface (F6)                  |   |                   |   |         |                 |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)  |               |     | <input type="checkbox"/> Depleted Dark Surface (F7)               |   |                   |   |         |                 |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4)  |               |     | <input type="checkbox"/> Redox Depressions (F8)                   |   |                   |   |         |                 |
| <b>Restrictive Layer (if present):</b>   |               |     |   |   |                   | <b>Hydric Soil Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>                           |         |                 |
| Type: _____  |               |     |   |   |                   |   |         |                 |
| Depth (inches): _____  |               |     |   |   |                   |   |         |                 |
| Remarks:<br>No hydric soils indicators observed.   |               |     |   |   |                   |   |         |                 |

**HYDROLOGY**

| <b>Wetland Hydrology Indicators:</b>   |   |   |  |
|--|---|---|--|
| Primary Indicators (minimum of one required; check all that apply)   |   | Secondary Indicators (2 or more required)   |  |
| <input type="checkbox"/> Surface Water (A1)  | <input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) | <input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)                            |  |
| <input type="checkbox"/> High Water Table (A2)   | <input type="checkbox"/> Salt Crust (B11)   | <input type="checkbox"/> Drainage Patterns (B10)  |  |
| <input type="checkbox"/> Saturation (A3)   | <input type="checkbox"/> Aquatic Invertebrates (B13)                              | <input type="checkbox"/> Dry-Season Water Table (C2)  |  |
| <input type="checkbox"/> Water Marks (B1)  | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                               | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)                                    |  |
| <input type="checkbox"/> Sediment Deposits (B2)  | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)            | <input type="checkbox"/> Geomorphic Position (D2)   |  |
| <input type="checkbox"/> Drift Deposits (B3)   | <input type="checkbox"/> Presence of Reduced Iron (C4)                            | <input type="checkbox"/> Shallow Aquitard (D3)  |  |
| <input type="checkbox"/> Algal Mat or Crust (B4)   | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)               | <input type="checkbox"/> FAC-Neutral Test (D5)  |  |
| <input type="checkbox"/> Iron Deposits (B5)  | <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)                  | <input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)   |  |
| <input type="checkbox"/> Surface Soil Cracks (B6)  | <input type="checkbox"/> Other (Explain in Remarks)                               | <input type="checkbox"/> Frost-Heave Hummocks (D7)  |  |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)   |   |   |  |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   |   |   |  |
| <b>Field Observations:</b>   |   | <b>Wetland Hydrology Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |  |
| Surface Water Present?   | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>               | Depth (inches): _____   |  |
| Water Table Present?   | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>               | Depth (inches): <u>30</u>   |  |
| Saturation Present?<br>(includes capillary fringe)   | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>               | Depth (inches): <u>26</u>   |  |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:   |   |   |  |
| Remarks:<br>No wetland hydrology indicators observed at time of monitoring well installation on March 14, 2018. Monitoring well installed at monitoring location MP-41 indicated non-wetland hydrology. Monitoring well was observed weekly from March 20 to June 5, 2018. |   |   |  |

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

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 03/14/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-42  
 Investigator(s): Emily Swaim, Kyla Caddey Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): None Slope (%): 0  
 Subregion (LRR): A-2 Lat: 48.14313905 Long: -122.16961615 Datum: WGS 84  
 Soil Map Unit Name: Norma 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 \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |   |
|---|---|
| Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | <b>Is the Sampled Area<br/>within a Wetland?</b><br>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks: <b>Not all three wetland criteria observed, hydric soil present; flat field area (not planted grass). Non-wetland hydrology confirmed by groundwater monitoring study.</b>   |   |

### VEGETATION – Use scientific names of plants.

| <u>Tree Stratum</u> (Plot size: <u>30 ft</u> )          | Absolute % Cover | Dominant Species? | Indicator Status |  |
|---|------------------|-------------------|------------------|--|
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
| <u>0</u> = Total Cover                                  |                  |                   |                  |  |
| <u>Sapling/Shrub Stratum</u> (Plot size: <u>15 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
| 5. _____  | _____            | _____             | _____            |  |
| <u>0</u> = Total Cover                                  |                  |                   |                  |  |
| <u>Herb Stratum</u> (Plot size: <u>5 ft</u> )           | Absolute % Cover | Dominant Species? | Indicator Status |  |
| 1. <u>Trifolium repens</u>                              | <u>50</u>        | <u>Yes</u>        | <u>FAC</u>       |  |
| 2. <u>Taraxacum officinale</u>                          | <u>20</u>        | <u>Yes</u>        | <u>FACU</u>      |  |
| 3. <u>unidentified grass spp.</u>                       | <u>15</u>        | <u>No</u>         | <u>FAC</u>       |  |
| 4. <u>Holcus lanatus</u>                                | <u>10</u>        | <u>No</u>         | <u>FAC</u>       |  |
| 5. <u>Cardamine oligosperma</u>                         | <u>5</u>         | <u>No</u>         | <u>FAC</u>       |  |
| 6. _____  | _____            | _____             | _____            |  |
| 7. _____  | _____            | _____             | _____            |  |
| 8. _____  | _____            | _____             | _____            |  |
| 9. _____  | _____            | _____             | _____            |  |
| 10. _____   | _____            | _____             | _____            |  |
| 11. _____   | _____            | _____             | _____            |  |
| <u>100</u> = Total Cover                                |                  |                   |                  |  |
| <u>Woody Vine Stratum</u> (Plot size: <u>30 ft</u> )    | Absolute % Cover | Dominant Species? | Indicator Status |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
| <u>0</u> = Total Cover                                  |                  |                   |                  |  |
| % Bare Ground in Herb Stratum <u>0</u>                  |                  |                   |                  |  |

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)  
 Total Number of Dominant Species Across All Strata: 2 (B)  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

**Prevalence Index worksheet:**  
 Total % Cover of: \_\_\_\_\_ Multiply by:  
 OBL species 0 x 1 = 0  
 FACW species 0 x 2 = 0  
 FAC species 80 x 3 = 240  
 FACU species 20 x 4 = 80  
 UPL species 0 x 5 = 0  
 Column Totals: 100 (A) 320 (B)  
 Prevalence Index = B/A = 3.2

**Hydrophytic Vegetation Indicators:**  
 Rapid Test for Hydrophytic Vegetation  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

|  |   |
|--|---|
| <b>Hydrophytic Vegetation Present?</b> | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
|--|---|

Remarks: **No hydrophytic vegetation indicators observed.**



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

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 06/19/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-43  
 Investigator(s): Kyla Caddey, Emily Swaim Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): None Slope (%): 0  
 Subregion (LRR): A-2 Lat: 48.14106776 Long: -122.16329563 Datum: WGS 84  
 Soil Map Unit Name: Custer fine 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 , Soil , or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |  |
|---|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | <b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks:<br><p align="center"><b>Not all three wetland criteria observed, only hydrophytic vegetation present; agriculture field</b></p>  |  |

**VEGETATION – Use scientific names of plants.**

| <u>Tree Stratum</u> (Plot size: <u>30 ft</u> )          | Absolute % Cover | Dominant Species? | Indicator Status |                         |
|---|------------------|-------------------|------------------|-------------------------|
| 1. _____  | _____            | _____             | _____            |                         |
| 2. _____  | _____            | _____             | _____            |                         |
| 3. _____  | _____            | _____             | _____            |                         |
| 4. _____  | _____            | _____             | _____            |                         |
|   |                  |                   |                  | <u>0</u> = Total Cover  |
| <u>Sapling/Shrub Stratum</u> (Plot size: <u>15 ft</u> ) |                  |                   |                  |                         |
| 1. _____  | _____            | _____             | _____            |                         |
| 2. _____  | _____            | _____             | _____            |                         |
| 3. _____  | _____            | _____             | _____            |                         |
| 4. _____  | _____            | _____             | _____            |                         |
| 5. _____  | _____            | _____             | _____            |                         |
|   |                  |                   |                  | <u>0</u> = Total Cover  |
| <u>Herb Stratum</u> (Plot size: <u>5 ft</u> )           |                  |                   |                  |                         |
| 1. <u>Holcus lanatus</u>                                | <u>70</u>        | <u>Yes</u>        | <u>FAC</u>       |                         |
| 2. <u>Chamaenerion angustifolium</u>                    | <u>5</u>         | <u>No</u>         | <u>FACU</u>      |                         |
| 3. _____  | _____            | _____             | _____            |                         |
| 4. _____  | _____            | _____             | _____            |                         |
| 5. _____  | _____            | _____             | _____            |                         |
| 6. _____  | _____            | _____             | _____            |                         |
| 7. _____  | _____            | _____             | _____            |                         |
| 8. _____  | _____            | _____             | _____            |                         |
| 9. _____  | _____            | _____             | _____            |                         |
| 10. _____   | _____            | _____             | _____            |                         |
| 11. _____   | _____            | _____             | _____            |                         |
|   |                  |                   |                  | <u>75</u> = Total Cover |
| <u>Woody Vine Stratum</u> (Plot size: <u>30 ft</u> )    |                  |                   |                  |                         |
| 1. _____  | _____            | _____             | _____            |                         |
| 2. _____  | _____            | _____             | _____            |                         |
|   |                  |                   |                  | <u>0</u> = Total Cover  |
| % Bare Ground in Herb Stratum <u>25</u>                 |                  |                   |                  |                         |

**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:**  
 Rapid Test for Hydrophytic Vegetation  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes  No

Remarks: Hydrophytic vegetation criterion observed through dominance test indicator.

**SOIL**

Sampling Point: DP-43

| <b>Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)</b> |               |     |                |    |                   |                  |         |         |
|--|---------------|-----|----------------|----|-------------------|------------------|---------|---------|
| Depth<br>(inches)  | Matrix        |     | Redox Features |    |                   | Loc <sup>2</sup> | Texture | Remarks |
|  | Color (moist) | %   | Color (moist)  | %  | Type <sup>1</sup> |                  |         |         |
| 0 - 14   | 10YR 3/2      | 100 | /              |    |                   |                  | SaLo    |         |
| 14 - 18  | 5Y 5/3        | 80  | 7.5YR 5/8      | 20 | C, C <sub>s</sub> | M                | Sand    |         |
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## WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 06/19/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-44  
 Investigator(s): Emily Swaim, Kyla Caddey Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): None Slope (%): 1  
 Subregion (LRR): A-2 Lat: 48.13926159 Long: -122.1627159 Datum: WGS 84  
 Soil Map Unit Name: Norma 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 \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |   |
|---|---|
| Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | <b>Is the Sampled Area<br/>within a Wetland?</b><br>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks:<br><p style="text-align: center; font-weight: bold;">No wetland criteria observed.</p>   |   |

### VEGETATION – Use scientific names of plants.

| <u>Tree Stratum</u> (Plot size: <u>30 ft</u> )          | Absolute % Cover | Dominant Species? | Indicator Status |  |
|---|------------------|-------------------|------------------|--|
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
| <u>0</u> = Total Cover                                  |                  |                   |                  |  |
| <u>Sapling/Shrub Stratum</u> (Plot size: <u>15 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
| 5. _____  | _____            | _____             | _____            |  |
| <u>0</u> = Total Cover                                  |                  |                   |                  |  |
| <u>Herb Stratum</u> (Plot size: <u>5 ft</u> )           | Absolute % Cover | Dominant Species? | Indicator Status |  |
| 1. <u>Dactylis glomerata</u>                            | <u>50</u>        | <u>Yes</u>        | <u>FACU</u>      |  |
| 2. <u>Agrostis capillaris</u>                           | <u>20</u>        | <u>Yes</u>        | <u>FAC</u>       |  |
| 3. <u>Pheum pratense</u>                                | <u>15</u>        | <u>No</u>         | <u>FAC</u>       |  |
| 4. <u>Holcus lanatus</u>                                | <u>10</u>        | <u>No</u>         | <u>FAC</u>       |  |
| 5. <u>Plantago major</u>                                | <u>5</u>         | <u>No</u>         | <u>FAC</u>       |  |
| 6. _____  | _____            | _____             | _____            |  |
| 7. _____  | _____            | _____             | _____            |  |
| 8. _____  | _____            | _____             | _____            |  |
| 9. _____  | _____            | _____             | _____            |  |
| 10. _____   | _____            | _____             | _____            |  |
| 11. _____   | _____            | _____             | _____            |  |
| <u>100</u> = Total Cover                                |                  |                   |                  |  |
| <u>Woody Vine Stratum</u> (Plot size: <u>30 ft</u> )    | Absolute % Cover | Dominant Species? | Indicator Status |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
| <u>0</u> = Total Cover                                  |                  |                   |                  |  |
| % Bare Ground in Herb Stratum <u>0</u>                  |                  |                   |                  |  |

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)  
 Total Number of Dominant Species Across All Strata: 2 (B)  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

**Prevalence Index worksheet:**  
 Total % Cover of: \_\_\_\_\_ Multiply by:  
 OBL species 0 x 1 = 0  
 FACW species 0 x 2 = 0  
 FAC species 50 x 3 = 150  
 FACU species 50 x 4 = 200  
 UPL species 0 x 5 = 0  
 Column Totals: NaN (A) NaN (B)  
 Prevalence Index = B/A = NaN

**Hydrophytic Vegetation Indicators:**  
 Rapid Test for Hydrophytic Vegetation  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes  No

Remarks: No hydric soils indicators observed.

**SOIL**

Sampling Point: DP-44

| <b>Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)</b> |               |    |                |   |                   |                  |         |         |
|--|---------------|----|----------------|---|-------------------|------------------|---------|---------|
| Depth<br>(inches)  | Matrix        |    | Redox Features |   |                   | Loc <sup>2</sup> | Texture | Remarks |
|  | Color (moist) | %  | Color (moist)  | % | Type <sup>1</sup> |                  |         |         |
| 0 - 12   | 10YR 3/2      | 99 | 10YR 3/6       | 1 | C                 | M                | SaLo    |         |
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**WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region**

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 06/19/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-45  
 Investigator(s): Emily Swaim, Kyla Caddey Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): Convex Slope (%): 1  
 Subregion (LRR): A-2 Lat: 48.13907023 Long: -122.16244126 Datum: WGS 84  
 Soil Map Unit Name: Norma 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 , Soil , or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |  |
|---|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | <b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| Remarks:<br><p align="center"><b>Wetland B plot. All three wetland criteria observed; agricultural field</b></p>  |  |

**VEGETATION – Use scientific names of plants.**

| <u>Tree Stratum</u> (Plot size: <u>30 ft</u> )          | Absolute % Cover | Dominant Species? | Indicator Status |                         |
|---|------------------|-------------------|------------------|-------------------------|
| 1. _____  | _____            | _____             | _____            |                         |
| 2. _____  | _____            | _____             | _____            |                         |
| 3. _____  | _____            | _____             | _____            |                         |
| 4. _____  | _____            | _____             | _____            |                         |
|   |                  |                   |                  | <u>0</u> = Total Cover  |
| <u>Sapling/Shrub Stratum</u> (Plot size: <u>15 ft</u> ) |                  |                   |                  |                         |
| 1. _____  | _____            | _____             | _____            |                         |
| 2. _____  | _____            | _____             | _____            |                         |
| 3. _____  | _____            | _____             | _____            |                         |
| 4. _____  | _____            | _____             | _____            |                         |
| 5. _____  | _____            | _____             | _____            |                         |
|   |                  |                   |                  | <u>0</u> = Total Cover  |
| <u>Herb Stratum</u> (Plot size: <u>5 ft</u> )           |                  |                   |                  |                         |
| 1. <u>unidentified rye grass</u>                        | <u>10</u>        | <u>Yes</u>        | <u>FAC</u>       |                         |
| 2. <u>Equisetum arvense</u>                             | <u>10</u>        | <u>Yes</u>        | <u>FAC</u>       |                         |
| 3. _____  | _____            | _____             | _____            |                         |
| 4. _____  | _____            | _____             | _____            |                         |
| 5. _____  | _____            | _____             | _____            |                         |
| 6. _____  | _____            | _____             | _____            |                         |
| 7. _____  | _____            | _____             | _____            |                         |
| 8. _____  | _____            | _____             | _____            |                         |
| 9. _____  | _____            | _____             | _____            |                         |
| 10. _____   | _____            | _____             | _____            |                         |
| 11. _____   | _____            | _____             | _____            |                         |
|   |                  |                   |                  | <u>20</u> = Total Cover |
| <u>Woody Vine Stratum</u> (Plot size: <u>30 ft</u> )    |                  |                   |                  |                         |
| 1. _____  | _____            | _____             | _____            |                         |
| 2. _____  | _____            | _____             | _____            |                         |
|   |                  |                   |                  | <u>0</u> = Total Cover  |
| % Bare Ground in Herb Stratum <u>80</u>                 |                  |                   |                  |                         |

**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:**  
 Rapid Test for Hydrophytic Vegetation  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes  No

Remarks: Hydrophytic vegetation criterion observed through dominance test indicator; Unidentified rye grass species assumed to be facultative for scoring purposes (use when unidentified grass marked in data form).

**SOIL**

Sampling Point: DP-45

| <b>Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)</b> |               |    |                |    |                   |                  |         |         |
|--|---------------|----|----------------|----|-------------------|------------------|---------|---------|
| Depth<br>(inches)  | Matrix        |    | Redox Features |    |                   | Loc <sup>2</sup> | Texture | Remarks |
|  | Color (moist) | %  | Color (moist)  | %  | Type <sup>1</sup> |                  |         |         |
| 0 - 12   | 10YR 3/2      | 95 | 7.5YR 5/8      | 5  | C                 | M, PL            | SaLo    |         |
| 12 - 16  | 6/1           | 50 | 7.5YR 5/8      | 50 | C                 | M                | SaLo    |         |
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## WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 06/19/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-46  
 Investigator(s): Emily Swaim, Kyla Caddey Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): Concave Slope (%): 1  
 Subregion (LRR): A-2 Lat: 48.13852169 Long: -122.16622015 Datum: WGS 84  
 Soil Map Unit Name: Norma 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 , Soil , or Hydrology  significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology  naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |  |
|---|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | <b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks:<br><p style="text-align: center; font-weight: bold;">Not all three wetland criteria observed, only hydrophytic vegetation present; agricultural field</p>  |  |

### VEGETATION – Use scientific names of plants.

|   | Absolute % Cover | Dominant Species? | Indicator Status |  |
|---|------------------|-------------------|------------------|--|
| <b>Tree Stratum</b> (Plot size: <u>30 ft</u> )          |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| <b>Sapling/Shrub Stratum</b> (Plot size: <u>15 ft</u> ) |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
| 5. _____  | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| <b>Herb Stratum</b> (Plot size: <u>5 ft</u> )           |                  |                   |                  |  |
| 1. <u>Holcus lanatus</u>                                | <u>50</u>        | <u>Yes</u>        | <u>FAC</u>       |  |
| 2. <u>unidentified grass spp.</u>                       | <u>40</u>        | <u>Yes</u>        | <u>FAC</u>       |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
| 5. _____  | _____            | _____             | _____            |  |
| 6. _____  | _____            | _____             | _____            |  |
| 7. _____  | _____            | _____             | _____            |  |
| 8. _____  | _____            | _____             | _____            |  |
| 9. _____  | _____            | _____             | _____            |  |
| 10. _____   | _____            | _____             | _____            |  |
| 11. _____   | _____            | _____             | _____            |  |
|   | <u>90</u>        | = Total Cover     |                  |  |
| <b>Woody Vine Stratum</b> (Plot size: <u>30 ft</u> )    |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| <b>% Bare Ground in Herb Stratum</b> <u>10</u>          |                  |                   |                  |  |

**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:**  
 Rapid Test for Hydrophytic Vegetation  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes  No

Remarks: Hydrophytic vegetation criterion observed through dominance test indicator; Unidentified grass species assumed to be facultative for scoring purposes (use when unidentified grass marked in data form).



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

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 06/20/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-47  
 Investigator(s): Emily Swaim, Kyla Caddey Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): Concave Slope (%): 2  
 Subregion (LRR): A-2 Lat: 48.13858963 Long: -122.16675481 Datum: WGS 84  
 Soil Map Unit Name: Norma 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 \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |  |
|---|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | <b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| Remarks:<br><p align="center"><b>Wetland C plot. All three wetland criteria observed.</b></p>   |  |

**VEGETATION – Use scientific names of plants.**

|   | Absolute % Cover | Dominant Species? | Indicator Status |   |  |
|---|------------------|-------------------|------------------|---|--|
| <b>Tree Stratum</b> (Plot size: <u>30 ft</u> )          |                  |                   |                  |   |  |
| 1. <u>Alnus rubra</u>                                   | <u>70</u>        | <u>Yes</u>        | <u>FAC</u>       | <b>Dominance Test worksheet:</b><br>Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A)<br><br>Total Number of Dominant Species Across All Strata: <u>5</u> (B)<br><br>Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)  |  |
| 2. <u>Populus balsamifera</u>                           | <u>25</u>        | <u>Yes</u>        | <u>FAC</u>       |   |  |
| 3. _____  | _____            | _____             | _____            |   |  |
| 4. _____  | _____            | _____             | _____            |   |  |
|   | <u>95</u>        | = Total Cover     |                  |   |  |
| <b>Sapling/Shrub Stratum</b> (Plot size: <u>15 ft</u> ) |                  |                   |                  |   |  |
| 1. <u>Lonicera involucrata</u>                          | <u>70</u>        | <u>Yes</u>        | <u>FAC</u>       | <b>Prevalence Index worksheet:</b><br>Total % Cover of: _____ Multiply by:<br>OBL species _____ x 1 = _____<br>FACW species _____ x 2 = _____<br>FAC species _____ x 3 = _____<br>FACU species _____ x 4 = _____<br>UPL species _____ x 5 = _____<br>Column Totals: _____ (A) _____ (B)<br><br>Prevalence Index = B/A = _____ |  |
| 2. <u>Rubus spectabilis</u>                             | <u>10</u>        | <u>No</u>         | <u>FAC</u>       |   |  |
| 3. _____  | _____            | _____             | _____            |   |  |
| 4. _____  | _____            | _____             | _____            |   |  |
| 5. _____  | _____            | _____             | _____            |   |  |
|   | <u>80</u>        | = Total Cover     |                  |   |  |
| <b>Herb Stratum</b> (Plot size: <u>5 ft</u> )           |                  |                   |                  |   |  |
| 1. <u>Athyrium cyclosorum</u>                           | <u>25</u>        | <u>Yes</u>        | <u>FAC</u>       |   |  |
| 2. <u>Carex leporina</u>                                | <u>10</u>        | <u>Yes</u>        | <u>FACW</u>      |   |  |
| 3. _____  | _____            | _____             | _____            |   |  |
| 4. _____  | _____            | _____             | _____            |   |  |
| 5. _____  | _____            | _____             | _____            |   |  |
| 6. _____  | _____            | _____             | _____            |   |  |
| 7. _____  | _____            | _____             | _____            |   |  |
| 8. _____  | _____            | _____             | _____            |   |  |
| 9. _____  | _____            | _____             | _____            |   |  |
| 10. _____   | _____            | _____             | _____            |   |  |
| 11. _____   | _____            | _____             | _____            |   |  |
|   | <u>35</u>        | = Total Cover     |                  |   |  |
| <b>Woody Vine Stratum</b> (Plot size: <u>30 ft</u> )    |                  |                   |                  |   |  |
| 1. _____  | _____            | _____             | _____            |   |  |
| 2. _____  | _____            | _____             | _____            |   |  |
|   | <u>0</u>         | = Total Cover     |                  |   |  |
| % Bare Ground in Herb Stratum <u>65</u>                 |                  |                   |                  |   |  |

Remarks: **Hydrophytic vegetation criteria observed through dominance test, prevalence index, and rapid test for hydrophytic vegetation.**



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

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 06/20/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-48  
 Investigator(s): Emily Swaim, Kyla Caddey Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): Concave Slope (%): 1  
 Subregion (LRR): A-2 Lat: 48.1389191835 Long: -122.167051560833 Datum: WGS 84  
 Soil Map Unit Name: Norma 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 \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |  |
|---|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | <b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks:<br><p align="center"><b>Not all three wetland criteria observed, only hydrophytic vegetation present.</b></p>  |  |

**VEGETATION – Use scientific names of plants.**

|   | Absolute % Cover | Dominant Species? | Indicator Status |   |  |
|---|------------------|-------------------|------------------|---|--|
| <b>Tree Stratum</b> (Plot size: <u>30 ft</u> )          |                  |                   |                  |   |  |
| 1. <u>Alnus rubra</u>                                   | <u>75</u>        | <u>Yes</u>        | <u>FAC</u>       | <b>Dominance Test worksheet:</b><br>Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A)<br><br>Total Number of Dominant Species Across All Strata: <u>5</u> (B)<br><br>Percent of Dominant Species That Are OBL, FACW, or FAC: <u>80%</u> (A/B)   |  |
| 2. <u>Frangula purshiana</u>                            | <u>25</u>        | <u>Yes</u>        | <u>FAC</u>       |   |  |
| 3. _____  |                  |                   |                  |   |  |
| 4. _____  |                  |                   |                  |   |  |
|   | <u>100</u>       | = Total Cover     |                  |   |  |
| <b>Sapling/Shrub Stratum</b> (Plot size: <u>15 ft</u> ) |                  |                   |                  |   |  |
| 1. <u>Sambucus racemosa</u>                             | <u>60</u>        | <u>Yes</u>        | <u>FACU</u>      | <b>Prevalence Index worksheet:</b><br>Total % Cover of: _____ Multiply by:<br>OBL species _____ x 1 = _____<br>FACW species _____ x 2 = _____<br>FAC species _____ x 3 = _____<br>FACU species _____ x 4 = _____<br>UPL species _____ x 5 = _____<br>Column Totals: _____ (A) _____ (B)<br><br>Prevalence Index = B/A = _____ |  |
| 2. <u>Rubus armeniacus</u>                              | <u>25</u>        | <u>Yes</u>        | <u>FAC</u>       |   |  |
| 3. <u>Populus tremuloides</u>                           | <u>5</u>         | <u>No</u>         | <u>FACU</u>      |   |  |
| 4. _____  |                  |                   |                  |   |  |
| 5. _____  |                  |                   |                  |   |  |
|   | <u>90</u>        | = Total Cover     |                  |   |  |
| <b>Herb Stratum</b> (Plot size: <u>5 ft</u> )           |                  |                   |                  |   |  |
| 1. <u>Ranunculus repens</u>                             | <u>80</u>        | <u>Yes</u>        | <u>FAC</u>       |   |  |
| 2. <u>Rubus ursinus</u>                                 | <u>15</u>        | <u>No</u>         | <u>FACU</u>      |   |  |
| 3. _____  |                  |                   |                  |   |  |
| 4. _____  |                  |                   |                  |   |  |
| 5. _____  |                  |                   |                  |   |  |
| 6. _____  |                  |                   |                  |   |  |
| 7. _____  |                  |                   |                  |   |  |
| 8. _____  |                  |                   |                  |   |  |
| 9. _____  |                  |                   |                  |   |  |
| 10. _____   |                  |                   |                  |   |  |
| 11. _____   |                  |                   |                  |   |  |
|   | <u>95</u>        | = Total Cover     |                  |   |  |
| <b>Woody Vine Stratum</b> (Plot size: <u>30 ft</u> )    |                  |                   |                  |   |  |
| 1. _____  |                  |                   |                  |   |  |
| 2. _____  |                  |                   |                  |   |  |
|   | <u>0</u>         | = Total Cover     |                  |   |  |
| % Bare Ground in Herb Stratum <u>5</u>                  |                  |                   |                  |   |  |

Remarks: Hydrophytic vegetation criterion observed through dominance test indicator.

**SOIL**

Sampling Point: DP-48

| <b>Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)</b> |               |     |                |   |                   |                  |         |         |
|--|---------------|-----|----------------|---|-------------------|------------------|---------|---------|
| Depth<br>(inches)  | Matrix        |     | Redox Features |   |                   | Loc <sup>2</sup> | Texture | Remarks |
|  | Color (moist) | %   | Color (moist)  | % | Type <sup>1</sup> |                  |         |         |
| 0 - 11   | 10YR 3/3      | 100 | /              |   |                   |                  | SaLo    |         |
| 11 - 13  | 7.5YR 3/2     | 99  | 7.5YR 4/6      | 1 | C, C <sub>s</sub> | M                | SaLo    |         |
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## WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 06/20/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-49  
 Investigator(s): Emily Swaim, Kyla Caddey Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): Concave Slope (%): 2  
 Subregion (LRR): A-2 Lat: 48.139222 Long: -122.16637033 Datum: WGS 84  
 Soil Map Unit Name: Norma Loam NWI classification: \_\_\_\_\_

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |  |
|---|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | <b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| Remarks:<br><p style="text-align: center; font-weight: bold;">Not all three wetland criteria observed, hydric soil and wetland hydrology present.</p>   |  |

### VEGETATION – Use scientific names of plants.

| <u>Tree Stratum</u> (Plot size: <u>30 ft</u> )          | Absolute % Cover | Dominant Species? | Indicator Status |  |
|---|------------------|-------------------|------------------|--|
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
| <u>0</u> = Total Cover                                  |                  |                   |                  |  |
| <u>Sapling/Shrub Stratum</u> (Plot size: <u>15 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
| 5. _____  | _____            | _____             | _____            |  |
| <u>0</u> = Total Cover                                  |                  |                   |                  |  |
| <u>Herb Stratum</u> (Plot size: <u>5 ft</u> )           | Absolute % Cover | Dominant Species? | Indicator Status |  |
| 1. <u>Ranunculus repens</u>                             | <u>40</u>        | <u>Yes</u>        | <u>FAC</u>       |  |
| 2. <u>Juncus effusus</u>                                | <u>25</u>        | <u>Yes</u>        | <u>FACW</u>      |  |
| 3. <u>unidentified grass spp.</u>                       | <u>20</u>        | <u>Yes</u>        | <u>FAC</u>       |  |
| 4. <u>unidentified grass spp.</u>                       | <u>15</u>        | <u>No</u>         | <u>FAC</u>       |  |
| 5. _____  | _____            | _____             | _____            |  |
| 6. _____  | _____            | _____             | _____            |  |
| 7. _____  | _____            | _____             | _____            |  |
| 8. _____  | _____            | _____             | _____            |  |
| 9. _____  | _____            | _____             | _____            |  |
| 10. _____   | _____            | _____             | _____            |  |
| 11. _____   | _____            | _____             | _____            |  |
| <u>100</u> = Total Cover                                |                  |                   |                  |  |
| <u>Woody Vine Stratum</u> (Plot size: <u>30 ft</u> )    | Absolute % Cover | Dominant Species? | Indicator Status |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
| <u>0</u> = Total Cover                                  |                  |                   |                  |  |
| % Bare Ground in Herb Stratum <u>0</u>                  |                  |                   |                  |  |

**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:**  
 Rapid Test for Hydrophytic Vegetation  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

|   |  |
|---|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |  |
|---|--|

Remarks: Hydrophytic vegetation criterion observed through dominance test indicator.

**SOIL**

Sampling Point: DP-49

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

| Depth (inches) | Matrix        |    | Redox Features |    |                   | Loc <sup>2</sup> | Texture | Remarks |
|----------------|---------------|----|----------------|----|-------------------|------------------|---------|---------|
|                | Color (moist) | %  | Color (moist)  | %  | Type <sup>1</sup> |                  |         |         |
| 0 - 10         | 10YR 3/2      | 95 | 7.5YR 2.5/3    | 5  | C                 | M                | SaLo    |         |
| 10 - 16        | 6/1           | 75 | 7.5YR 5/8      | 25 | C                 | M                | SaLo    |         |
|                |               |    |                |    |                   |                  |         |         |
|                |               |    |                |    |                   |                  |         |         |
|                |               |    |                |    |                   |                  |         |         |
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|                |               |    |                |    |                   |                  |         |         |

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

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

|   |  |   |
|---|--|---|
| <input type="checkbox"/> Histosol (A1)                                | <input type="checkbox"/> Sandy Redox (S5)                                  | <b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b> |
| <input type="checkbox"/> Histic Epipedon (A2)                         | <input type="checkbox"/> Stripped Matrix (S6)                              |   |
| <input type="checkbox"/> Black Histic (A3)                            | <input type="checkbox"/> Loamy Mucky Mineral (F1) ( <b>except MLRA 1</b> ) |   |
| <input type="checkbox"/> Hydrogen Sulfide (A4)                        | <input type="checkbox"/> Loamy Gleyed Matrix (F2)                          |   |
| <input checked="" type="checkbox"/> Depleted Below Dark Surface (A11) | <input checked="" type="checkbox"/> Depleted Matrix (F3)                   |   |
| <input type="checkbox"/> Thick Dark Surface (A12)                     | <input type="checkbox"/> Redox Dark Surface (F6)                           |   |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)                     | <input type="checkbox"/> Depleted Dark Surface (F7)                        |   |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4)                     | <input type="checkbox"/> Redox Depressions (F8)                            |   |

<sup>3</sup>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:  
 Hydric soil criterion observed through A11 & F3 indicator.

**HYDROLOGY**

**Wetland Hydrology Indicators:**

|   |   |
|---|---|
| <b>Primary Indicators (minimum of one required; check all that apply)</b>   | <b>Secondary Indicators (2 or more required)</b>  |
| <input type="checkbox"/> Surface Water (A1)<br><input type="checkbox"/> High Water Table (A2)<br><input type="checkbox"/> Saturation (A3)<br><input type="checkbox"/> Water Marks (B1)<br><input type="checkbox"/> Sediment Deposits (B2)<br><input type="checkbox"/> Drift Deposits (B3)<br><input type="checkbox"/> Algal Mat or Crust (B4)<br><input type="checkbox"/> Iron Deposits (B5)<br><input type="checkbox"/> Surface Soil Cracks (B6)<br><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)<br><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | <input type="checkbox"/> Water-Stained Leaves (B9) ( <b>except MLRA 1, 2, 4A, and 4B</b> )<br><input type="checkbox"/> Salt Crust (B11)<br><input type="checkbox"/> Aquatic Invertebrates (B13)<br><input type="checkbox"/> Hydrogen Sulfide Odor (C1)<br><input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)<br><input type="checkbox"/> Presence of Reduced Iron (C4)<br><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)<br><input type="checkbox"/> Stunted or Stressed Plants (D1) ( <b>LRR A</b> )<br><input type="checkbox"/> Other (Explain in Remarks) |
|   | <input type="checkbox"/> Water-Stained Leaves (B9) ( <b>MLRA 1, 2, 4A, and 4B</b> )<br><input type="checkbox"/> Drainage Patterns (B10)<br><input type="checkbox"/> Dry-Season Water Table (C2)<br><input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)<br><input checked="" type="checkbox"/> Geomorphic Position (D2)<br><input type="checkbox"/> Shallow Aquitard (D3)<br><input checked="" type="checkbox"/> FAC-Neutral Test (D5)<br><input type="checkbox"/> Raised Ant Mounds (D6) ( <b>LRR A</b> )<br><input type="checkbox"/> Frost-Heave Hummocks (D7)                        |

**Field Observations:**

|  |                       |   |
|--|-----------------------|---|
| Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>                             | Depth (inches): _____ | <b>Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></b> |
| Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>                               | Depth (inches): _____ |   |
| Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>(includes capillary fringe) | Depth (inches): _____ |   |

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

Remarks:  
 Wetland hydrology criterion observed through D2 and D5 secondary indicators.

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

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 03/01/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-5  
 Investigator(s): Emily Swaim, Richard Peel, Jon Pickett Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): None Slope (%): 0  
 Subregion (LRR): A-2 Lat: 48.139827 Long: -122.16336653 Datum: WGS 84  
 Soil Map Unit Name: Norma 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 , Soil , or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |  |
|---|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | <b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks: <b>Not all three wetland criteria observed, only hydrophytic vegetation and hydric soils were observed. Non-wetland hydrology confirmed by groundwater monitoring study.</b>   |  |

### VEGETATION – Use scientific names of plants.

|   | Absolute % Cover | Dominant Species? | Indicator Status |  |
|---|------------------|-------------------|------------------|--|
| <b>Tree Stratum</b> (Plot size: <u>30 ft</u> )          |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| <b>Sapling/Shrub Stratum</b> (Plot size: <u>15 ft</u> ) |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
| 5. _____  | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| <b>Herb Stratum</b> (Plot size: <u>5 ft</u> )           |                  |                   |                  |  |
| 1. <u>Holcus lanatus</u>                                | <u>50</u>        | <u>Yes</u>        | <u>FAC</u>       |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
| 5. _____  | _____            | _____             | _____            |  |
| 6. _____  | _____            | _____             | _____            |  |
| 7. _____  | _____            | _____             | _____            |  |
| 8. _____  | _____            | _____             | _____            |  |
| 9. _____  | _____            | _____             | _____            |  |
| 10. _____   | _____            | _____             | _____            |  |
| 11. _____   | _____            | _____             | _____            |  |
|   | <u>50</u>        | = Total Cover     |                  |  |
| <b>Woody Vine Stratum</b> (Plot size: <u>30 ft</u> )    |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| <b>% Bare Ground in Herb Stratum</b> <u>50</u>          |                  |                   |                  |  |

**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 0 x 2 = 0  
 FAC species 50 x 3 = 150  
 FACU species 0 x 4 = 0  
 UPL species 0 x 5 = 0  
 Column Totals: 50 (A) 150 (B)  
 Prevalence Index = B/A = 3

**Hydrophytic Vegetation Indicators:**  
 Rapid Test for Hydrophytic Vegetation  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes  No

Remarks: **Hydrophytic vegetation criterion observed through dominance test indicator.**

**SOIL**

Sampling Point: DP-5

| <b>Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)</b> |               |    |                |    |                   |                  |         |         |
|--|---------------|----|----------------|----|-------------------|------------------|---------|---------|
| Depth<br>(inches)  | Matrix        |    | Redox Features |    |                   | Loc <sup>2</sup> | Texture | Remarks |
|  | Color (moist) | %  | Color (moist)  | %  | Type <sup>1</sup> |                  |         |         |
| 0 - 7  | 10YR 3/1      | 98 | 7.5YR 3/4      | 2  | C                 | M, PL            | SaLo    |         |
| 7 - 30   | 2.5Y 4/2      | 90 | 2.5Y 4/4       | 10 | C                 | M, PL            | SiCiLo  |         |
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## WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 06/20/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-50  
 Investigator(s): Emily Swaim, Richard Peel Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): None Slope (%): 1  
 Subregion (LRR): A-2 Lat: 48.1391517776667 Long: -122.166669786833 Datum: WGS 84  
 Soil Map Unit Name: Norma 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 \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |  |
|---|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | <b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks:<br><p style="text-align: center; font-weight: bold;">Not all three wetland criteria observed, only hydrophytic vegetation present.</p>   |  |

### VEGETATION – Use scientific names of plants.

|   | Absolute % Cover | Dominant Species? | Indicator Status |   |  |
|---|------------------|-------------------|------------------|---|--|
| <b>Tree Stratum</b> (Plot size: <u>30 ft</u> )          |                  |                   |                  |   |  |
| 1. <u>Betula papyrifera</u>                             | <u>75</u>        | Yes               | FAC              | <b>Dominance Test worksheet:</b><br>Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A)<br><br>Total Number of Dominant Species Across All Strata: <u>4</u> (B)<br><br>Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)  |  |
| 2. <u>Alnus rubra</u>                                   | <u>5</u>         | No                | FAC              |   |  |
| 3. _____  |                  |                   |                  |   |  |
| 4. _____  |                  |                   |                  |   |  |
|   | <u>80</u>        | = Total Cover     |                  |   |  |
| <b>Sapling/Shrub Stratum</b> (Plot size: <u>15 ft</u> ) |                  |                   |                  |   |  |
| 1. <u>Lonicera involucrata</u>                          | <u>25</u>        | Yes               | FAC              | <b>Prevalence Index worksheet:</b><br>Total % Cover of: _____ Multiply by:<br>OBL species _____ x 1 = _____<br>FACW species _____ x 2 = _____<br>FAC species _____ x 3 = _____<br>FACU species _____ x 4 = _____<br>UPL species _____ x 5 = _____<br>Column Totals: _____ (A) _____ (B)<br><br>Prevalence Index = B/A = _____ |  |
| 2. <u>Rubus armeniacus</u>                              | <u>20</u>        | Yes               | FAC              |   |  |
| 3. <u>Rubus laciniatus</u>                              | <u>5</u>         | No                | FACU             |   |  |
| 4. _____  |                  |                   |                  |   |  |
| 5. _____  |                  |                   |                  |   |  |
|   | <u>50</u>        | = Total Cover     |                  |   |  |
| <b>Herb Stratum</b> (Plot size: <u>5 ft</u> )           |                  |                   |                  |   |  |
| 1. <u>Ranunculus repens</u>                             | <u>85</u>        | Yes               | FAC              |   |  |
| 2. <u>Polystichum munitum</u>                           | <u>10</u>        | No                | FACU             |   |  |
| 3. _____  |                  |                   |                  |   |  |
| 4. _____  |                  |                   |                  |   |  |
| 5. _____  |                  |                   |                  |   |  |
| 6. _____  |                  |                   |                  |   |  |
| 7. _____  |                  |                   |                  |   |  |
| 8. _____  |                  |                   |                  |   |  |
| 9. _____  |                  |                   |                  |   |  |
| 10. _____   |                  |                   |                  |   |  |
| 11. _____   |                  |                   |                  |   |  |
|   | <u>95</u>        | = Total Cover     |                  |   |  |
| <b>Woody Vine Stratum</b> (Plot size: <u>30 ft</u> )    |                  |                   |                  |   |  |
| 1. _____  |                  |                   |                  |   |  |
| 2. _____  |                  |                   |                  |   |  |
|   | <u>0</u>         | = Total Cover     |                  |   |  |
| % Bare Ground in Herb Stratum <u>5</u>                  |                  |                   |                  |   |  |

Remarks: Hydrophytic vegetation criterion observed through rapid and dominance test indicator.



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

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 06/20/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-51  
 Investigator(s): Emily Swaim, Richard Peel Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): Concave Slope (%): 0  
 Subregion (LRR): A-2 Lat: 48.1410193538333 Long: -122.165847883333 Datum: WGS 84  
 Soil Map Unit Name: Custer fine 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 \_\_\_\_\_, Soil , or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |  |
|---|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | <b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| Remarks:<br><p align="center"><b>Wetland E plot. All three wetland criteria observed.</b></p>   |  |

**VEGETATION – Use scientific names of plants.**

| <u>Tree Stratum</u> (Plot size: <u>30 ft</u> )          | <u>Absolute % Cover</u> | <u>Dominant Species?</u> | <u>Indicator Status</u> |                         |
|---|-------------------------|--------------------------|-------------------------|-------------------------|
| 1. _____  | _____                   | _____                    | _____                   |                         |
| 2. _____  | _____                   | _____                    | _____                   |                         |
| 3. _____  | _____                   | _____                    | _____                   |                         |
| 4. _____  | _____                   | _____                    | _____                   |                         |
|   |                         |                          |                         | <u>0</u> = Total Cover  |
| <u>Sapling/Shrub Stratum</u> (Plot size: <u>15 ft</u> ) |                         |                          |                         |                         |
| 1. _____  | _____                   | _____                    | _____                   |                         |
| 2. _____  | _____                   | _____                    | _____                   |                         |
| 3. _____  | _____                   | _____                    | _____                   |                         |
| 4. _____  | _____                   | _____                    | _____                   |                         |
| 5. _____  | _____                   | _____                    | _____                   |                         |
|   |                         |                          |                         | <u>0</u> = Total Cover  |
| <u>Herb Stratum</u> (Plot size: <u>5 ft</u> )           |                         |                          |                         |                         |
| 1. <u>Holcus lanatus</u>                                | <u>25</u>               | <u>Yes</u>               | <u>FAC</u>              |                         |
| 2. <u>Juncus bufonius</u>                               | <u>10</u>               | <u>Yes</u>               | <u>FACW</u>             |                         |
| 3. <u>Grass short not hairy</u>                         | <u>5</u>                | <u>No</u>                | <u>FAC</u>              |                         |
| 4. <u>Trifolium repens</u>                              | <u>5</u>                | <u>No</u>                | <u>FAC</u>              |                         |
| 5. <u>Epilobium ciliatum</u>                            | <u>5</u>                | <u>No</u>                | <u>FACW</u>             |                         |
| 6. <u>Gnaphalium uliginosum</u>                         | <u>5</u>                | <u>No</u>                | <u>FAC</u>              |                         |
| 7. _____  | _____                   | _____                    | _____                   |                         |
| 8. _____  | _____                   | _____                    | _____                   |                         |
| 9. _____  | _____                   | _____                    | _____                   |                         |
| 10. _____   | _____                   | _____                    | _____                   |                         |
| 11. _____   | _____                   | _____                    | _____                   |                         |
|   |                         |                          |                         | <u>55</u> = Total Cover |
| <u>Woody Vine Stratum</u> (Plot size: <u>30 ft</u> )    |                         |                          |                         |                         |
| 1. _____  | _____                   | _____                    | _____                   |                         |
| 2. _____  | _____                   | _____                    | _____                   |                         |
|   |                         |                          |                         | <u>0</u> = Total Cover  |
| % Bare Ground in Herb Stratum <u>45</u>                 |                         |                          |                         |                         |

**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:**  
 Rapid Test for Hydrophytic Vegetation  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes  No

Remarks: Hydrophytic vegetation criterion observed through dominance test indicator.

**SOIL**

Sampling Point: DP-51

| Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) |               |    |                |   |                   |                  |         |                       |
|---|---------------|----|----------------|---|-------------------|------------------|---------|-----------------------|
| Depth (inches)  | Matrix        |    | Redox Features |   |                   | Loc <sup>2</sup> | Texture | Remarks               |
|   | Color (moist) | %  | Color (moist)  | % | Type <sup>1</sup> |                  |         |                       |
| 0 - 9   | 10YR 3/1      | 95 | 2.5YR 2.5/4    | 5 | C                 | PL, M            | SaLo    |                       |
| 9 - 14  | 5Y 5/2        | 95 | 5/8            | 5 | C, C <sub>s</sub> | M                | SaLo    | Fine sand less coarse |
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**WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region**

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 06/20/2018  
 Applicant/Owner: Columbia Bank State: WA Sampling Point: DP-52  
 Investigator(s): Emily Swaim, Richard Peel Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None Slope (%): 2  
 Subregion (LRR): A-2 Lat: 48.1410737148333 Long: -122.164899562833 Datum: WGS 84  
 Soil Map Unit Name: Custer fine 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 , Soil , or Hydrology  significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology  naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |  |
|---|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | <b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks:<br><p align="center"><b>Not all three wetland criteria observed, only hydrophytic vegetation present; tilled active - Dry</b></p>  |  |

**VEGETATION – Use scientific names of plants.**

|   | Absolute % Cover | Dominant Species? | Indicator Status |  |
|---|------------------|-------------------|------------------|--|
| <b>Tree Stratum</b> (Plot size: <u>30 ft</u> )          |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| <b>Sapling/Shrub Stratum</b> (Plot size: <u>15 ft</u> ) |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
| 5. _____  | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| <b>Herb Stratum</b> (Plot size: <u>5 ft</u> )           |                  |                   |                  |  |
| 1. <u>Equisetum arvense</u>                             | <u>15</u>        | <u>Yes</u>        | <u>FAC</u>       |  |
| 2. <u>Holcus lanatus</u>                                | <u>10</u>        | <u>Yes</u>        | <u>FAC</u>       |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. <u>Trifolium repens</u>                              | <u>5</u>         | <u>No</u>         | <u>FAC</u>       |  |
| 5. <u>Gnaphalium uliginosum</u>                         | <u>5</u>         | <u>No</u>         | <u>FAC</u>       |  |
| 6. <u>Long slender flat glass thick leaves</u>          | <u>5</u>         | <u>No</u>         | <u>FAC</u>       |  |
| 7. <u>Epilobium ciliatum</u>                            | <u>5</u>         | <u>No</u>         | <u>FACW</u>      |  |
| 8. _____  | _____            | _____             | _____            |  |
| 9. _____  | _____            | _____             | _____            |  |
| 10. _____   | _____            | _____             | _____            |  |
| 11. _____   | _____            | _____             | _____            |  |
|   | <u>45</u>        | = Total Cover     |                  |  |
| <b>Woody Vine Stratum</b> (Plot size: <u>30 ft</u> )    |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| <b>% Bare Ground in Herb Stratum</b> <u>55</u>          |                  |                   |                  |  |

**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:**  
 Rapid Test for Hydrophytic Vegetation  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes  No

Remarks: Hydrophytic vegetation criterion observed through dominance test indicator; 50% moss



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

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 03/01/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-6  
 Investigator(s): Richard Peel, Emily Swaim Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): Concave Slope (%): 0  
 Subregion (LRR): A-2 Lat: 48.139185 Long: -122.16344758 Datum: WGS 84  
 Soil Map Unit Name: Norma 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 , Soil , or Hydrology  significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology  naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |  |
|---|--|
| Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | <b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks:<br><p align="center"><b>No wetland criteria observed. Non-wetland hydrology confirmed by groundwater monitoring study.</b></p>   |  |

**VEGETATION – Use scientific names of plants.**

| <u>Tree Stratum</u> (Plot size: <u>30 ft</u> )          | Absolute % Cover | Dominant Species? | Indicator Status |                         |
|---|------------------|-------------------|------------------|-------------------------|
| 1. _____  | _____            | _____             | _____            |                         |
| 2. _____  | _____            | _____             | _____            |                         |
| 3. _____  | _____            | _____             | _____            |                         |
| 4. _____  | _____            | _____             | _____            |                         |
|   |                  |                   |                  | <u>0</u> = Total Cover  |
| <u>Sapling/Shrub Stratum</u> (Plot size: <u>15 ft</u> ) |                  |                   |                  |                         |
| 1. _____  | _____            | _____             | _____            |                         |
| 2. _____  | _____            | _____             | _____            |                         |
| 3. _____  | _____            | _____             | _____            |                         |
| 4. _____  | _____            | _____             | _____            |                         |
| 5. _____  | _____            | _____             | _____            |                         |
|   |                  |                   |                  | <u>0</u> = Total Cover  |
| <u>Herb Stratum</u> (Plot size: <u>5 ft</u> )           |                  |                   |                  |                         |
| 1. <u>Trifolium pratense</u>                            | <u>5</u>         | <u>Yes</u>        | <u>FACU</u>      |                         |
| 2. <u>Agrostis capillaris</u>                           | <u>5</u>         | <u>Yes</u>        | <u>FAC</u>       |                         |
| 3. _____  | _____            | _____             | _____            |                         |
| 4. _____  | _____            | _____             | _____            |                         |
| 5. _____  | _____            | _____             | _____            |                         |
| 6. _____  | _____            | _____             | _____            |                         |
| 7. _____  | _____            | _____             | _____            |                         |
| 8. _____  | _____            | _____             | _____            |                         |
| 9. _____  | _____            | _____             | _____            |                         |
| 10. _____   | _____            | _____             | _____            |                         |
| 11. _____   | _____            | _____             | _____            |                         |
|   |                  |                   |                  | <u>10</u> = Total Cover |
| <u>Woody Vine Stratum</u> (Plot size: <u>30 ft</u> )    |                  |                   |                  |                         |
| 1. _____  | _____            | _____             | _____            |                         |
| 2. _____  | _____            | _____             | _____            |                         |
|   |                  |                   |                  | <u>0</u> = Total Cover  |
| % Bare Ground in Herb Stratum <u>90</u>                 |                  |                   |                  |                         |

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)  
 Total Number of Dominant Species Across All Strata: 2 (B)  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

**Prevalence Index worksheet:**  
 Total % Cover of: \_\_\_\_\_ Multiply by:  
 OBL species 0 x 1 = 0  
 FACW species 0 x 2 = 0  
 FAC species 5 x 3 = 15  
 FACU species 5 x 4 = 20  
 UPL species 0 x 5 = 0  
 Column Totals: 10 (A) 35 (B)  
 Prevalence Index = B/A = 3.5

**Hydrophytic Vegetation Indicators:**  
 Rapid Test for Hydrophytic Vegetation  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes  No

Remarks: No hydrophytic vegetation indicators observed.

**SOIL**

Sampling Point: DP-6

| Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)                                    |               |    |   |   |                   |   |         |         |
|--|---------------|----|---|---|-------------------|---|---------|---------|
| Depth (inches)   | Matrix        |    | Redox Features  |   |                   | Loc <sup>2</sup>  | Texture | Remarks |
|  | Color (moist) | %  | Color (moist)   | % | Type <sup>1</sup> |   |         |         |
| 0 - 9  | 2.5y 3/2      | 99 | 5yr 3/4   | 1 | C                 | PL, M   | SaLo    |         |
| 9 - 16   | 2.5y 3/3      | 95 | 5yr 3/4   | 5 | C                 | PL, M   | SaCilo  |         |
| 16 - 30  | 2.5y 4/2      | 99 | 7.5yr 4/4   | 1 | CS                |   | LoSa    |         |
|  |               |    |   |   |                   |   |         |         |
|  |               |    |   |   |                   |   |         |         |
|  |               |    |   |   |                   |   |         |         |
|  |               |    |   |   |                   |   |         |         |
|  |               |    |   |   |                   |   |         |         |
|  |               |    |   |   |                   |   |         |         |
| <sup>1</sup> Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup> Location: PL=Pore Lining, M=Matrix. |               |    |   |   |                   |   |         |         |
| <b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b>   |               |    |   |   |                   | <b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b>   |         |         |
| <input type="checkbox"/> Histosol (A1)   |               |    | <input type="checkbox"/> Sandy Redox (S5)                         |   |                   | <input type="checkbox"/> 2 cm Muck (A10)  |         |         |
| <input type="checkbox"/> Histic Epipedon (A2)  |               |    | <input type="checkbox"/> Stripped Matrix (S6)                     |   |                   | <input type="checkbox"/> Red Parent Material (TF2)  |         |         |
| <input type="checkbox"/> Black Histic (A3)   |               |    | <input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1) |   |                   | <input type="checkbox"/> Very Shallow Dark Surface (TF12)   |         |         |
| <input type="checkbox"/> Hydrogen Sulfide (A4)   |               |    | <input type="checkbox"/> Loamy Gleyed Matrix (F2)                 |   |                   | <input type="checkbox"/> Other (Explain in Remarks)   |         |         |
| <input type="checkbox"/> Depleted Below Dark Surface (A11)   |               |    | <input type="checkbox"/> Depleted Matrix (F3)                     |   |                   | <sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. |         |         |
| <input type="checkbox"/> Thick Dark Surface (A12)  |               |    | <input type="checkbox"/> Redox Dark Surface (F6)                  |   |                   |   |         |         |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)  |               |    | <input type="checkbox"/> Depleted Dark Surface (F7)               |   |                   |   |         |         |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4)  |               |    | <input type="checkbox"/> Redox Depressions (F8)                   |   |                   |   |         |         |
|  |               |    |   |   |                   |   |         |         |
| <b>Restrictive Layer (if present):</b><br>Type: _____<br>Depth (inches): _____   |               |    |   |   |                   | <b>Hydric Soil Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>                           |         |         |
| Remarks:<br>No hydric soils indicators observed.   |               |    |   |   |                   |   |         |         |

**HYDROLOGY**

| Wetland Hydrology Indicators:  |   |   |  |
|--|---|---|--|
| Primary Indicators (minimum of one required; check all that apply)   |   | Secondary Indicators (2 or more required)   |  |
| <input type="checkbox"/> Surface Water (A1)  | <input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) | <input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)                            |  |
| <input checked="" type="checkbox"/> High Water Table (A2)  | <input type="checkbox"/> Salt Crust (B11)   | <input type="checkbox"/> Drainage Patterns (B10)  |  |
| <input checked="" type="checkbox"/> Saturation (A3)  | <input type="checkbox"/> Aquatic Invertebrates (B13)                              | <input type="checkbox"/> Dry-Season Water Table (C2)  |  |
| <input type="checkbox"/> Water Marks (B1)  | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                               | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)                                    |  |
| <input type="checkbox"/> Sediment Deposits (B2)  | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)            | <input type="checkbox"/> Geomorphic Position (D2)   |  |
| <input type="checkbox"/> Drift Deposits (B3)   | <input type="checkbox"/> Presence of Reduced Iron (C4)                            | <input type="checkbox"/> Shallow Aquitard (D3)  |  |
| <input type="checkbox"/> Algal Mat or Crust (B4)   | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)               | <input type="checkbox"/> FAC-Neutral Test (D5)  |  |
| <input type="checkbox"/> Iron Deposits (B5)  | <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)                  | <input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)   |  |
| <input type="checkbox"/> Surface Soil Cracks (B6)  | <input type="checkbox"/> Other (Explain in Remarks)                               | <input type="checkbox"/> Frost-Heave Hummocks (D7)  |  |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)   |   |   |  |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   |   |   |  |
| <b>Field Observations:</b><br>Surface Water Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____<br>Water Table Present?    Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>10</u><br>Saturation Present?    Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>6</u><br>(includes capillary fringe) |   | <b>Wetland Hydrology Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |  |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:   |   |   |  |
| Remarks:<br>Wetland hydrology criterion observed through A2 & A3 primary indicators during non-growing season at time of monitoring well installation on March 1, 2018. Monitoring well installed at monitoring location MP-6 indicated non-wetland hydrology. Monitoring well was observed weekly from March 6 to June 5, 2018.   |   |   |  |

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

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 03/01/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-7  
 Investigator(s): Richard Peel, Emily Swaim Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): Concave Slope (%): 0  
 Subregion (LRR): A-2 Lat: 48.139052 Long: -122.16280436 Datum: WGS 84  
 Soil Map Unit Name: Norma 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 , Soil , or Hydrology  significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology  naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |  |
|---|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | <b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| Remarks: <b>Wetland B plot. All three wetland criteria observed. Wetland hydrology confirmed by groundwater monitoring study.</b>   |  |

**VEGETATION – Use scientific names of plants.**

| <u>Tree Stratum</u> (Plot size: <u>30 ft</u> )          | <u>Absolute % Cover</u> | <u>Dominant Species?</u> | <u>Indicator Status</u> |                         |
|---|-------------------------|--------------------------|-------------------------|-------------------------|
| 1. _____  | _____                   | _____                    | _____                   |                         |
| 2. _____  | _____                   | _____                    | _____                   |                         |
| 3. _____  | _____                   | _____                    | _____                   |                         |
| 4. _____  | _____                   | _____                    | _____                   |                         |
|   |                         |                          |                         | <u>0</u> = Total Cover  |
| <u>Sapling/Shrub Stratum</u> (Plot size: <u>15 ft</u> ) |                         |                          |                         |                         |
| 1. _____  | _____                   | _____                    | _____                   |                         |
| 2. _____  | _____                   | _____                    | _____                   |                         |
| 3. _____  | _____                   | _____                    | _____                   |                         |
| 4. _____  | _____                   | _____                    | _____                   |                         |
| 5. _____  | _____                   | _____                    | _____                   |                         |
|   |                         |                          |                         | <u>0</u> = Total Cover  |
| <u>Herb Stratum</u> (Plot size: <u>5 ft</u> )           |                         |                          |                         |                         |
| 1. <u>Agrostis capillaris</u>                           | <u>15</u>               | <u>Yes</u>               | <u>FAC</u>              |                         |
| 2. _____  | _____                   | _____                    | _____                   |                         |
| 3. _____  | _____                   | _____                    | _____                   |                         |
| 4. _____  | _____                   | _____                    | _____                   |                         |
| 5. _____  | _____                   | _____                    | _____                   |                         |
| 6. _____  | _____                   | _____                    | _____                   |                         |
| 7. _____  | _____                   | _____                    | _____                   |                         |
| 8. _____  | _____                   | _____                    | _____                   |                         |
| 9. _____  | _____                   | _____                    | _____                   |                         |
| 10. _____   | _____                   | _____                    | _____                   |                         |
| 11. _____   | _____                   | _____                    | _____                   |                         |
|   |                         |                          |                         | <u>15</u> = Total Cover |
| <u>Woody Vine Stratum</u> (Plot size: <u>30 ft</u> )    |                         |                          |                         |                         |
| 1. _____  | _____                   | _____                    | _____                   |                         |
| 2. _____  | _____                   | _____                    | _____                   |                         |
|   |                         |                          |                         | <u>0</u> = Total Cover  |
| % Bare Ground in Herb Stratum <u>85</u>                 |                         |                          |                         |                         |

**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 0 x 2 = 0  
 FAC species 15 x 3 = 45  
 FACU species 0 x 4 = 0  
 UPL species 0 x 5 = 0  
 Column Totals: 15 (A) 45 (B)  
 Prevalence Index = B/A = 3

**Hydrophytic Vegetation Indicators:**  
 Rapid Test for Hydrophytic Vegetation  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes  No

Remarks: **Hydrophytic vegetation criterion observed through dominance test indicator.**

**SOIL**

Sampling Point: DP-7

| Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) |               |    |                   |    |                   |                  |         |         |
|---|---------------|----|-------------------|----|-------------------|------------------|---------|---------|
| Depth (inches)  | Matrix        |    | Redox Features    |    |                   | Loc <sup>2</sup> | Texture | Remarks |
|   | Color (moist) | %  | Color (moist)     | %  | Type <sup>1</sup> |                  |         |         |
| 0 - 10  | 10YR 3/2      | 98 | 5yr 3/4           | 2  | C                 | PL               | SaLo    |         |
| 10 - 24   | 10Y 5/1       | 70 | 5yr 3/4 7.5yr 4/€ | 30 | CS                | M                | LoSa    |         |
| 24 - 30   | 5gy 5/1       | 85 | 5yr 3/4           | 15 | CS                | M                | LoSa    |         |
|   |               |    |                   |    |                   |                  |         |         |
|   |               |    |                   |    |                   |                  |         |         |
|   |               |    |                   |    |                   |                  |         |         |
|   |               |    |                   |    |                   |                  |         |         |
|   |               |    |                   |    |                   |                  |         |         |

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

|  |  |   |
|--|--|---|
| <b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b><br><input type="checkbox"/> Histosol (A1)<br><input type="checkbox"/> Histic Epipedon (A2)<br><input type="checkbox"/> Black Histic (A3)<br><input type="checkbox"/> Hydrogen Sulfide (A4)<br><input type="checkbox"/> Depleted Below Dark Surface (A11)<br><input type="checkbox"/> Thick Dark Surface (A12)<br><input type="checkbox"/> Sandy Mucky Mineral (S1)<br><input type="checkbox"/> Sandy Gleyed Matrix (S4) | <input type="checkbox"/> Sandy Redox (S5)<br><input type="checkbox"/> Stripped Matrix (S6)<br><input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)<br><input type="checkbox"/> Loamy Gleyed Matrix (F2)<br><input checked="" type="checkbox"/> Depleted Matrix (F3)<br><input type="checkbox"/> Redox Dark Surface (F6)<br><input type="checkbox"/> Depleted Dark Surface (F7)<br><input type="checkbox"/> Redox Depressions (F8) | <b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b><br><input type="checkbox"/> 2 cm Muck (A10)<br><input type="checkbox"/> Red Parent Material (TF2)<br><input type="checkbox"/> Very Shallow Dark Surface (TF12)<br><input type="checkbox"/> Other (Explain in Remarks) |
|--|--|---|

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

|  |   |
|--|---|
| <b>Restrictive Layer (if present):</b><br>Type: _____<br>Depth (inches): _____ | <b>Hydric Soil Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
|--|---|

Remarks:  
Hydric soil criterion observed through A3 indicator.

**HYDROLOGY**

|   |   |  |  |
|---|---|--|--|
| <b>Wetland Hydrology Indicators:</b><br>Primary Indicators (minimum of one required; check all that apply)  |   | Secondary Indicators (2 or more required)  |  |
| <input type="checkbox"/> Surface Water (A1)<br><input checked="" type="checkbox"/> High Water Table (A2)<br><input checked="" type="checkbox"/> Saturation (A3)<br><input type="checkbox"/> Water Marks (B1)<br><input type="checkbox"/> Sediment Deposits (B2)<br><input type="checkbox"/> Drift Deposits (B3)<br><input type="checkbox"/> Algal Mat or Crust (B4)<br><input type="checkbox"/> Iron Deposits (B5)<br><input type="checkbox"/> Surface Soil Cracks (B6)<br><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)<br><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | <input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)<br><input type="checkbox"/> Salt Crust (B11)<br><input type="checkbox"/> Aquatic Invertebrates (B13)<br><input type="checkbox"/> Hydrogen Sulfide Odor (C1)<br><input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)<br><input type="checkbox"/> Presence of Reduced Iron (C4)<br><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)<br><input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)<br><input type="checkbox"/> Other (Explain in Remarks) | <input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)<br><input type="checkbox"/> Drainage Patterns (B10)<br><input type="checkbox"/> Dry-Season Water Table (C2)<br><input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)<br><input type="checkbox"/> Geomorphic Position (D2)<br><input type="checkbox"/> Shallow Aquitard (D3)<br><input type="checkbox"/> FAC-Neutral Test (D5)<br><input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)<br><input type="checkbox"/> Frost-Heave Hummocks (D7) |  |
| <b>Field Observations:</b><br>Surface Water Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____<br>Water Table Present?    Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>11</u><br>Saturation Present?    Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>8</u><br>(includes capillary fringe)  |   | <b>Wetland Hydrology Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>  |  |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:  |   |  |  |
| Remarks:<br>Wetland hydrology criterion observed through A2 and A3 primary indicators during non-growing season at time of monitoring well installation on March 1, 2018. Monitoring well installed at monitoring location MP-7 indicated wetland hydrology. Monitoring well was observed weekly from March 6 to June 5, 2018.  |   |  |  |

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

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 03/01/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-8  
 Investigator(s): Richard Peel, Emily Swaim Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): Concave Slope (%): 0  
 Subregion (LRR): A-2 Lat: 48.138479 Long: -122.16328979 Datum: WGS 84  
 Soil Map Unit Name: Norma 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 , Soil , or Hydrology  significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology  naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |  |
|---|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/><br>Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | <b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks: <b>Not all three wetland criteria observed, hydrophytic vegetation present. Non-wetland hydrology confirmed by groundwater monitoring study.</b>   |  |

**VEGETATION – Use scientific names of plants.**

| <u>Tree Stratum</u> (Plot size: <u>30 ft</u> )          | <u>Absolute % Cover</u> | <u>Dominant Species?</u> | <u>Indicator Status</u> | <b>Dominance Test worksheet:</b>   |
|---|-------------------------|--------------------------|-------------------------|--|
| 1. _____  | _____                   | _____                    | _____                   | Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)<br><br>Total Number of Dominant Species Across All Strata: <u>1</u> (B)<br><br>Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)   |
| 2. _____  | _____                   | _____                    | _____                   |  |
| 3. _____  | _____                   | _____                    | _____                   |  |
| 4. _____  | _____                   | _____                    | _____                   |  |
| <u>0</u> = Total Cover                                  |                         |                          |                         | <b>Prevalence Index worksheet:</b><br>Total % Cover of: _____ Multiply by:<br>OBL species <u>0</u> x 1 = <u>0</u><br>FACW species <u>0</u> x 2 = <u>0</u><br>FAC species <u>40</u> x 3 = <u>120</u><br>FACU species <u>0</u> x 4 = <u>0</u><br>UPL species <u>0</u> x 5 = <u>0</u><br>Column Totals: <u>40</u> (A) <u>120</u> (B)<br><br>Prevalence Index = B/A = <u>3</u>   |
| <u>Sapling/Shrub Stratum</u> (Plot size: <u>15 ft</u> ) | <u>Absolute % Cover</u> | <u>Dominant Species?</u> | <u>Indicator Status</u> |  |
| 1. _____  | _____                   | _____                    | _____                   |  |
| 2. _____  | _____                   | _____                    | _____                   |  |
| 3. _____  | _____                   | _____                    | _____                   |  |
| 4. _____  | _____                   | _____                    | _____                   |  |
| 5. _____  | _____                   | _____                    | _____                   |  |
| <u>0</u> = Total Cover                                  |                         |                          |                         |  |
| <u>Herb Stratum</u> (Plot size: <u>5 ft</u> )           | <u>Absolute % Cover</u> | <u>Dominant Species?</u> | <u>Indicator Status</u> | <b>Hydrophytic Vegetation Indicators:</b><br><input type="checkbox"/> Rapid Test for Hydrophytic Vegetation<br><input checked="" type="checkbox"/> Dominance Test is >50%<br><input checked="" type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup><br><input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)<br><input type="checkbox"/> Wetland Non-Vascular Plants <sup>1</sup><br><input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)<br><br><sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. |
| 1. <u>Agrostis capillaris</u>                           | <u>40</u>               | <u>Yes</u>               | <u>FAC</u>              |  |
| 2. _____  | _____                   | _____                    | _____                   |  |
| 3. _____  | _____                   | _____                    | _____                   |  |
| 4. _____  | _____                   | _____                    | _____                   |  |
| 5. _____  | _____                   | _____                    | _____                   |  |
| 6. _____  | _____                   | _____                    | _____                   |  |
| 7. _____  | _____                   | _____                    | _____                   |  |
| 8. _____  | _____                   | _____                    | _____                   |  |
| 9. _____  | _____                   | _____                    | _____                   |  |
| 10. _____   | _____                   | _____                    | _____                   |  |
| 11. _____   | _____                   | _____                    | _____                   |  |
| <u>40</u> = Total Cover                                 |                         |                          |                         |  |
| <u>Woody Vine Stratum</u> (Plot size: <u>30 ft</u> )    | <u>Absolute % Cover</u> | <u>Dominant Species?</u> | <u>Indicator Status</u> | <b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>   |
| 1. _____  | _____                   | _____                    | _____                   |  |
| 2. _____  | _____                   | _____                    | _____                   |  |
| <u>0</u> = Total Cover                                  |                         |                          |                         |  |
| % Bare Ground in Herb Stratum <u>60</u>                 |                         |                          |                         |  |

Remarks: **Hydrophytic vegetation criterion observed through dominance test indicator.**



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

Project/Site: 1655.0001 / Schoultes Property City/County: Marysville / Snohomish Sampling Date: 03/01/2018  
 Applicant/Owner: Columbia Bank / Rob Draper State: WA Sampling Point: DP-9  
 Investigator(s): Emily Swaim, Richard Peel, Jon Pickett Section, Township, Range: 28, 31, 05N  
 Landform (hillslope, terrace, etc.): Valley Floor Local relief (concave, convex, none): None Slope (%): 0  
 Subregion (LRR): A-2 Lat: 48.137676 Long: -122.16340093 Datum: WGS 84  
 Soil Map Unit Name: Norma 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 , Soil , or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

|   |  |
|---|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | <b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks: <b>Not all three wetland criteria present, only hydrophytic vegetation and hydric soils present. Non-wetland hydrology confirmed by groundwater monitoring study.</b>  |  |

**VEGETATION – Use scientific names of plants.**

|   | Absolute % Cover | Dominant Species? | Indicator Status |  |
|---|------------------|-------------------|------------------|--|
| <b>Tree Stratum</b> (Plot size: <u>30 ft</u> )          |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| <b>Sapling/Shrub Stratum</b> (Plot size: <u>15 ft</u> ) |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
| 5. _____  | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| <b>Herb Stratum</b> (Plot size: <u>5 ft</u> )           |                  |                   |                  |  |
| 1. <u>Holcus lanatus</u>                                | <u>50</u>        | <u>Yes</u>        | <u>FAC</u>       |  |
| 2. _____  | _____            | _____             | _____            |  |
| 3. _____  | _____            | _____             | _____            |  |
| 4. _____  | _____            | _____             | _____            |  |
| 5. _____  | _____            | _____             | _____            |  |
| 6. _____  | _____            | _____             | _____            |  |
| 7. _____  | _____            | _____             | _____            |  |
| 8. _____  | _____            | _____             | _____            |  |
| 9. _____  | _____            | _____             | _____            |  |
| 10. _____   | _____            | _____             | _____            |  |
| 11. _____   | _____            | _____             | _____            |  |
|   | <u>50</u>        | = Total Cover     |                  |  |
| <b>Woody Vine Stratum</b> (Plot size: <u>30 ft</u> )    |                  |                   |                  |  |
| 1. _____  | _____            | _____             | _____            |  |
| 2. _____  | _____            | _____             | _____            |  |
|   | <u>0</u>         | = Total Cover     |                  |  |
| % Bare Ground in Herb Stratum <u>50</u>                 |                  |                   |                  |  |

**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 0 x 2 = 0  
 FAC species 50 x 3 = 150  
 FACU species 0 x 4 = 0  
 UPL species 0 x 5 = 0  
 Column Totals: 50 (A) 150 (B)  
 Prevalence Index = B/A = 3

**Hydrophytic Vegetation Indicators:**  
 Rapid Test for Hydrophytic Vegetation  
 Dominance Test is >50%  
 Prevalence Index is ≤3.0<sup>1</sup>  
 Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes  No

Remarks: **Hydrophytic vegetation criterion observed through dominance test indicator.**

**SOIL**

Sampling Point: DP-9

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

| Depth (inches) | Matrix        |     | Redox Features |   |                   | Loc <sup>2</sup> | Texture | Remarks  |
|----------------|---------------|-----|----------------|---|-------------------|------------------|---------|----------|
|                | Color (moist) | %   | Color (moist)  | % | Type <sup>1</sup> |                  |         |          |
| 0 - 9          | 10YR 3/2      | 100 |                |   |                   |                  | SaLo    | Gravelly |
| 9 - 18         | 2.5Y 5/2      | 97  | 7.5YR 5/8      | 3 | CS                | M                | LoSa    |          |
| 18 - 30        | 2.5Y 5/2      | 90  | 5YR 5/8        | 5 | CS                | M                | LoSa    |          |
| 18 - 30        |               |     | 5YR 5/6        | 5 | CS                | M                | LoSa    |          |
|                |               |     |                |   |                   |                  |         |          |
|                |               |     |                |   |                   |                  |         |          |
|                |               |     |                |   |                   |                  |         |          |
|                |               |     |                |   |                   |                  |         |          |

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

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

|   |  |   |
|---|--|---|
| <input type="checkbox"/> Histosol (A1)                                | <input type="checkbox"/> Sandy Redox (S5)                                  | <b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b> |
| <input type="checkbox"/> Histic Epipedon (A2)                         | <input type="checkbox"/> Stripped Matrix (S6)                              |   |
| <input type="checkbox"/> Black Histic (A3)                            | <input type="checkbox"/> Loamy Mucky Mineral (F1) ( <b>except MLRA 1</b> ) |   |
| <input type="checkbox"/> Hydrogen Sulfide (A4)                        | <input type="checkbox"/> Loamy Gleyed Matrix (F2)                          |   |
| <input checked="" type="checkbox"/> Depleted Below Dark Surface (A11) | <input checked="" type="checkbox"/> Depleted Matrix (F3)                   |   |
| <input type="checkbox"/> Thick Dark Surface (A12)                     | <input type="checkbox"/> Redox Dark Surface (F6)                           |   |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)                     | <input type="checkbox"/> Depleted Dark Surface (F7)                        |   |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4)                     | <input type="checkbox"/> Redox Depressions (F8)                            |   |

<sup>3</sup>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:  
 Hydric soil criterion observed through A11 & F3 indicator.

**HYDROLOGY**

**Wetland Hydrology Indicators:**

|  |   |
|--|---|
| <b>Primary Indicators (minimum of one required; check all that apply)</b>  | <b>Secondary Indicators (2 or more required)</b>  |
| <input type="checkbox"/> Surface Water (A1)<br><input type="checkbox"/> High Water Table (A2)<br><input checked="" type="checkbox"/> Saturation (A3)<br><input type="checkbox"/> Water Marks (B1)<br><input type="checkbox"/> Sediment Deposits (B2)<br><input type="checkbox"/> Drift Deposits (B3)<br><input type="checkbox"/> Algal Mat or Crust (B4)<br><input type="checkbox"/> Iron Deposits (B5)<br><input type="checkbox"/> Surface Soil Cracks (B6)<br><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)<br><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | <input type="checkbox"/> Water-Stained Leaves (B9) ( <b>except MLRA 1, 2, 4A, and 4B</b> )<br><input type="checkbox"/> Salt Crust (B11)<br><input type="checkbox"/> Aquatic Invertebrates (B13)<br><input type="checkbox"/> Hydrogen Sulfide Odor (C1)<br><input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)<br><input type="checkbox"/> Presence of Reduced Iron (C4)<br><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)<br><input type="checkbox"/> Stunted or Stressed Plants (D1) ( <b>LRR A</b> )<br><input type="checkbox"/> Other (Explain in Remarks) |
|  | <input type="checkbox"/> Water-Stained Leaves (B9) ( <b>MLRA 1, 2, 4A, and 4B</b> )<br><input type="checkbox"/> Drainage Patterns (B10)<br><input type="checkbox"/> Dry-Season Water Table (C2)<br><input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)<br><input type="checkbox"/> Geomorphic Position (D2)<br><input type="checkbox"/> Shallow Aquitard (D3)<br><input type="checkbox"/> FAC-Neutral Test (D5)<br><input type="checkbox"/> Raised Ant Mounds (D6) ( <b>LRR A</b> )<br><input type="checkbox"/> Frost-Heave Hummocks (D7)  |

**Field Observations:**

|  |                           |   |
|--|---------------------------|---|
| Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>                             | Depth (inches): _____     | <b>Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></b> |
| Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>                               | Depth (inches): <u>13</u> |   |
| Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>(includes capillary fringe) | Depth (inches): <u>8</u>  |   |

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

Remarks:  
 Wetland hydrology criterion observed through A3 primary indicator during non-growing season at time of monitoring well installation on March 1, 2018. Monitoring well installed at monitoring location MP-9 indicated non-wetland hydrology. Monitoring well was observed weekly from March 6 to June 5, 2018.

# Appendix F — Wetland Rating Forms

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Wetland name or number A

## RATING SUMMARY – Western Washington

Name of wetland (or ID #): A Date of site visit: 06/19/18  
 Rated by Emily Swaim Trained by Ecology?  Yes  No Date of training 3/31/2016  
 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 ESRI 2018

**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 |              |
|---------------------------------------|-------------------------|------------|---------|--------------|
| <i>Circle the appropriate ratings</i> |                         |            |         |              |
| Site Potential                        | L                       | L          | L       |              |
| Landscape Potential                   | M                       | M          | L       |              |
| Value                                 | H                       | M          | L       | <b>TOTAL</b> |
| <b>Score Based on Ratings</b>         | 6                       | 5          | 3       | <b>14</b>    |

**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                          | <b>I    II</b>           |
| Wetland of High Conservation Value | <b>I</b>                 |
| Bog                                | <b>I</b>                 |
| Mature Forest                      | <b>I</b>                 |
| Old Growth Forest                  | <b>I</b>                 |
| Coastal Lagoon                     | <b>I    II</b>           |
| Interdunal                         | <b>I   II   III   IV</b> |
| None of the above                  | N/A                      |

Wetland name or number A

## 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 ( <i>can be added to map of hydroperiods</i> )   | D 1.1, D 4.1         |          |
| Boundary of area within 150 ft of the wetland ( <i>can be added to another figure</i> )   | 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 ( <i>can be added to another figure</i> )   | R 2.4                |          |
| Plant cover of trees, shrubs, and herbaceous plants   | R 1.2, R 4.2         |          |
| Width of unit vs. width of stream ( <i>can be added to another figure</i> )   | 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 ( <i>can be added to another figure</i> )   | 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 <b>dense</b> trees, shrubs, and herbaceous plants  | S 1.3                |          |
| Plant cover of <b>dense, rigid</b> trees, shrubs, and herbaceous plants ( <i>can be added to figure above</i> )                   | S 4.1                |          |
| Boundary of 150 ft buffer ( <i>can be added to another figure</i> )   | 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 A

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

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 A

| <b>DEPRESSIONAL AND FLATS WETLANDS</b>   |  |   |
|--|--|---|
| <b>Water Quality Functions - Indicators that the site functions to improve water quality</b>   |  |   |
| <b>D 1.0. Does the site have the potential to improve water quality?</b>   |  |   |
| D 1.1. <u>Characteristics of surface water outflows from the wetland:</u><br>Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet).<br>Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet.<br>Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing<br>Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. | points = 3<br>points = 2<br>points = 1<br>points = 1 | 2 |
| D 1.2. <u>The soil 2 in below the surface (or duff layer) is true clay or true organic (use NRCS definitions).</u> Yes = 4 No = 0  |  | 0 |
| D 1.3. <u>Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes):</u><br>Wetland has persistent, ungrazed, plants > 95% of area<br>Wetland has persistent, ungrazed, plants > ½ of area<br>Wetland has persistent, ungrazed plants > 1/10 of area<br>Wetland has persistent, ungrazed plants < 1/10 of area   | points = 5<br>points = 3<br>points = 1<br>points = 0 | 0 |
| D 1.4. <u>Characteristics of seasonal ponding or inundation:</u><br><i>This is the area that is ponded for at least 2 months. See description in manual.</i><br>Area seasonally ponded is > ½ total area of wetland<br>Area seasonally ponded is > ¼ total area of wetland<br>Area seasonally ponded is < ¼ total area of wetland  | points = 4<br>points = 2<br>points = 0               | 0 |
| Total for D 1  |  | 2 |

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

|  |                |   |
|--|----------------|---|
| <b>D 2.0. Does the landscape have the potential to support the water quality function of the site?</b>                             |                |   |
| 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 | 1 |
| D 2.3. Are there septic systems within 250 ft of the wetland?  | Yes = 1 No = 0 | 0 |
| D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1-D 2.3?<br>Source _____ | Yes = 1 No = 0 | 0 |
| Total for D 2  |                | 1 |

**Rating of Landscape Potential** If score is: 3 or 4 = H X 1 or 2 = M 0 = L Record the rating on the first page

|   |                |   |
|---|----------------|---|
| <b>D 3.0. Is the water quality improvement provided by the site valuable to society?</b>  |                |   |
| 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 | 0 |
| 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   |                | 3 |

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

NOTES and FIELD OBSERVATIONS:

Wetland name or number A

**DEPRESSIONAL AND FLATS WETLANDS**

**Hydrologic Functions** - Indicators that the site functions to reduce flooding and stream degradation

|   |  |          |
|---|--|----------|
| <b>D 4.0. Does the site have the potential to reduce flooding and erosion?</b>  |  |          |
| <b>D 4.1. Characteristics of surface water outflows from the wetland:</b>   |  |          |
| Wetland is a depression or flat depression with no surface water leaving it (no outlet)   | points = 4                               | 2        |
| 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                               |          |
| <b>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.</b> |  |          |
| Marks of ponding are 3 ft or more above the surface or bottom of outlet   | points = 7                               | 0        |
| 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                               |          |
| <b>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.</b>               |  |          |
| The area of the basin is less than 10 times the area of the unit  | points = 5                               | 0        |
| 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                               |          |
| <b>Total for D 4</b>  | <b>Add the points in the boxes above</b> | <b>2</b> |

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

|   |  |          |
|---|--|----------|
| <b>D 5.0. Does the landscape have the potential to support hydrologic functions of the site?</b>  |  |          |
| <b>D 5.1. Does the wetland receive stormwater discharges?</b>   | Yes = 1 No = 0                           | 0        |
| <b>D 5.2. Is &gt;10% of the area within 150 ft of the wetland in land uses that generate excess runoff?</b>   | Yes = 1 No = 0                           | 1        |
| <b>D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses (residential at &gt;1 residence/ac, urban, commercial, agriculture, etc.)?</b> | Yes = 1 No = 0                           | 1        |
| <b>Total for D 5</b>  | <b>Add the points in the boxes above</b> | <b>2</b> |

**Rating of Landscape Potential** If score is: 3 = H X 1 or 2 = M 0 = L Record the rating on the first page

|  |  |          |
|--|--|----------|
| <b>D 6.0. Are the hydrologic functions provided by the site valuable to society?</b>   |  |          |
| <b>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.</b> |  |          |
| 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):  |  | 1        |
| • 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                               |          |
| <b>D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan?</b>  | Yes = 2 No = 0                           | 0        |
| <b>Total for D 6</b>   | <b>Add the points in the boxes above</b> | <b>1</b> |

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

Wetland name or number A

**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<sup>2</sup>.

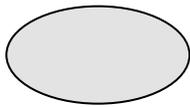
*Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle*

- If you counted: > 19 species points = 2
- 5 - 19 species points = 1
- < 5 species points = 0

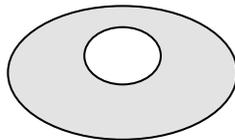
1

H 1.4. Interspersion of habitats

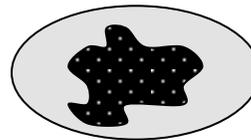
Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always high.*



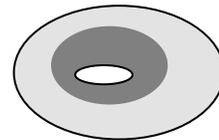
None = 0 points



Low = 1 point

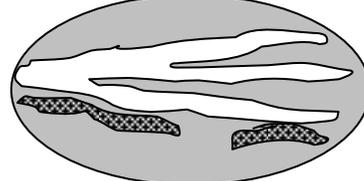
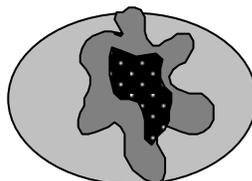
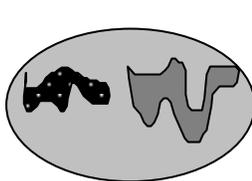


Moderate = 2 points



0

All three diagrams in this row are **HIGH** = 3points



Wetland name or number A

|  |                                   |   |
|--|-----------------------------------|---|
| <p>H 1.5. Special habitat features:</p> <p>Check the habitat features that are present in the wetland. <i>The number of checks is the number of points.</i></p> <p><input type="checkbox"/> Large, downed, woody debris within the wetland (&gt; 4 in diameter and 6 ft long).</p> <p><input type="checkbox"/> Standing snags (dbh &gt; 4 in) within the wetland</p> <p><input type="checkbox"/> Undercut banks are present for at least 6.6 ft (2 m) <b>and/or</b> 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)</p> <p><input type="checkbox"/> Stable steep banks of fine material that might be used by beaver or muskrat for denning (&gt; 30 degree slope) OR signs of recent beaver activity are present (<i>cut shrubs or trees that have not yet weathered where wood is exposed</i>)</p> <p><input type="checkbox"/> At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (<i>structures for egg-laying by amphibians</i>)</p> <p><input type="checkbox"/> Invasive plants cover less than 25% of the wetland area in every stratum of plants (<i>see H 1.1 for list of strata</i>)</p> |                                   | 0 |
| 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 X 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?  |                                   |    |
| <p>H 2.1. Accessible habitat (include <i>only habitat that directly abuts wetland unit</i>).</p> <p>Calculate: <input type="text" value="4.91"/> % undisturbed habitat + [(% moderate and low intensity land uses) <input type="text" value="0.57"/> /2] = <u>5.195</u> %</p> <p>If total accessible habitat is:</p> <p>&gt; 1/3 (33.3%) of 1 km Polygon <span style="float: right;">points = 3</span></p> <p>20-33% of 1 km Polygon <span style="float: right;">points = 2</span></p> <p>10-19% of 1 km Polygon <span style="float: right;">points = 1</span></p> <p>&lt; 10% of 1 km Polygon <span style="float: right;">points = 0</span></p>        |                                   | 0  |
| <p>H 2.2. Undisturbed habitat in 1 km Polygon around the wetland.</p> <p>Calculate: <input type="text" value="7.39"/> % undisturbed habitat + [(% moderate and low intensity land uses) <input type="text" value="4.47"/> /2] = <u>9.625</u> %</p> <p>Undisturbed habitat &gt; 50% of Polygon <span style="float: right;">points = 3</span></p> <p>Undisturbed habitat 10-50% and in 1-3 patches <span style="float: right;">points = 2</span></p> <p>Undisturbed habitat 10-50% and &gt; 3 patches <span style="float: right;">points = 1</span></p> <p>Undisturbed habitat &lt; 10% of 1 km Polygon <span style="float: right;">points = 0</span></p> |                                   | 0  |
| <p>H 2.3. Land use intensity in 1 km Polygon: If</p> <p>&gt; 50% of 1 km Polygon is high intensity land use <span style="float: right;">points = (- 2)</span></p> <p>≤ 50% of 1 km Polygon is high intensity <span style="float: right;">points = 0</span></p>  |                                   | -2 |
| Total for H 2   | Add the points in the boxes above | -2 |

**Rating of Landscape Potential** If score is: 4-6 = H 1-3 = M X < 1 = L *Record the rating on the first page*

|  |  |   |
|--|--|---|
| H 3.0. Is the habitat provided by the site valuable to society?  |  |   |
| <p>H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? <i>Choose only the highest score that applies to the wetland being rated.</i></p> <p>Site meets ANY of the following criteria: <span style="float: right;">points = 2</span></p> <p>— It has 3 or more priority habitats within 100 m (see next page)</p> <p>— It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists)</p> <p>— It is mapped as a location for an individual WDFW priority species</p> <p>— It is a Wetland of High Conservation Value as determined by the Department of Natural Resources</p> <p>— 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</p> <p>Site has 1 or 2 priority habitats (listed on next page) within 100 m <span style="float: right;">points = 1</span></p> <p>Site does not meet any of the criteria above <span style="float: right;">points = 0</span></p> |  | 0 |

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

Wetland name or number   A  

## 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 multi-layered 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 A

**CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS**

| Wetland Type  | Category |
|---|----------|
| <i>Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.</i>   |          |
| <p><b>SC 1.0. Estuarine wetlands</b></p> <p>Does the wetland meet the following criteria for Estuarine wetlands?</p> <p><input type="checkbox"/> The dominant water regime is tidal,<br/> <input type="checkbox"/> Vegetated, and<br/> <input type="checkbox"/> With a salinity greater than 0.5 ppt <span style="float: right;"><input type="checkbox"/> Yes –Go to <b>SC 1.1</b> <input checked="" type="checkbox"/> No= <b>Not an estuarine wetland</b></span></p>   |          |
| <p>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?<br/> <span style="float: right;"><input type="checkbox"/> Yes = <b>Category I</b> <input type="checkbox"/> No - Go to <b>SC 1.2</b></span></p>  |          |
| <p>SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions?</p> <p><input type="checkbox"/> 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 <i>Spartina</i>, see page 25)<br/> <input type="checkbox"/> At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or unmowed grassland.<br/> <input type="checkbox"/> The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. <span style="float: right;"><input type="checkbox"/> Yes = <b>Category I</b> <input type="checkbox"/> No = <b>Category II</b></span></p>  |          |
| <p><b>SC 2.0. Wetlands of High Conservation Value (WHCV)</b></p> <p>SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? <span style="float: right;"><input type="checkbox"/> Yes – Go to <b>SC 2.2</b> <input checked="" type="checkbox"/> No – Go to <b>SC 2.3</b></span></p> <p>SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value?<br/> <span style="float: right;"><input type="checkbox"/> Yes = <b>Category I</b> <input checked="" type="checkbox"/> No = <b>Not a WHCV</b></span></p> <p>SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland?<br/> <a href="http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf">http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf</a><br/> <span style="float: right;"><input type="checkbox"/> Yes – <b>Contact WNHP/WDNR and go to SC 2.4</b> <input checked="" type="checkbox"/> No = <b>Not a WHCV</b></span></p> <p>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? <span style="float: right;"><input type="checkbox"/> Yes = <b>Category I</b> <input checked="" type="checkbox"/> No = <b>Not a WHCV</b></span></p>  |          |
| <p><b>SC 3.0. Bogs</b></p> <p>Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? <i>Use the key below. If you answer YES you will still need to rate the wetland based on its functions.</i></p> <p>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? <span style="float: right;"><input type="checkbox"/> Yes – Go to <b>SC 3.3</b> <input checked="" type="checkbox"/> No – Go to <b>SC 3.2</b></span></p> <p>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? <span style="float: right;"><input type="checkbox"/> Yes – Go to <b>SC 3.3</b> <input checked="" type="checkbox"/> No = <b>Is not a bog</b></span></p> <p>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? <span style="float: right;"><input type="checkbox"/> Yes = <b>Is a Category I bog</b> <input type="checkbox"/> No – Go to <b>SC 3.4</b></span><br/> <b>NOTE:</b> 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.</p> <p>SC 3.4. Is an area with peats or mucks forested (&gt; 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? <span style="float: right;"><input type="checkbox"/> Yes = <b>Is a Category I bog</b> <input type="checkbox"/> No = <b>Is not a bog</b></span></p> |          |

Wetland name or number A

|  |  |
|--|--|
| <p><b>SC 4.0. Forested Wetlands</b></p> <p>Does the wetland have at least <u>1 contiguous acre</u> of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? <b><i>If you answer YES you will still need to rate the wetland based on its functions.</i></b></p> <ul style="list-style-type: none"> <li>— <b>Old-growth forests</b> (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.</li> <li>— <b>Mature forests</b> (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).</li> </ul> <p style="text-align: right;"><input type="checkbox"/> Yes = <b>Category I</b>   <input checked="" type="checkbox"/> No = <b>Not a forested wetland for this section</b></p>   |  |
| <p><b>SC 5.0. Wetlands in Coastal Lagoons</b></p> <p>Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?</p> <ul style="list-style-type: none"> <li>— 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</li> <li>— The lagoon in which the wetland is located contains ponded water that is saline or brackish (&gt; 0.5 ppt) during most of the year in at least a portion of the lagoon (<i>needs to be measured near the bottom</i>)</li> </ul> <p style="text-align: right;"><input type="checkbox"/> Yes – Go to <b>SC 5.1</b>   <input checked="" type="checkbox"/> No = <b>Not a wetland in a coastal lagoon</b></p> <p>SC 5.1. Does the wetland meet all of the following three conditions?</p> <ul style="list-style-type: none"> <li>— 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).</li> <li>— At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or unmowed grassland.</li> <li>— The wetland is larger than 1/10 ac (4350 ft<sup>2</sup>)</li> </ul> <p style="text-align: right;"><input type="checkbox"/> Yes = <b>Category I</b>   <input type="checkbox"/> No = <b>Category II</b></p>   |  |
| <p><b>SC 6.0. Interdunal Wetlands</b></p> <p>Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? <b><i>If you answer yes you will still need to rate the wetland based on its habitat functions.</i></b></p> <p>In practical terms that means the following geographic areas:</p> <ul style="list-style-type: none"> <li>— Long Beach Peninsula: Lands west of SR 103</li> <li>— Grayland-Westport: Lands west of SR 105</li> <li>— Ocean Shores-Copalis: Lands west of SR 115 and SR 109</li> </ul> <p style="text-align: right;"><input type="checkbox"/> Yes – Go to <b>SC 6.1</b>   <input checked="" type="checkbox"/> No = <b>not an interdunal wetland for rating</b></p> <p>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)? <span style="float: right;"><input type="checkbox"/> Yes = <b>Category I</b>   <input type="checkbox"/> No – Go to <b>SC 6.2</b></span></p> <p>SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? <span style="float: right;"><input type="checkbox"/> Yes = <b>Category II</b>   <input type="checkbox"/> No – Go to <b>SC 6.3</b></span></p> <p>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? <span style="float: right;"><input type="checkbox"/> Yes = <b>Category III</b>   <input type="checkbox"/> No = <b>Category IV</b></span></p> |  |
| <p><b>Category of wetland based on Special Characteristics</b></p> <p>If you answered No for all types, enter "Not Applicable" on Summary Form</p>   |  |

Wetland name or number A

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Wetland name or number B

## RATING SUMMARY – Western Washington

Name of wetland (or ID #): B Date of site visit: 06/19/18  
 Rated by Richard Peel Trained by Ecology?  Yes  No Date of training 6/29/16  
 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 Esri Arc GIS

**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 |              |
|---------------------------------------|-------------------------|------------|---------|--------------|
| <i>Circle the appropriate ratings</i> |                         |            |         |              |
| Site Potential                        | L                       | L          | L       |              |
| Landscape Potential                   | M                       | M          | L       |              |
| Value                                 | H                       | M          | L       | <b>TOTAL</b> |
| <b>Score Based on Ratings</b>         | 6                       | 5          | 3       | <b>14</b>    |

**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                  | N/A               |

Wetland name or number B

## 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 ( <i>can be added to map of hydroperiods</i> )   | D 1.1, D 4.1         |          |
| Boundary of area within 150 ft of the wetland ( <i>can be added to another figure</i> )   | 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 ( <i>can be added to another figure</i> )   | R 2.4                |          |
| Plant cover of trees, shrubs, and herbaceous plants   | R 1.2, R 4.2         |          |
| Width of unit vs. width of stream ( <i>can be added to another figure</i> )   | 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 ( <i>can be added to another figure</i> )   | 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 <b>dense</b> trees, shrubs, and herbaceous plants  | S 1.3                |          |
| Plant cover of <b>dense, rigid</b> trees, shrubs, and herbaceous plants ( <i>can be added to figure above</i> )                   | S 4.1                |          |
| Boundary of 150 ft buffer ( <i>can be added to another figure</i> )   | 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 B

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

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 B

| <b>DEPRESSIONAL AND FLATS WETLANDS</b>   |  |   |
|--|--|---|
| <b>Water Quality Functions - Indicators that the site functions to improve water quality</b>   |  |   |
| <b>D 1.0. Does the site have the potential to improve water quality?</b>   |  |   |
| D 1.1. <u>Characteristics of surface water outflows from the wetland:</u><br>Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet).<br>Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet.<br>Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing<br>Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. | points = 3<br>points = 2<br>points = 1<br>points = 1 | 2 |
| D 1.2. <u>The soil 2 in below the surface (or duff layer) is true clay or true organic (use NRCS definitions).</u> Yes = 4 No = 0  |  | 0 |
| D 1.3. <u>Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes):</u><br>Wetland has persistent, ungrazed, plants > 95% of area<br>Wetland has persistent, ungrazed, plants > 1/2 of area<br>Wetland has persistent, ungrazed plants > 1/10 of area<br>Wetland has persistent, ungrazed plants < 1/10 of area   | points = 5<br>points = 3<br>points = 1<br>points = 0 | 0 |
| D 1.4. <u>Characteristics of seasonal ponding or inundation:</u><br><i>This is the area that is ponded for at least 2 months. See description in manual.</i><br>Area seasonally ponded is > 1/2 total area of wetland<br>Area seasonally ponded is > 1/4 total area of wetland<br>Area seasonally ponded is < 1/4 total area of wetland  | points = 4<br>points = 2<br>points = 0               | 0 |
| Total for D 1  |  | 2 |

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

|  |                |   |
|--|----------------|---|
| <b>D 2.0. Does the landscape have the potential to support the water quality function of the site?</b>                             |                |   |
| 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 | 1 |
| D 2.3. Are there septic systems within 250 ft of the wetland?  | Yes = 1 No = 0 | 0 |
| D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1-D 2.3?<br>Source _____ | Yes = 1 No = 0 | 0 |
| Total for D 2  |                | 1 |

**Rating of Landscape Potential** If score is: 3 or 4 = H X 1 or 2 = M 0 = L Record the rating on the first page

|   |                |   |
|---|----------------|---|
| <b>D 3.0. Is the water quality improvement provided by the site valuable to society?</b>  |                |   |
| 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 | 0 |
| 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   |                | 3 |

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

NOTES and FIELD OBSERVATIONS:

Wetland name or number B

**DEPRESSIONAL AND FLATS WETLANDS**

**Hydrologic Functions** - Indicators that the site functions to reduce flooding and stream degradation

|   |  |          |
|---|--|----------|
| <b>D 4.0. Does the site have the potential to reduce flooding and erosion?</b>  |  |          |
| <b>D 4.1. Characteristics of surface water outflows from the wetland:</b>   |  |          |
| Wetland is a depression or flat depression with no surface water leaving it (no outlet)   | points = 4                               | 2        |
| 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                               |          |
| <b>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.</b> |  |          |
| Marks of ponding are 3 ft or more above the surface or bottom of outlet   | points = 7                               | 0        |
| 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                               |          |
| <b>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.</b>               |  |          |
| The area of the basin is less than 10 times the area of the unit  | points = 5                               | 0        |
| 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                               |          |
| <b>Total for D 4</b>  | <b>Add the points in the boxes above</b> | <b>2</b> |

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

|   |  |          |
|---|--|----------|
| <b>D 5.0. Does the landscape have the potential to support hydrologic functions of the site?</b>  |  |          |
| <b>D 5.1. Does the wetland receive stormwater discharges?</b>   | Yes = 1 No = 0                           | 0        |
| <b>D 5.2. Is &gt;10% of the area within 150 ft of the wetland in land uses that generate excess runoff?</b>   | Yes = 1 No = 0                           | 1        |
| <b>D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses (residential at &gt;1 residence/ac, urban, commercial, agriculture, etc.)?</b> | Yes = 1 No = 0                           | 1        |
| <b>Total for D 5</b>  | <b>Add the points in the boxes above</b> | <b>2</b> |

**Rating of Landscape Potential** If score is: 3 = H X 1 or 2 = M 0 = L Record the rating on the first page

|  |  |          |
|--|--|----------|
| <b>D 6.0. Are the hydrologic functions provided by the site valuable to society?</b>   |  |          |
| <b>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.</b> |  |          |
| 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):  |  | 1        |
| • 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                               |          |
| <b>D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan?</b>  | Yes = 2 No = 0                           | 0        |
| <b>Total for D 6</b>   | <b>Add the points in the boxes above</b> | <b>1</b> |

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

Wetland name or number B

**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<sup>2</sup>.

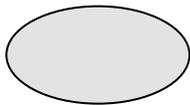
*Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle*

- If you counted: > 19 species points = 2
- 5 - 19 species points = 1
- < 5 species points = 0

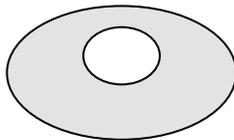
1

**H 1.4. Interspersion of habitats**

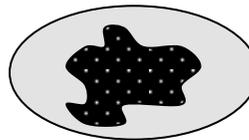
Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always high.*



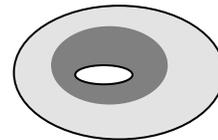
None = 0 points



Low = 1 point

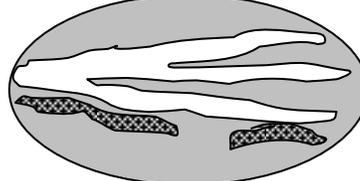
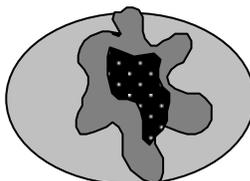
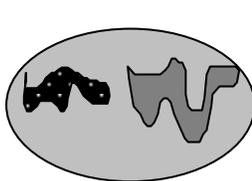


Moderate = 2 points



0

All three diagrams in this row are **HIGH** = 3points



Wetland name or number B

|  |                                   |   |
|--|-----------------------------------|---|
| <p>H 1.5. Special habitat features:</p> <p>Check the habitat features that are present in the wetland. <i>The number of checks is the number of points.</i></p> <p><input type="checkbox"/> Large, downed, woody debris within the wetland (&gt; 4 in diameter and 6 ft long).</p> <p><input type="checkbox"/> Standing snags (dbh &gt; 4 in) within the wetland</p> <p><input type="checkbox"/> Undercut banks are present for at least 6.6 ft (2 m) <b>and/or</b> 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)</p> <p><input type="checkbox"/> Stable steep banks of fine material that might be used by beaver or muskrat for denning (&gt; 30 degree slope) OR signs of recent beaver activity are present (<i>cut shrubs or trees that have not yet weathered where wood is exposed</i>)</p> <p><input type="checkbox"/> At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (<i>structures for egg-laying by amphibians</i>)</p> <p><input type="checkbox"/> Invasive plants cover less than 25% of the wetland area in every stratum of plants (<i>see H 1.1 for list of strata</i>)</p> |                                   | 0 |
| 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 X 0-6 = L *Record the rating on the first page*

|  |                                   |    |
|--|-----------------------------------|----|
| <p>H 2.0. Does the landscape have the potential to support the habitat functions of the site?</p>  |                                   |    |
| <p>H 2.1. Accessible habitat (include <i>only habitat that directly abuts wetland unit</i>).</p> <p>Calculate: <input type="text" value="4.91"/> % undisturbed habitat + [(% moderate and low intensity land uses) <input type="text" value="0.57"/> /2] = 5.195 %</p> <p>If total accessible habitat is:</p> <p>&gt; 1/3 (33.3%) of 1 km Polygon <span style="float: right;">points = 3</span></p> <p>20-33% of 1 km Polygon <span style="float: right;">points = 2</span></p> <p>10-19% of 1 km Polygon <span style="float: right;">points = 1</span></p> <p>&lt; 10% of 1 km Polygon <span style="float: right;">points = 0</span></p>        |                                   | 0  |
| <p>H 2.2. Undisturbed habitat in 1 km Polygon around the wetland.</p> <p>Calculate: <input type="text" value="7.39"/> % undisturbed habitat + [(% moderate and low intensity land uses) <input type="text" value="4.47"/> /2] = 9.625 %</p> <p>Undisturbed habitat &gt; 50% of Polygon <span style="float: right;">points = 3</span></p> <p>Undisturbed habitat 10-50% and in 1-3 patches <span style="float: right;">points = 2</span></p> <p>Undisturbed habitat 10-50% and &gt; 3 patches <span style="float: right;">points = 1</span></p> <p>Undisturbed habitat &lt; 10% of 1 km Polygon <span style="float: right;">points = 0</span></p> |                                   | 0  |
| <p>H 2.3. Land use intensity in 1 km Polygon: If</p> <p>&gt; 50% of 1 km Polygon is high intensity land use <span style="float: right;">points = (- 2)</span></p> <p>≤ 50% of 1 km Polygon is high intensity <span style="float: right;">points = 0</span></p>   |                                   | -2 |
| Total for H 2  | Add the points in the boxes above | -2 |

**Rating of Landscape Potential** If score is: 4-6 = H 1-3 = M X < 1 = L *Record the rating on the first page*

|  |  |   |
|--|--|---|
| <p>H 3.0. Is the habitat provided by the site valuable to society?</p>   |  |   |
| <p>H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? <i>Choose only the highest score that applies to the wetland being rated.</i></p> <p>Site meets ANY of the following criteria: <span style="float: right;">points = 2</span></p> <p>— It has 3 or more priority habitats within 100 m (see next page)</p> <p>— It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists)</p> <p>— It is mapped as a location for an individual WDFW priority species</p> <p>— It is a Wetland of High Conservation Value as determined by the Department of Natural Resources</p> <p>— 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</p> <p>Site has 1 or 2 priority habitats (listed on next page) within 100 m <span style="float: right;">points = 1</span></p> <p>Site does not meet any of the criteria above <span style="float: right;">points = 0</span></p> |  | 0 |

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

Wetland name or number   B  

## 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 multi-layered 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 B

**CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS**

| Wetland Type  | Category |
|---|----------|
| <i>Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.</i>   |          |
| <p><b>SC 1.0. Estuarine wetlands</b></p> <p>Does the wetland meet the following criteria for Estuarine wetlands?</p> <p><input type="checkbox"/> The dominant water regime is tidal,<br/> <input type="checkbox"/> Vegetated, and<br/> <input type="checkbox"/> With a salinity greater than 0.5 ppt      <input type="checkbox"/> Yes –Go to <b>SC 1.1</b>   <input checked="" type="checkbox"/> No= <b>Not an estuarine wetland</b></p>   |          |
| <p>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?<br/> <input type="checkbox"/> Yes = <b>Category I</b>   <input type="checkbox"/> No - Go to <b>SC 1.2</b></p>   |          |
| <p>SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions?</p> <p><input type="checkbox"/> 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 <i>Spartina</i>, see page 25)<br/> <input type="checkbox"/> At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or unmowed grassland.<br/> <input type="checkbox"/> The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.      <input type="checkbox"/> Yes = <b>Category I</b>   <input type="checkbox"/> No = <b>Category II</b></p>  |          |
| <p><b>SC 2.0. Wetlands of High Conservation Value (WHCV)</b></p> <p>SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value?      <input type="checkbox"/> Yes – Go to <b>SC 2.2</b>   <input checked="" type="checkbox"/> No – Go to <b>SC 2.3</b></p> <p>SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value?<br/> <input type="checkbox"/> Yes = <b>Category I</b>   <input checked="" type="checkbox"/> No = <b>Not a WHCV</b></p> <p>SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland?<br/> <a href="http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf">http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf</a><br/> <input type="checkbox"/> Yes – <b>Contact WNHP/WDNR and go to SC 2.4</b>   <input checked="" type="checkbox"/> No = <b>Not a WHCV</b></p> <p>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?      <input type="checkbox"/> Yes = <b>Category I</b>   <input checked="" type="checkbox"/> No = <b>Not a WHCV</b></p>  |          |
| <p><b>SC 3.0. Bogs</b></p> <p>Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? <i>Use the key below. If you answer YES you will still need to rate the wetland based on its functions.</i></p> <p>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?      <input type="checkbox"/> Yes – Go to <b>SC 3.3</b>   <input checked="" type="checkbox"/> No – Go to <b>SC 3.2</b></p> <p>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?      <input type="checkbox"/> Yes – Go to <b>SC 3.3</b>   <input checked="" type="checkbox"/> No = <b>Is not a bog</b></p> <p>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?      <input type="checkbox"/> Yes = <b>Is a Category I bog</b>   <input type="checkbox"/> No – Go to <b>SC 3.4</b><br/> <b>NOTE:</b> 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.</p> <p>SC 3.4. Is an area with peats or mucks forested (&gt; 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?<br/> <input type="checkbox"/> Yes = <b>Is a Category I bog</b>   <input type="checkbox"/> No = <b>Is not a bog</b></p> |          |

Wetland name or number B

|  |  |
|--|--|
| <p><b>SC 4.0. Forested Wetlands</b></p> <p>Does the wetland have at least <u>1 contiguous acre</u> of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? <b><i>If you answer YES you will still need to rate the wetland based on its functions.</i></b></p> <ul style="list-style-type: none"> <li>— <b>Old-growth forests</b> (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.</li> <li>— <b>Mature forests</b> (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).</li> </ul> <p style="text-align: right;"><input type="checkbox"/> Yes = <b>Category I</b>    <input checked="" type="checkbox"/> No = <b>Not a forested wetland for this section</b></p>  |  |
| <p><b>SC 5.0. Wetlands in Coastal Lagoons</b></p> <p>Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?</p> <ul style="list-style-type: none"> <li>— 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</li> <li>— The lagoon in which the wetland is located contains ponded water that is saline or brackish (&gt; 0.5 ppt) during most of the year in at least a portion of the lagoon (<i>needs to be measured near the bottom</i>)</li> </ul> <p style="text-align: right;"><input type="checkbox"/> Yes – Go to <b>SC 5.1</b>    <input checked="" type="checkbox"/> No = <b>Not a wetland in a coastal lagoon</b></p> <p>SC 5.1. Does the wetland meet all of the following three conditions?</p> <ul style="list-style-type: none"> <li>— 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).</li> <li>— At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or unmowed grassland.</li> <li>— The wetland is larger than 1/10 ac (4350 ft<sup>2</sup>)</li> </ul> <p style="text-align: right;"><input type="checkbox"/> Yes = <b>Category I</b>    <input type="checkbox"/> No = <b>Category II</b></p>   |  |
| <p><b>SC 6.0. Interdunal Wetlands</b></p> <p>Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? <b><i>If you answer yes you will still need to rate the wetland based on its habitat functions.</i></b></p> <p>In practical terms that means the following geographic areas:</p> <ul style="list-style-type: none"> <li>— Long Beach Peninsula: Lands west of SR 103</li> <li>— Grayland-Westport: Lands west of SR 105</li> <li>— Ocean Shores-Copalis: Lands west of SR 115 and SR 109</li> </ul> <p style="text-align: right;"><input type="checkbox"/> Yes – Go to <b>SC 6.1</b>    <input checked="" type="checkbox"/> No = <b>not an interdunal wetland for rating</b></p> <p>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)? <span style="float: right;"><input type="checkbox"/> Yes = <b>Category I</b>    <input type="checkbox"/> No – Go to <b>SC 6.2</b></span></p> <p>SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? <span style="float: right;"><input type="checkbox"/> Yes = <b>Category II</b>    <input type="checkbox"/> No – Go to <b>SC 6.3</b></span></p> <p>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? <span style="float: right;"><input type="checkbox"/> Yes = <b>Category III</b>    <input type="checkbox"/> No = <b>Category IV</b></span></p> |  |
| <p><b>Category of wetland based on Special Characteristics</b></p> <p>If you answered No for all types, enter "Not Applicable" on Summary Form</p>   |  |

Wetland name or number B

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Wetland name or number C

## RATING SUMMARY – Western Washington

Name of wetland (or ID #): C Date of site visit: 06/20/18  
 Rated by Emily Swaim Trained by Ecology?  Yes  No Date of training 3/31/2018  
 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** III (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 |              |
|---------------------------------------|-------------------------|------------|---------|--------------|
| <i>Circle the appropriate ratings</i> |                         |            |         |              |
| Site Potential                        | M                       | L          | L       |              |
| Landscape Potential                   | M                       | M          | L       |              |
| Value                                 | H                       | M          | M       | <b>TOTAL</b> |
| <b>Score Based on Ratings</b>         | 7                       | 5          | 4       | 16           |

**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                  | N/A         |

Wetland name or number C

## 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 ( <i>can be added to map of hydroperiods</i> )   | D 1.1, D 4.1         |          |
| Boundary of area within 150 ft of the wetland ( <i>can be added to another figure</i> )   | 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 ( <i>can be added to another figure</i> )   | R 2.4                |          |
| Plant cover of trees, shrubs, and herbaceous plants   | R 1.2, R 4.2         |          |
| Width of unit vs. width of stream ( <i>can be added to another figure</i> )   | 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 ( <i>can be added to another figure</i> )   | 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 <b>dense</b> trees, shrubs, and herbaceous plants  | S 1.3                |          |
| Plant cover of <b>dense, rigid</b> trees, shrubs, and herbaceous plants ( <i>can be added to figure above</i> )                   | S 4.1                |          |
| Boundary of 150 ft buffer ( <i>can be added to another figure</i> )   | 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 C

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

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 C

| <b>DEPRESSIONAL AND FLATS WETLANDS</b>   |  |
|--|--|
| <b>Water Quality Functions - Indicators that the site functions to improve water quality</b>   |  |
| <b>D 1.0. Does the site have the potential to improve water quality?</b>   |  |
| D 1.1. <u>Characteristics of surface water outflows from the wetland:</u><br>Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet).<br>Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet.<br>Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing<br>Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. | points = 3<br>points = 2<br>points = 1<br>points = 1<br><br><b>3</b> |
| D 1.2. <u>The soil 2 in below the surface (or duff layer) is true clay or true organic (use NRCS definitions).</u> Yes = 4 No = 0  | <b>0</b>   |
| D 1.3. <u>Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes):</u><br>Wetland has persistent, ungrazed, plants > 95% of area<br>Wetland has persistent, ungrazed, plants > ½ of area<br>Wetland has persistent, ungrazed plants > 1/10 of area<br>Wetland has persistent, ungrazed plants < 1/10 of area   | points = 5<br>points = 3<br>points = 1<br>points = 0<br><br><b>1</b> |
| D 1.4. <u>Characteristics of seasonal ponding or inundation:</u><br><i>This is the area that is ponded for at least 2 months. See description in manual.</i><br>Area seasonally ponded is > ½ total area of wetland<br>Area seasonally ponded is > ¼ total area of wetland<br>Area seasonally ponded is < ¼ total area of wetland  | points = 4<br>points = 2<br>points = 0<br><br><b>2</b>               |
| <b>Total for D 1</b>   | <b>6</b><br>Add the points in the boxes above                        |

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

|  |   |
|--|---|
| <b>D 2.0. Does the landscape have the potential to support the water quality function of the site?</b>                             |   |
| D 2.1. Does the wetland unit receive stormwater discharges?  | Yes = 1 No = 0<br><b>0</b>                    |
| D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants?                                    | Yes = 1 No = 0<br><b>1</b>                    |
| D 2.3. Are there septic systems within 250 ft of the wetland?  | Yes = 1 No = 0<br><b>0</b>                    |
| 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?<br>Source _____ | Yes = 1 No = 0<br><b>0</b>                    |
| <b>Total for D 2</b>   | <b>1</b><br>Add the points in the boxes above |

**Rating of Landscape Potential** If score is: 3 or 4 = H X 1 or 2 = M 0 = L Record the rating on the first page

|   |   |
|---|---|
| <b>D 3.0. Is the water quality improvement provided by the site valuable to society?</b>  |   |
| 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<br><b>0</b>                    |
| 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<br><b>1</b>                    |
| 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<br><b>2</b>                    |
| <b>Total for D 3</b>  | <b>3</b><br>Add the points in the boxes above |

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

NOTES and FIELD OBSERVATIONS:

Wetland name or number C

**DEPRESSIONAL AND FLATS WETLANDS**

**Hydrologic Functions - Indicators that the site functions to reduce flooding and stream degradation**

|   |  |          |
|---|--|----------|
| <b>D 4.0. Does the site have the potential to reduce flooding and erosion?</b>  |  |          |
| <b>D 4.1. Characteristics of surface water outflows from the wetland:</b>   |  |          |
| Wetland is a depression or flat depression with no surface water leaving it (no outlet)   | points = 4                               | 2        |
| 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                               |          |
| <b>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.</b> |  |          |
| Marks of ponding are 3 ft or more above the surface or bottom of outlet   | points = 7                               | 3        |
| 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                               |          |
| <b>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.</b>               |  |          |
| The area of the basin is less than 10 times the area of the unit  | points = 5                               | 0        |
| 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                               |          |
| <b>Total for D 4</b>  | <b>Add the points in the boxes above</b> | <b>5</b> |

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

|   |  |          |
|---|--|----------|
| <b>D 5.0. Does the landscape have the potential to support hydrologic functions of the site?</b>  |  |          |
| <b>D 5.1. Does the wetland receive stormwater discharges?</b>   | Yes = 1 No = 0                           | 0        |
| <b>D 5.2. Is &gt;10% of the area within 150 ft of the wetland in land uses that generate excess runoff?</b>   | Yes = 1 No = 0                           | 1        |
| <b>D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses (residential at &gt;1 residence/ac, urban, commercial, agriculture, etc.)?</b> | Yes = 1 No = 0                           | 1        |
| <b>Total for D 5</b>  | <b>Add the points in the boxes above</b> | <b>2</b> |

**Rating of Landscape Potential** If score is: 3 = H X 1 or 2 = M 0 = L Record the rating on the first page

|  |  |          |
|--|--|----------|
| <b>D 6.0. Are the hydrologic functions provided by the site valuable to society?</b>   |  |          |
| <b>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.</b> |  |          |
| 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):  |  | 1        |
| • 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                               |          |
| <b>D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan?</b>  | Yes = 2 No = 0                           | 0        |
| <b>Total for D 6</b>   | <b>Add the points in the boxes above</b> | <b>1</b> |

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

Wetland name or number C

**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

1

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<sup>2</sup>.

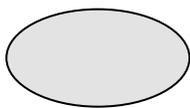
*Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle*

- If you counted: > 19 species points = 2
- 5 - 19 species points = 1
- < 5 species points = 0

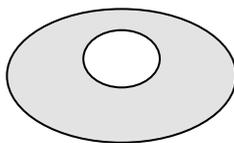
1

H 1.4. Interspersion of habitats

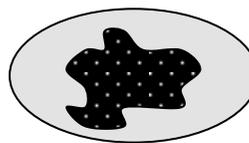
Decide from the diagrams below whether interspersions among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always high.*



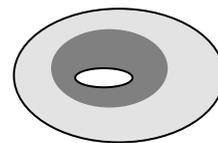
None = 0 points



Low = 1 point

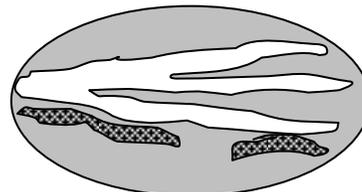
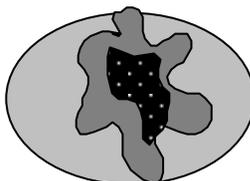
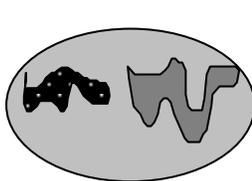


Moderate = 2 points



1

All three diagrams in this row are **HIGH** = 3points



Wetland name or number C

|  |   |
|--|---|
| <p>H 1.5. Special habitat features:</p> <p>Check the habitat features that are present in the wetland. <i>The number of checks is the number of points.</i></p> <p><input checked="" type="checkbox"/> Large, downed, woody debris within the wetland (&gt; 4 in diameter and 6 ft long).</p> <p><input checked="" type="checkbox"/> Standing snags (dbh &gt; 4 in) within the wetland</p> <p><input type="checkbox"/> Undercut banks are present for at least 6.6 ft (2 m) <b>and/or</b> 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)</p> <p><input type="checkbox"/> Stable steep banks of fine material that might be used by beaver or muskrat for denning (&gt; 30 degree slope) OR signs of recent beaver activity are present (<i>cut shrubs or trees that have not yet weathered where wood is exposed</i>)</p> <p><input type="checkbox"/> At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (<i>structures for egg-laying by amphibians</i>)</p> <p><input type="checkbox"/> Invasive plants cover less than 25% of the wetland area in every stratum of plants (<i>see H 1.1 for list of strata</i>)</p> | 2 |
| <p>Total for H 1</p>   | 6 |

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

|   |    |
|---|----|
| <p>H 2.0. Does the landscape have the potential to support the habitat functions of the site?</p>   |    |
| <p>H 2.1. Accessible habitat (include <i>only habitat that directly abuts wetland unit</i>).</p> <p>Calculate: <input type="text" value="4.91"/> % undisturbed habitat + [(% moderate and low intensity land uses) <input type="text" value="0.57"/> /2] = <u>5.195</u> %</p> <p>If total accessible habitat is:</p> <p>&gt; 1/3 (33.3%) of 1 km Polygon <span style="float: right;">points = 3</span></p> <p>20-33% of 1 km Polygon <span style="float: right;">points = 2</span></p> <p>10-19% of 1 km Polygon <span style="float: right;">points = 1</span></p> <p>&lt; 10% of 1 km Polygon <span style="float: right;">points = 0</span></p>        | 0  |
| <p>H 2.2. Undisturbed habitat in 1 km Polygon around the wetland.</p> <p>Calculate: <input type="text" value="7.39"/> % undisturbed habitat + [(% moderate and low intensity land uses) <input type="text" value="4.47"/> /2] = <u>9.625</u> %</p> <p>Undisturbed habitat &gt; 50% of Polygon <span style="float: right;">points = 3</span></p> <p>Undisturbed habitat 10-50% and in 1-3 patches <span style="float: right;">points = 2</span></p> <p>Undisturbed habitat 10-50% and &gt; 3 patches <span style="float: right;">points = 1</span></p> <p>Undisturbed habitat &lt; 10% of 1 km Polygon <span style="float: right;">points = 0</span></p> | 0  |
| <p>H 2.3. Land use intensity in 1 km Polygon: If</p> <p>&gt; 50% of 1 km Polygon is high intensity land use <span style="float: right;">points = (- 2)</span></p> <p>≤ 50% of 1 km Polygon is high intensity <span style="float: right;">points = 0</span></p>  | -2 |
| <p>Total for H 2</p>  | -2 |

**Rating of Landscape Potential** If score is: 4-6 = H 1-3 = M  < 1 = L *Record the rating on the first page*

|  |   |
|--|---|
| <p>H 3.0. Is the habitat provided by the site valuable to society?</p>   |   |
| <p>H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? <i>Choose only the highest score that applies to the wetland being rated.</i></p> <p>Site meets ANY of the following criteria: <span style="float: right;">points = 2</span></p> <p>— It has 3 or more priority habitats within 100 m (see next page)</p> <p>— It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists)</p> <p>— It is mapped as a location for an individual WDFW priority species</p> <p>— It is a Wetland of High Conservation Value as determined by the Department of Natural Resources</p> <p>— 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</p> <p><input checked="" type="checkbox"/> Site has 1 or 2 priority habitats (listed on next page) within 100 m <span style="float: right;">points = 1</span></p> <p>Site does not meet any of the criteria above <span style="float: right;">points = 0</span></p> | 1 |

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

Wetland name or number C

## 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 multi-layered 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 C

**CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS**

| Wetland Type  | Category |
|---|----------|
| <i>Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.</i>   |          |
| <p><b>SC 1.0. Estuarine wetlands</b></p> <p>Does the wetland meet the following criteria for Estuarine wetlands?</p> <p><input type="checkbox"/> The dominant water regime is tidal,<br/> <input type="checkbox"/> Vegetated, and<br/> <input type="checkbox"/> With a salinity greater than 0.5 ppt      <input type="checkbox"/> Yes –Go to <b>SC 1.1</b>   <input checked="" type="checkbox"/> No= <b>Not an estuarine wetland</b></p>   |          |
| <p>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?<br/> <input type="checkbox"/> Yes = <b>Category I</b>   <input type="checkbox"/> No - Go to <b>SC 1.2</b></p>   |          |
| <p>SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions?</p> <p><input type="checkbox"/> 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 <i>Spartina</i>, see page 25)<br/> <input type="checkbox"/> At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or unmowed grassland.<br/> <input type="checkbox"/> The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.      <input type="checkbox"/> Yes = <b>Category I</b>   <input type="checkbox"/> No = <b>Category II</b></p>  |          |
| <p><b>SC 2.0. Wetlands of High Conservation Value (WHCV)</b></p> <p>SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value?      <input type="checkbox"/> Yes – Go to <b>SC 2.2</b>   <input checked="" type="checkbox"/> No – Go to <b>SC 2.3</b></p> <p>SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value?<br/> <input type="checkbox"/> Yes = <b>Category I</b>   <input checked="" type="checkbox"/> No = <b>Not a WHCV</b></p> <p>SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland?<br/> <a href="http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf">http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf</a><br/> <input type="checkbox"/> Yes – <b>Contact WNHP/WDNR and go to SC 2.4</b>   <input checked="" type="checkbox"/> No = <b>Not a WHCV</b></p> <p>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?      <input type="checkbox"/> Yes = <b>Category I</b>   <input checked="" type="checkbox"/> No = <b>Not a WHCV</b></p>  |          |
| <p><b>SC 3.0. Bogs</b></p> <p>Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? <i>Use the key below. If you answer YES you will still need to rate the wetland based on its functions.</i></p> <p>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?      <input type="checkbox"/> Yes – Go to <b>SC 3.3</b>   <input checked="" type="checkbox"/> No – Go to <b>SC 3.2</b></p> <p>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?      <input type="checkbox"/> Yes – Go to <b>SC 3.3</b>   <input checked="" type="checkbox"/> No = <b>Is not a bog</b></p> <p>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?      <input type="checkbox"/> Yes = <b>Is a Category I bog</b>   <input type="checkbox"/> No – Go to <b>SC 3.4</b><br/> <b>NOTE:</b> 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.</p> <p>SC 3.4. Is an area with peats or mucks forested (&gt; 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?<br/> <input type="checkbox"/> Yes = <b>Is a Category I bog</b>   <input type="checkbox"/> No = <b>Is not a bog</b></p> |          |

Wetland name or number C

|  |  |
|--|--|
| <p><b>SC 4.0. Forested Wetlands</b></p> <p>Does the wetland have at least <u>1 contiguous acre</u> of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? <b><i>If you answer YES you will still need to rate the wetland based on its functions.</i></b></p> <ul style="list-style-type: none"> <li>— <b>Old-growth forests</b> (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.</li> <li>— <b>Mature forests</b> (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).</li> </ul> <p style="text-align: right;"><input type="checkbox"/> Yes = <b>Category I</b>   <input checked="" type="checkbox"/> No = <b>Not a forested wetland for this section</b></p>   |  |
| <p><b>SC 5.0. Wetlands in Coastal Lagoons</b></p> <p>Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?</p> <ul style="list-style-type: none"> <li>— 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</li> <li>— The lagoon in which the wetland is located contains ponded water that is saline or brackish (&gt; 0.5 ppt) during most of the year in at least a portion of the lagoon (<i>needs to be measured near the bottom</i>)</li> </ul> <p style="text-align: right;"><input type="checkbox"/> Yes – Go to <b>SC 5.1</b>   <input checked="" type="checkbox"/> No = <b>Not a wetland in a coastal lagoon</b></p> <p>SC 5.1. Does the wetland meet all of the following three conditions?</p> <ul style="list-style-type: none"> <li>— 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).</li> <li>— At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or unmowed grassland.</li> <li>— The wetland is larger than 1/10 ac (4350 ft<sup>2</sup>)</li> </ul> <p style="text-align: right;"><input type="checkbox"/> Yes = <b>Category I</b>   <input type="checkbox"/> No = <b>Category II</b></p>   |  |
| <p><b>SC 6.0. Interdunal Wetlands</b></p> <p>Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? <b><i>If you answer yes you will still need to rate the wetland based on its habitat functions.</i></b></p> <p>In practical terms that means the following geographic areas:</p> <ul style="list-style-type: none"> <li>— Long Beach Peninsula: Lands west of SR 103</li> <li>— Grayland-Westport: Lands west of SR 105</li> <li>— Ocean Shores-Copalis: Lands west of SR 115 and SR 109</li> </ul> <p style="text-align: right;"><input type="checkbox"/> Yes – Go to <b>SC 6.1</b>   <input checked="" type="checkbox"/> No = <b>not an interdunal wetland for rating</b></p> <p>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)? <span style="float: right;"><input type="checkbox"/> Yes = <b>Category I</b>   <input type="checkbox"/> No – Go to <b>SC 6.2</b></span></p> <p>SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? <span style="float: right;"><input type="checkbox"/> Yes = <b>Category II</b>   <input type="checkbox"/> No – Go to <b>SC 6.3</b></span></p> <p>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? <span style="float: right;"><input type="checkbox"/> Yes = <b>Category III</b>   <input type="checkbox"/> No = <b>Category IV</b></span></p> |  |
| <p><b>Category of wetland based on Special Characteristics</b></p> <p>If you answered No for all types, enter "Not Applicable" on Summary Form</p>   |  |

Wetland name or number C

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Wetland name or number D

## RATING SUMMARY – Western Washington

Name of wetland (or ID #): D Date of site visit: 06/20/18  
 Rated by Emily Swaim Trained by Ecology?  Yes  No Date of training 3/31/2016  
 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 ESRI 2018

**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 |              |
|---------------------------------------|-------------------------|------------|---------|--------------|
| <i>Circle the appropriate ratings</i> |                         |            |         |              |
| Site Potential                        | L                       | L          | L       |              |
| Landscape Potential                   | M                       | M          | L       |              |
| Value                                 | H                       | M          | L       | <b>TOTAL</b> |
| <b>Score Based on Ratings</b>         | 6                       | 5          | 3       | 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                  | N/A               |

Wetland name or number D

## 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 ( <i>can be added to map of hydroperiods</i> )   | D 1.1, D 4.1         |          |
| Boundary of area within 150 ft of the wetland ( <i>can be added to another figure</i> )   | 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 ( <i>can be added to another figure</i> )   | R 2.4                |          |
| Plant cover of trees, shrubs, and herbaceous plants   | R 1.2, R 4.2         |          |
| Width of unit vs. width of stream ( <i>can be added to another figure</i> )   | 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 ( <i>can be added to another figure</i> )   | 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 <b>dense</b> trees, shrubs, and herbaceous plants  | S 1.3                |          |
| Plant cover of <b>dense, rigid</b> trees, shrubs, and herbaceous plants ( <i>can be added to figure above</i> )                   | S 4.1                |          |
| Boundary of 150 ft buffer ( <i>can be added to another figure</i> )   | 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 D

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

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 D

| <b>DEPRESSIONAL AND FLATS WETLANDS</b>   |  |   |
|--|--|---|
| <b>Water Quality Functions - Indicators that the site functions to improve water quality</b>   |  |   |
| <b>D 1.0. Does the site have the potential to improve water quality?</b>   |  |   |
| D 1.1. <u>Characteristics of surface water outflows from the wetland:</u><br>Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet).<br>Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet.<br>Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing<br>Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. | points = 3<br>points = 2<br>points = 1<br>points = 1 | 2 |
| D 1.2. <u>The soil 2 in below the surface (or duff layer) is true clay or true organic (use NRCS definitions).</u> Yes = 4 No = 0  |  | 0 |
| D 1.3. <u>Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes):</u><br>Wetland has persistent, ungrazed, plants > 95% of area<br>Wetland has persistent, ungrazed, plants > ½ of area<br>Wetland has persistent, ungrazed plants > 1/10 of area<br>Wetland has persistent, ungrazed plants < 1/10 of area   | points = 5<br>points = 3<br>points = 1<br>points = 0 | 1 |
| D 1.4. <u>Characteristics of seasonal ponding or inundation:</u><br><i>This is the area that is ponded for at least 2 months. See description in manual.</i><br>Area seasonally ponded is > ½ total area of wetland<br>Area seasonally ponded is > ¼ total area of wetland<br>Area seasonally ponded is < ¼ total area of wetland  | points = 4<br>points = 2<br>points = 0               | 0 |
| Total for D 1  |  | 3 |

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

|  |                |   |
|--|----------------|---|
| <b>D 2.0. Does the landscape have the potential to support the water quality function of the site?</b>                             |                |   |
| 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 | 1 |
| D 2.3. Are there septic systems within 250 ft of the wetland?  | Yes = 1 No = 0 | 0 |
| D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1-D 2.3?<br>Source _____ | Yes = 1 No = 0 | 0 |
| Total for D 2  |                | 1 |

**Rating of Landscape Potential** If score is: 3 or 4 = H X 1 or 2 = M 0 = L Record the rating on the first page

|   |                |   |
|---|----------------|---|
| <b>D 3.0. Is the water quality improvement provided by the site valuable to society?</b>  |                |   |
| 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 | 0 |
| 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   |                | 3 |

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

NOTES and FIELD OBSERVATIONS:

Wetland name or number D

**DEPRESSIONAL AND FLATS WETLANDS**

**Hydrologic Functions - Indicators that the site functions to reduce flooding and stream degradation**

|   |  |          |
|---|--|----------|
| <b>D 4.0. Does the site have the potential to reduce flooding and erosion?</b>  |  |          |
| <b>D 4.1. Characteristics of surface water outflows from the wetland:</b>   |  |          |
| Wetland is a depression or flat depression with no surface water leaving it (no outlet)   | points = 4                               | 2        |
| 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                               |          |
| <b>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.</b> |  |          |
| Marks of ponding are 3 ft or more above the surface or bottom of outlet   | points = 7                               | 0        |
| 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                               |          |
| <b>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.</b>               |  |          |
| The area of the basin is less than 10 times the area of the unit  | points = 5                               | 0        |
| 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                               |          |
| <b>Total for D 4</b>  | <b>Add the points in the boxes above</b> | <b>2</b> |

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

|   |  |          |
|---|--|----------|
| <b>D 5.0. Does the landscape have the potential to support hydrologic functions of the site?</b>  |  |          |
| <b>D 5.1. Does the wetland receive stormwater discharges?</b>   | Yes = 1 No = 0                           | 0        |
| <b>D 5.2. Is &gt;10% of the area within 150 ft of the wetland in land uses that generate excess runoff?</b>   | Yes = 1 No = 0                           | 0        |
| <b>D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses (residential at &gt;1 residence/ac, urban, commercial, agriculture, etc.)?</b> | Yes = 1 No = 0                           | 1        |
| <b>Total for D 5</b>  | <b>Add the points in the boxes above</b> | <b>1</b> |

**Rating of Landscape Potential** If score is: 3 = H X 1 or 2 = M 0 = L Record the rating on the first page

|  |  |          |
|--|--|----------|
| <b>D 6.0. Are the hydrologic functions provided by the site valuable to society?</b>   |  |          |
| <b>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.</b> |  |          |
| 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):  |  | 1        |
| • 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                               |          |
| <b>D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan?</b>  | Yes = 2 No = 0                           | 0        |
| <b>Total for D 6</b>   | <b>Add the points in the boxes above</b> | <b>1</b> |

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

Wetland name or number D

**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**

0

H 1.3. Richness of plant species

Count the number of plant species in the wetland that cover at least 10 ft<sup>2</sup>.

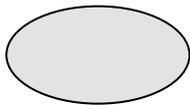
*Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle*

- If you counted: > 19 species points = 2
- 5 - 19 species points = 1
- < 5 species points = 0

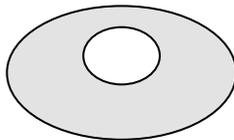
1

H 1.4. Interspersion of habitats

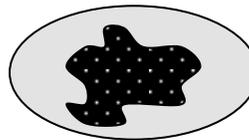
Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always high.*



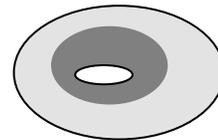
None = 0 points



Low = 1 point

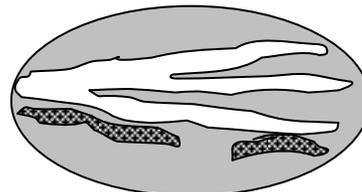
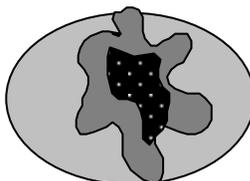
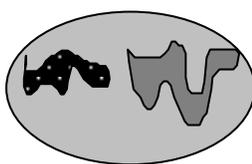


Moderate = 2 points



0

All three diagrams in this row are **HIGH** = 3points



Wetland name or number D

|   |   |
|---|---|
| <p>H 1.5. Special habitat features:<br/>         Check the habitat features that are present in the wetland. <i>The number of checks is the number of points.</i><br/> <input checked="" type="checkbox"/> Large, downed, woody debris within the wetland (&gt; 4 in diameter and 6 ft long).<br/> <input type="checkbox"/> Standing snags (dbh &gt; 4 in) within the wetland<br/> <input type="checkbox"/> Undercut banks are present for at least 6.6 ft (2 m) <b>and/or</b> 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)<br/> <input type="checkbox"/> Stable steep banks of fine material that might be used by beaver or muskrat for denning (&gt; 30 degree slope) OR signs of recent beaver activity are present (<i>cut shrubs or trees that have not yet weathered where wood is exposed</i>)<br/> <input type="checkbox"/> At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (<i>structures for egg-laying by amphibians</i>)<br/> <input type="checkbox"/> Invasive plants cover less than 25% of the wetland area in every stratum of plants (<i>see H 1.1 for list of strata</i>)</p> | 1 |
| <p>Total for H 1 <span style="float: right;">Add the points in the boxes above</span></p>   | 2 |

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

|  |    |
|--|----|
| <p>H 2.0. Does the landscape have the potential to support the habitat functions of the site?</p>  |    |
| <p>H 2.1. Accessible habitat (include <i>only habitat that directly abuts wetland unit</i>).<br/> <i>Calculate:</i> <input type="text" value="4.91"/> % undisturbed habitat + [(% moderate and low intensity land uses) <input type="text" value="0.57"/> /2] = <u>5.195</u> %<br/>         If total accessible habitat is:<br/>         &gt; 1/3 (33.3%) of 1 km Polygon <span style="float: right;">points = 3</span><br/>         20-33% of 1 km Polygon <span style="float: right;">points = 2</span><br/>         10-19% of 1 km Polygon <span style="float: right;">points = 1</span><br/>         &lt; 10% of 1 km Polygon <span style="float: right;">points = 0</span></p>  | 0  |
| <p>H 2.2. Undisturbed habitat in 1 km Polygon around the wetland.<br/> <i>Calculate:</i> <input type="text" value="7.39"/> % undisturbed habitat + [(% moderate and low intensity land uses) <input type="text" value="4.47"/> /2] = <u>9.625</u> %<br/>         Undisturbed habitat &gt; 50% of Polygon <span style="float: right;">points = 3</span><br/>         Undisturbed habitat 10-50% and in 1-3 patches <span style="float: right;">points = 2</span><br/>         Undisturbed habitat 10-50% and &gt; 3 patches <span style="float: right;">points = 1</span><br/>         Undisturbed habitat &lt; 10% of 1 km Polygon <span style="float: right;">points = 0</span></p> | 0  |
| <p>H 2.3. Land use intensity in 1 km Polygon: If<br/>         &gt; 50% of 1 km Polygon is high intensity land use <span style="float: right;">points = (- 2)</span><br/>         ≤ 50% of 1 km Polygon is high intensity <span style="float: right;">points = 0</span></p>   | -2 |
| <p>Total for H 2 <span style="float: right;">Add the points in the boxes above</span></p>  | -2 |

**Rating of Landscape Potential** If score is: 4-6 = H 1-3 = M  < 1 = L *Record the rating on the first page*

|  |   |
|--|---|
| <p>H 3.0. Is the habitat provided by the site valuable to society?</p>   |   |
| <p>H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? <i>Choose only the highest score that applies to the wetland being rated.</i><br/>         Site meets ANY of the following criteria: <span style="float: right;">points = 2</span><br/>         — It has 3 or more priority habitats within 100 m (see next page)<br/>         — It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists)<br/>         — It is mapped as a location for an individual WDFW priority species<br/>         — It is a Wetland of High Conservation Value as determined by the Department of Natural Resources<br/>         — 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<br/>         Site has 1 or 2 priority habitats (listed on next page) within 100 m <span style="float: right;">points = 1</span><br/>         Site does not meet any of the criteria above <span style="float: right;">points = 0</span></p> | 0 |

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

Wetland name or number   D  

## 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 multi-layered 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 D

**CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS**

| Wetland Type  | Category |
|---|----------|
| <i>Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.</i>   |          |
| <p><b>SC 1.0. Estuarine wetlands</b></p> <p>Does the wetland meet the following criteria for Estuarine wetlands?</p> <p><input type="checkbox"/> The dominant water regime is tidal,<br/> <input type="checkbox"/> Vegetated, and<br/> <input type="checkbox"/> With a salinity greater than 0.5 ppt <span style="float: right;"><input type="checkbox"/> Yes –Go to <b>SC 1.1</b> <input checked="" type="checkbox"/> No= <b>Not an estuarine wetland</b></span></p>   |          |
| <p>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?<br/> <span style="float: right;"><input type="checkbox"/> Yes = <b>Category I</b> <input type="checkbox"/> No - Go to <b>SC 1.2</b></span></p>  |          |
| <p>SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions?</p> <p><input type="checkbox"/> 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 <i>Spartina</i>, see page 25)<br/> <input type="checkbox"/> At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or unmowed grassland.<br/> <input type="checkbox"/> The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. <span style="float: right;"><input type="checkbox"/> Yes = <b>Category I</b> <input type="checkbox"/> No = <b>Category II</b></span></p>  |          |
| <p><b>SC 2.0. Wetlands of High Conservation Value (WHCV)</b></p> <p>SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? <span style="float: right;"><input type="checkbox"/> Yes – Go to <b>SC 2.2</b> <input checked="" type="checkbox"/> No – Go to <b>SC 2.3</b></span></p> <p>SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value?<br/> <span style="float: right;"><input type="checkbox"/> Yes = <b>Category I</b> <input checked="" type="checkbox"/> No = <b>Not a WHCV</b></span></p> <p>SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland?<br/> <a href="http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf">http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf</a><br/> <span style="float: right;"><input type="checkbox"/> Yes – <b>Contact WNHP/WDNR and go to SC 2.4</b> <input checked="" type="checkbox"/> No = <b>Not a WHCV</b></span></p> <p>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? <span style="float: right;"><input type="checkbox"/> Yes = <b>Category I</b> <input checked="" type="checkbox"/> No = <b>Not a WHCV</b></span></p>  |          |
| <p><b>SC 3.0. Bogs</b></p> <p>Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? <i>Use the key below. If you answer YES you will still need to rate the wetland based on its functions.</i></p> <p>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? <span style="float: right;"><input type="checkbox"/> Yes – Go to <b>SC 3.3</b> <input checked="" type="checkbox"/> No – Go to <b>SC 3.2</b></span></p> <p>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? <span style="float: right;"><input type="checkbox"/> Yes – Go to <b>SC 3.3</b> <input checked="" type="checkbox"/> No = <b>Is not a bog</b></span></p> <p>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? <span style="float: right;"><input type="checkbox"/> Yes = <b>Is a Category I bog</b> <input type="checkbox"/> No – Go to <b>SC 3.4</b></span><br/> <b>NOTE:</b> 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.</p> <p>SC 3.4. Is an area with peats or mucks forested (&gt; 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? <span style="float: right;"><input type="checkbox"/> Yes = <b>Is a Category I bog</b> <input type="checkbox"/> No = <b>Is not a bog</b></span></p> |          |

Wetland name or number D

|   |  |
|---|--|
| <p><b>SC 4.0. Forested Wetlands</b></p> <p>Does the wetland have at least <u>1 contiguous acre</u> of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? <b><i>If you answer YES you will still need to rate the wetland based on its functions.</i></b></p> <ul style="list-style-type: none"><li>— <b>Old-growth forests</b> (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.</li><li>— <b>Mature forests</b> (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).</li></ul> <p><input type="checkbox"/> Yes = <b>Category I</b>   <input checked="" type="checkbox"/> No = <b>Not a forested wetland for this section</b></p>  |  |
| <p><b>SC 5.0. Wetlands in Coastal Lagoons</b></p> <p>Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?</p> <ul style="list-style-type: none"><li>— 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</li><li>— The lagoon in which the wetland is located contains ponded water that is saline or brackish (&gt; 0.5 ppt) during most of the year in at least a portion of the lagoon (<i>needs to be measured near the bottom</i>)</li></ul> <p><input type="checkbox"/> Yes – Go to <b>SC 5.1</b>   <input checked="" type="checkbox"/> No = <b>Not a wetland in a coastal lagoon</b></p> <p>SC 5.1. Does the wetland meet all of the following three conditions?</p> <ul style="list-style-type: none"><li>— 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).</li><li>— At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or unmowed grassland.</li><li>— The wetland is larger than 1/10 ac (4350 ft<sup>2</sup>)</li></ul> <p><input type="checkbox"/> Yes = <b>Category I</b>   <input type="checkbox"/> No = <b>Category II</b></p>     |  |
| <p><b>SC 6.0. Interdunal Wetlands</b></p> <p>Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? <b><i>If you answer yes you will still need to rate the wetland based on its habitat functions.</i></b></p> <p>In practical terms that means the following geographic areas:</p> <ul style="list-style-type: none"><li>— Long Beach Peninsula: Lands west of SR 103</li><li>— Grayland-Westport: Lands west of SR 105</li><li>— Ocean Shores-Copalis: Lands west of SR 115 and SR 109</li></ul> <p><input type="checkbox"/> Yes – Go to <b>SC 6.1</b>   <input checked="" type="checkbox"/> No = <b>not an interdunal wetland for rating</b></p> <p>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)?      <input type="checkbox"/> Yes = <b>Category I</b>   <input type="checkbox"/> No – Go to <b>SC 6.2</b></p> <p>SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger?      <input type="checkbox"/> Yes = <b>Category II</b>   <input type="checkbox"/> No – Go to <b>SC 6.3</b></p> <p>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?      <input type="checkbox"/> Yes = <b>Category III</b>   <input type="checkbox"/> No = <b>Category IV</b></p> |  |
| <p><b>Category of wetland based on Special Characteristics</b></p> <p>If you answered No for all types, enter "Not Applicable" on Summary Form</p>  |  |

Wetland name or number D

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Wetland name or number E

## RATING SUMMARY – Western Washington

Name of wetland (or ID #): E Date of site visit: 06/20/18  
 Rated by Emily Swaim Trained by Ecology?  Yes  No Date of training 3/31/2016  
 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 ESRI 2018

**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 |              |
|---------------------------------------|-------------------------|------------|---------|--------------|
| <i>Circle the appropriate ratings</i> |                         |            |         |              |
| Site Potential                        | L                       | L          | L       |              |
| Landscape Potential                   | M                       | M          | L       |              |
| Value                                 | H                       | M          | L       | <b>TOTAL</b> |
| <b>Score Based on Ratings</b>         | 6                       | 5          | 3       | 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                  | N/A               |

Wetland name or number E

## 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 ( <i>can be added to map of hydroperiods</i> )   | D 1.1, D 4.1         |          |
| Boundary of area within 150 ft of the wetland ( <i>can be added to another figure</i> )   | 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 ( <i>can be added to another figure</i> )   | R 2.4                |          |
| Plant cover of trees, shrubs, and herbaceous plants   | R 1.2, R 4.2         |          |
| Width of unit vs. width of stream ( <i>can be added to another figure</i> )   | 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 ( <i>can be added to another figure</i> )   | 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 <b>dense</b> trees, shrubs, and herbaceous plants  | S 1.3                |          |
| Plant cover of <b>dense, rigid</b> trees, shrubs, and herbaceous plants ( <i>can be added to figure above</i> )                   | S 4.1                |          |
| Boundary of 150 ft buffer ( <i>can be added to another figure</i> )   | 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 E

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

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 E

| <b>DEPRESSIONAL AND FLATS WETLANDS</b>   |  |   |
|--|--|---|
| <b>Water Quality Functions - Indicators that the site functions to improve water quality</b>   |  |   |
| <b>D 1.0. Does the site have the potential to improve water quality?</b>   |  |   |
| D 1.1. <u>Characteristics of surface water outflows from the wetland:</u><br>Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet).<br>Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet.<br>Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing<br>Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. | points = 3<br>points = 2<br>points = 1<br>points = 1 | 2 |
| D 1.2. <u>The soil 2 in below the surface (or duff layer) is true clay or true organic (use NRCS definitions).</u> Yes = 4 No = 0  |  | 0 |
| D 1.3. <u>Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes):</u><br>Wetland has persistent, ungrazed, plants > 95% of area<br>Wetland has persistent, ungrazed, plants > ½ of area<br>Wetland has persistent, ungrazed plants > 1/10 of area<br>Wetland has persistent, ungrazed plants < 1/10 of area   | points = 5<br>points = 3<br>points = 1<br>points = 0 | 0 |
| D 1.4. <u>Characteristics of seasonal ponding or inundation:</u><br><i>This is the area that is ponded for at least 2 months. See description in manual.</i><br>Area seasonally ponded is > ½ total area of wetland<br>Area seasonally ponded is > ¼ total area of wetland<br>Area seasonally ponded is < ¼ total area of wetland  | points = 4<br>points = 2<br>points = 0               | 0 |
| Total for D 1  |  | 2 |

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

|  |                |   |
|--|----------------|---|
| <b>D 2.0. Does the landscape have the potential to support the water quality function of the site?</b>                             |                |   |
| 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 | 1 |
| D 2.3. Are there septic systems within 250 ft of the wetland?  | Yes = 1 No = 0 | 0 |
| D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1-D 2.3?<br>Source _____ | Yes = 1 No = 0 | 0 |
| Total for D 2  |                | 1 |

**Rating of Landscape Potential** If score is: 3 or 4 = H X 1 or 2 = M 0 = L Record the rating on the first page

|   |                |   |
|---|----------------|---|
| <b>D 3.0. Is the water quality improvement provided by the site valuable to society?</b>  |                |   |
| 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 | 0 |
| 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   |                | 3 |

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

NOTES and FIELD OBSERVATIONS:

Wetland name or number E

**DEPRESSIONAL AND FLATS WETLANDS**

**Hydrologic Functions** - Indicators that the site functions to reduce flooding and stream degradation

|   |  |          |
|---|--|----------|
| <b>D 4.0. Does the site have the potential to reduce flooding and erosion?</b>  |  |          |
| <b>D 4.1. Characteristics of surface water outflows from the wetland:</b>   |  |          |
| Wetland is a depression or flat depression with no surface water leaving it (no outlet)   | points = 4                               | 2        |
| 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                               |          |
| <b>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.</b> |  |          |
| Marks of ponding are 3 ft or more above the surface or bottom of outlet   | points = 7                               | 0        |
| 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                               |          |
| <b>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.</b>               |  |          |
| The area of the basin is less than 10 times the area of the unit  | points = 5                               | 0        |
| 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                               |          |
| <b>Total for D 4</b>  | <b>Add the points in the boxes above</b> | <b>2</b> |

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

|   |  |          |
|---|--|----------|
| <b>D 5.0. Does the landscape have the potential to support hydrologic functions of the site?</b>  |  |          |
| <b>D 5.1. Does the wetland receive stormwater discharges?</b>   | Yes = 1 No = 0                           | 0        |
| <b>D 5.2. Is &gt;10% of the area within 150 ft of the wetland in land uses that generate excess runoff?</b>   | Yes = 1 No = 0                           | 1        |
| <b>D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses (residential at &gt;1 residence/ac, urban, commercial, agriculture, etc.)?</b> | Yes = 1 No = 0                           | 1        |
| <b>Total for D 5</b>  | <b>Add the points in the boxes above</b> | <b>2</b> |

**Rating of Landscape Potential** If score is: 3 = H X 1 or 2 = M 0 = L Record the rating on the first page

|  |  |          |
|--|--|----------|
| <b>D 6.0. Are the hydrologic functions provided by the site valuable to society?</b>   |  |          |
| <b>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.</b> |  |          |
| 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):  |  | 1        |
| • 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                               |          |
| <b>D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan?</b>  | Yes = 2 No = 0                           | 0        |
| <b>Total for D 6</b>   | <b>Add the points in the boxes above</b> | <b>1</b> |

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

Wetland name or number E

**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<sup>2</sup>.

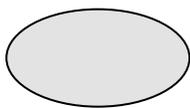
*Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle*

- If you counted: > 19 species points = 2
- 5 - 19 species points = 1
- < 5 species points = 0

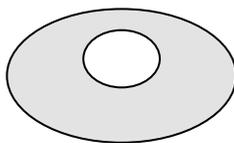
1

H 1.4. Interspersion of habitats

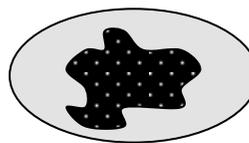
Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always high.*



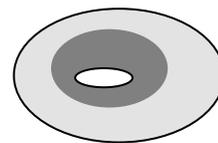
None = 0 points



Low = 1 point

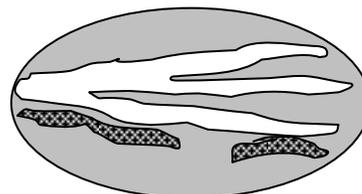
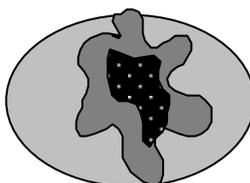
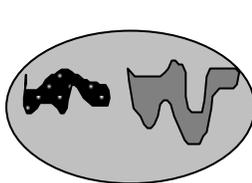


Moderate = 2 points



0

All three diagrams in this row are **HIGH** = 3points



Wetland name or number E

|  |                                   |   |
|--|-----------------------------------|---|
| <p>H 1.5. Special habitat features:</p> <p>Check the habitat features that are present in the wetland. <i>The number of checks is the number of points.</i></p> <p><input type="checkbox"/> Large, downed, woody debris within the wetland (&gt; 4 in diameter and 6 ft long).</p> <p><input type="checkbox"/> Standing snags (dbh &gt; 4 in) within the wetland</p> <p><input type="checkbox"/> Undercut banks are present for at least 6.6 ft (2 m) <b>and/or</b> 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)</p> <p><input type="checkbox"/> Stable steep banks of fine material that might be used by beaver or muskrat for denning (&gt; 30 degree slope) OR signs of recent beaver activity are present (<i>cut shrubs or trees that have not yet weathered where wood is exposed</i>)</p> <p><input type="checkbox"/> At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (<i>structures for egg-laying by amphibians</i>)</p> <p><input type="checkbox"/> Invasive plants cover less than 25% of the wetland area in every stratum of plants (<i>see H 1.1 for list of strata</i>)</p> |                                   | 0 |
| 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*

|   |                                   |   |
|---|-----------------------------------|---|
| <p>H 2.0. Does the landscape have the potential to support the habitat functions of the site?</p>   |                                   |   |
| <p>H 2.1. Accessible habitat (include <i>only habitat that directly abuts wetland unit</i>).</p> <p>Calculate: <input type="text" value="4.91"/> % undisturbed habitat + [(% moderate and low intensity land uses) <input type="text" value="0.57"/> /2] = <u>5.195</u> %</p> <p>If total accessible habitat is:</p> <p>&gt; 1/3 (33.3%) of 1 km Polygon <span style="float: right;">points = 3</span></p> <p>20-33% of 1 km Polygon <span style="float: right;">points = 2</span></p> <p>10-19% of 1 km Polygon <span style="float: right;">points = 1</span></p> <p>&lt; 10% of 1 km Polygon <span style="float: right;">points = 0</span></p>        |                                   | 0 |
| <p>H 2.2. Undisturbed habitat in 1 km Polygon around the wetland.</p> <p>Calculate: <input type="text" value="7.39"/> % undisturbed habitat + [(% moderate and low intensity land uses) <input type="text" value="4.47"/> /2] = <u>9.625</u> %</p> <p>Undisturbed habitat &gt; 50% of Polygon <span style="float: right;">points = 3</span></p> <p>Undisturbed habitat 10-50% and in 1-3 patches <span style="float: right;">points = 2</span></p> <p>Undisturbed habitat 10-50% and &gt; 3 patches <span style="float: right;">points = 1</span></p> <p>Undisturbed habitat &lt; 10% of 1 km Polygon <span style="float: right;">points = 0</span></p> |                                   | 0 |
| <p>H 2.3. Land use intensity in 1 km Polygon: If</p> <p>&gt; 50% of 1 km Polygon is high intensity land use <span style="float: right;">points = (- 2)</span></p> <p>≤ 50% of 1 km Polygon is high intensity <span style="float: right;">points = 0</span></p>  |                                   | 0 |
| Total for H 2   | Add the points in the boxes above | 0 |

**Rating of Landscape Potential** If score is: 4-6 = H 1-3 = M  < 1 = L *Record the rating on the first page*

|  |  |   |
|--|--|---|
| <p>H 3.0. Is the habitat provided by the site valuable to society?</p>   |  |   |
| <p>H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? <i>Choose only the highest score that applies to the wetland being rated.</i></p> <p>Site meets ANY of the following criteria: <span style="float: right;">points = 2</span></p> <p>— It has 3 or more priority habitats within 100 m (see next page)</p> <p>— It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists)</p> <p>— It is mapped as a location for an individual WDFW priority species</p> <p>— It is a Wetland of High Conservation Value as determined by the Department of Natural Resources</p> <p>— 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</p> <p>Site has 1 or 2 priority habitats (listed on next page) within 100 m <span style="float: right;">points = 1</span></p> <p>Site does not meet any of the criteria above <span style="float: right;">points = 0</span></p> |  | 0 |

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

Wetland name or number   E  

## 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 multi-layered 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 E

**CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS**

| Wetland Type  | Category |
|---|----------|
| <i>Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.</i>   |          |
| <p><b>SC 1.0. Estuarine wetlands</b></p> <p>Does the wetland meet the following criteria for Estuarine wetlands?</p> <p><input type="checkbox"/> The dominant water regime is tidal,<br/> <input type="checkbox"/> Vegetated, and<br/> <input type="checkbox"/> With a salinity greater than 0.5 ppt</p> <p style="text-align: right;"><input type="checkbox"/> Yes –Go to <b>SC 1.1</b>   <input checked="" type="checkbox"/> No= <b>Not an estuarine wetland</b></p>  |          |
| <p>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?</p> <p style="text-align: right;"><input type="checkbox"/> Yes = <b>Category I</b>   <input type="checkbox"/> No - Go to <b>SC 1.2</b></p>  |          |
| <p>SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions?</p> <p><input type="checkbox"/> 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 <i>Spartina</i>, see page 25)</p> <p><input type="checkbox"/> At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or unmowed grassland.</p> <p><input type="checkbox"/> The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.</p> <p style="text-align: right;"><input type="checkbox"/> Yes = <b>Category I</b>   <input type="checkbox"/> No = <b>Category II</b></p>   |          |
| <p><b>SC 2.0. Wetlands of High Conservation Value (WHCV)</b></p> <p>SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value?</p> <p style="text-align: right;"><input type="checkbox"/> Yes – Go to <b>SC 2.2</b>   <input checked="" type="checkbox"/> No – Go to <b>SC 2.3</b></p> <p>SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value?</p> <p style="text-align: right;"><input type="checkbox"/> Yes = <b>Category I</b>   <input checked="" type="checkbox"/> No = <b>Not a WHCV</b></p> <p>SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland?<br/> <a href="http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf">http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf</a></p> <p style="text-align: right;"><input type="checkbox"/> Yes – <b>Contact WNHP/WDNR and go to SC 2.4</b>   <input checked="" type="checkbox"/> No = <b>Not a WHCV</b></p> <p>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?</p> <p style="text-align: right;"><input type="checkbox"/> Yes = <b>Category I</b>   <input checked="" type="checkbox"/> No = <b>Not a WHCV</b></p>  |          |
| <p><b>SC 3.0. Bogs</b></p> <p>Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? <i>Use the key below. If you answer YES you will still need to rate the wetland based on its functions.</i></p> <p>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?</p> <p style="text-align: right;"><input type="checkbox"/> Yes – Go to <b>SC 3.3</b>   <input checked="" type="checkbox"/> No – Go to <b>SC 3.2</b></p> <p>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?</p> <p style="text-align: right;"><input type="checkbox"/> Yes – Go to <b>SC 3.3</b>   <input checked="" type="checkbox"/> No = <b>Is not a bog</b></p> <p>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?</p> <p style="text-align: right;"><input type="checkbox"/> Yes = <b>Is a Category I bog</b>   <input type="checkbox"/> No – Go to <b>SC 3.4</b></p> <p><b>NOTE:</b> 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.</p> <p>SC 3.4. Is an area with peats or mucks forested (&gt; 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?</p> <p style="text-align: right;"><input type="checkbox"/> Yes = <b>Is a Category I bog</b>   <input type="checkbox"/> No = <b>Is not a bog</b></p> |          |

Wetland name or number E

|  |  |
|--|--|
| <p><b>SC 4.0. Forested Wetlands</b></p> <p>Does the wetland have at least <u>1 contiguous acre</u> of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? <b><i>If you answer YES you will still need to rate the wetland based on its functions.</i></b></p> <ul style="list-style-type: none"> <li>— <b>Old-growth forests</b> (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.</li> <li>— <b>Mature forests</b> (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).</li> </ul> <p style="text-align: right;"><input type="checkbox"/> Yes = <b>Category I</b>   <input checked="" type="checkbox"/> No = <b>Not a forested wetland for this section</b></p>   |  |
| <p><b>SC 5.0. Wetlands in Coastal Lagoons</b></p> <p>Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?</p> <ul style="list-style-type: none"> <li>— 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</li> <li>— The lagoon in which the wetland is located contains ponded water that is saline or brackish (&gt; 0.5 ppt) during most of the year in at least a portion of the lagoon (<i>needs to be measured near the bottom</i>)</li> </ul> <p style="text-align: right;"><input type="checkbox"/> Yes – Go to <b>SC 5.1</b>   <input checked="" type="checkbox"/> No = <b>Not a wetland in a coastal lagoon</b></p> <p>SC 5.1. Does the wetland meet all of the following three conditions?</p> <ul style="list-style-type: none"> <li>— 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).</li> <li>— 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.</li> <li>— The wetland is larger than 1/10 ac (4350 ft<sup>2</sup>)</li> </ul> <p style="text-align: right;"><input type="checkbox"/> Yes = <b>Category I</b>   <input type="checkbox"/> No = <b>Category II</b></p>  |  |
| <p><b>SC 6.0. Interdunal Wetlands</b></p> <p>Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? <b><i>If you answer yes you will still need to rate the wetland based on its habitat functions.</i></b></p> <p>In practical terms that means the following geographic areas:</p> <ul style="list-style-type: none"> <li>— Long Beach Peninsula: Lands west of SR 103</li> <li>— Grayland-Westport: Lands west of SR 105</li> <li>— Ocean Shores-Copalis: Lands west of SR 115 and SR 109</li> </ul> <p style="text-align: right;"><input type="checkbox"/> Yes – Go to <b>SC 6.1</b>   <input checked="" type="checkbox"/> No = <b>not an interdunal wetland for rating</b></p> <p>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)? <span style="float: right;"><input type="checkbox"/> Yes = <b>Category I</b>   <input type="checkbox"/> No – Go to <b>SC 6.2</b></span></p> <p>SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? <span style="float: right;"><input type="checkbox"/> Yes = <b>Category II</b>   <input type="checkbox"/> No – Go to <b>SC 6.3</b></span></p> <p>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? <span style="float: right;"><input type="checkbox"/> Yes = <b>Category III</b>   <input type="checkbox"/> No = <b>Category IV</b></span></p> |  |
| <p><b>Category of wetland based on Special Characteristics</b></p> <p>If you answered No for all types, enter "Not Applicable" on Summary Form</p>   |  |

Wetland name or number E

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Wetland name or number F

## RATING SUMMARY – Western Washington

Name of wetland (or ID #): F Date of site visit: 06/21/18  
 Rated by Richard Peel, Rachael Hyland Trained by Ecology?  Yes  No Date of training 6/29/16  
 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 Esri Arc GIS

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

### 1. Category of wetland based on FUNCTIONS

- Category I – Total score = 23 - 27  
~~X~~          Category II – Total score = 20 - 22  
         Category III – Total score = 16 - 19  
         Category IV – Total score = 9 - 15

| FUNCTION                              | Improving Water Quality | Hydrologic | Habitat |              |
|---------------------------------------|-------------------------|------------|---------|--------------|
| <i>Circle the appropriate ratings</i> |                         |            |         |              |
| Site Potential                        | H                       | M          | H       |              |
| Landscape Potential                   | M                       | M          | L       |              |
| Value                                 | H                       | M          | H       | <b>TOTAL</b> |
| <b>Score Based on Ratings</b>         | 8                       | 6          | 7       | 21           |

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

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

### 2. Category based on SPECIAL CHARACTERISTICS of wetland

| CHARACTERISTIC                     | CATEGORY          |
|------------------------------------|-------------------|
| 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                  | N/A               |

Wetland name or number F

## 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 ( <i>can be added to map of hydroperiods</i> )   | D 1.1, D 4.1         |          |
| Boundary of area within 150 ft of the wetland ( <i>can be added to another figure</i> )   | 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 ( <i>can be added to another figure</i> )   | R 2.4                |          |
| Plant cover of trees, shrubs, and herbaceous plants   | R 1.2, R 4.2         |          |
| Width of unit vs. width of stream ( <i>can be added to another figure</i> )   | 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 ( <i>can be added to another figure</i> )   | 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 <b>dense</b> trees, shrubs, and herbaceous plants  | S 1.3                |          |
| Plant cover of <b>dense, rigid</b> trees, shrubs, and herbaceous plants ( <i>can be added to figure above</i> )                   | S 4.1                |          |
| Boundary of 150 ft buffer ( <i>can be added to another figure</i> )   | 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 F

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

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 F

| <b>DEPRESSIONAL AND FLATS WETLANDS</b>   |  |   |
|--|--|---|
| <b>Water Quality Functions - Indicators that the site functions to improve water quality</b>   |  |   |
| <b>D 1.0. Does the site have the potential to improve water quality?</b>   |  |   |
| D 1.1. <u>Characteristics of surface water outflows from the wetland:</u><br>Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet).<br>Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet.<br>Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing<br>Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. | points = 3<br>points = 2<br>points = 1<br>points = 1 | 1                                       |
| D 1.2. <u>The soil 2 in below the surface (or duff layer) is true clay or true organic (use NRCS definitions).</u> Yes = 4 No = 0  |  | 4                                       |
| D 1.3. <u>Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes):</u><br>Wetland has persistent, ungrazed, plants > 95% of area<br>Wetland has persistent, ungrazed, plants > ½ of area<br>Wetland has persistent, ungrazed plants > 1/10 of area<br>Wetland has persistent, ungrazed plants < 1/10 of area   | points = 5<br>points = 3<br>points = 1<br>points = 0 | 3                                       |
| D 1.4. <u>Characteristics of seasonal ponding or inundation:</u><br><i>This is the area that is ponded for at least 2 months. See description in manual.</i><br>Area seasonally ponded is > ½ total area of wetland<br>Area seasonally ponded is > ¼ total area of wetland<br>Area seasonally ponded is < ¼ total area of wetland  | points = 4<br>points = 2<br>points = 0               | 4                                       |
| Total for D 1  |  | Add the points in the boxes above<br>12 |

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

|  |                |  |
|--|----------------|--|
| <b>D 2.0. Does the landscape have the potential to support the water quality function of the site?</b>                             |                |  |
| 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 | 1                                      |
| D 2.3. Are there septic systems within 250 ft of the wetland?  | Yes = 1 No = 0 | 0                                      |
| D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1-D 2.3?<br>Source _____ | Yes = 1 No = 0 | 0                                      |
| Total for D 2  |                | Add the points in the boxes above<br>1 |

**Rating of Landscape Potential** If score is:  3 or 4 = H  1 or 2 = M  0 = L Record the rating on the first page

|   |                |  |
|---|----------------|--|
| <b>D 3.0. Is the water quality improvement provided by the site valuable to society?</b>  |                |  |
| 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 | 0                                      |
| 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<br>3 |

**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 F

**DEPRESSIONAL AND FLATS WETLANDS**

**Hydrologic Functions** - Indicators that the site functions to reduce flooding and stream degradation

|   |  |          |
|---|--|----------|
| <b>D 4.0. Does the site have the potential to reduce flooding and erosion?</b>  |  |          |
| <b>D 4.1. Characteristics of surface water outflows from the wetland:</b>   |  |          |
| Wetland is a depression or flat depression with no surface water leaving it (no outlet)   | points = 4                               | 0        |
| 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                               |          |
| <b>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.</b> |  |          |
| Marks of ponding are 3 ft or more above the surface or bottom of outlet   | points = 7                               | 3        |
| 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                               |          |
| <b>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.</b>               |  |          |
| The area of the basin is less than 10 times the area of the unit  | points = 5                               | 3        |
| 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                               |          |
| <b>Total for D 4</b>  | <b>Add the points in the boxes above</b> | <b>6</b> |

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

|   |  |          |
|---|--|----------|
| <b>D 5.0. Does the landscape have the potential to support hydrologic functions of the site?</b>  |  |          |
| <b>D 5.1. Does the wetland receive stormwater discharges?</b>   | Yes = 1 No = 0                           | 0        |
| <b>D 5.2. Is &gt;10% of the area within 150 ft of the wetland in land uses that generate excess runoff?</b>   | Yes = 1 No = 0                           | 1        |
| <b>D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses (residential at &gt;1 residence/ac, urban, commercial, agriculture, etc.)?</b> | Yes = 1 No = 0                           | 1        |
| <b>Total for D 5</b>  | <b>Add the points in the boxes above</b> | <b>2</b> |

**Rating of Landscape Potential** If score is: 3 = H X 1 or 2 = M 0 = L Record the rating on the first page

|  |  |          |
|--|--|----------|
| <b>D 6.0. Are the hydrologic functions provided by the site valuable to society?</b>   |  |          |
| <b>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.</b> |  |          |
| 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):  |  | 1        |
| • 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                               |          |
| <b>D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan?</b>  | Yes = 2 No = 0                           | 0        |
| <b>Total for D 6</b>   | <b>Add the points in the boxes above</b> | <b>1</b> |

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

Wetland name or number F

**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

4

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**

2

H 1.3. Richness of plant species

Count the number of plant species in the wetland that cover at least 10 ft<sup>2</sup>.

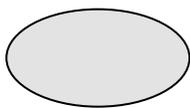
*Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle*

- If you counted: > 19 species points = 2
- 5 - 19 species points = 1
- < 5 species points = 0

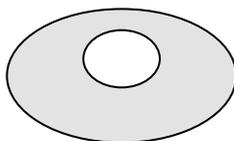
2

H 1.4. Interspersion of habitats

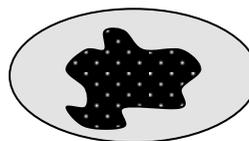
Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always high.*



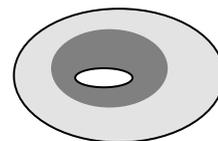
None = 0 points



Low = 1 point

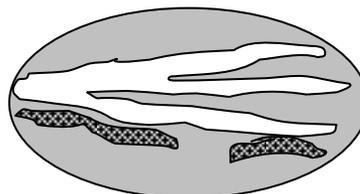
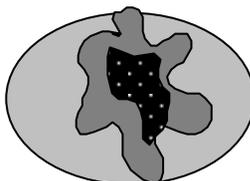
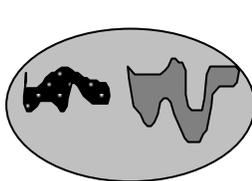


Moderate = 2 points



2

All three diagrams in this row are **HIGH** = 3points



Wetland name or number F

|   |   |
|---|---|
| <p>H 1.5. Special habitat features:<br/>         Check the habitat features that are present in the wetland. <i>The number of checks is the number of points.</i></p> <p><input checked="" type="checkbox"/> Large, downed, woody debris within the wetland (&gt; 4 in diameter and 6 ft long).</p> <p><input checked="" type="checkbox"/> Standing snags (dbh &gt; 4 in) within the wetland</p> <p><input checked="" type="checkbox"/> Undercut banks are present for at least 6.6 ft (2 m) <b>and/or</b> 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)</p> <p><input checked="" type="checkbox"/> Stable steep banks of fine material that might be used by beaver or muskrat for denning (&gt; 30 degree slope) OR signs of recent beaver activity are present (<i>cut shrubs or trees that have not yet weathered where wood is exposed</i>)</p> <p><input checked="" type="checkbox"/> At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (<i>structures for egg-laying by amphibians</i>)</p> <p><input type="checkbox"/> Invasive plants cover less than 25% of the wetland area in every stratum of plants (<i>see H 1.1 for list of strata</i>)</p> | 5   |
| <p>Total for H 1</p>  | <p style="text-align: right;">Add the points in the boxes above</p> <p style="text-align: center;">15</p> |

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

|   |   |
|---|---|
| <p>H 2.0. Does the landscape have the potential to support the habitat functions of the site?</p>   |   |
| <p>H 2.1. Accessible habitat (include <i>only habitat that directly abuts wetland unit</i>).</p> <p>Calculate: <input type="text" value="4.91"/> % undisturbed habitat + [(% moderate and low intensity land uses) <input type="text" value="0.57"/> /2] = <input type="text" value="5.195"/> %</p> <p>If total accessible habitat is:</p> <p>&gt; 1/3 (33.3%) of 1 km Polygon <span style="float: right;">points = 3</span></p> <p>20-33% of 1 km Polygon <span style="float: right;">points = 2</span></p> <p>10-19% of 1 km Polygon <span style="float: right;">points = 1</span></p> <p>&lt; 10% of 1 km Polygon <span style="float: right;">points = 0</span></p>        | 0   |
| <p>H 2.2. Undisturbed habitat in 1 km Polygon around the wetland.</p> <p>Calculate: <input type="text" value="7.39"/> % undisturbed habitat + [(% moderate and low intensity land uses) <input type="text" value="4.47"/> /2] = <input type="text" value="9.625"/> %</p> <p>Undisturbed habitat &gt; 50% of Polygon <span style="float: right;">points = 3</span></p> <p>Undisturbed habitat 10-50% and in 1-3 patches <span style="float: right;">points = 2</span></p> <p>Undisturbed habitat 10-50% and &gt; 3 patches <span style="float: right;">points = 1</span></p> <p>Undisturbed habitat &lt; 10% of 1 km Polygon <span style="float: right;">points = 0</span></p> | 0   |
| <p>H 2.3. Land use intensity in 1 km Polygon: If</p> <p>&gt; 50% of 1 km Polygon is high intensity land use <span style="float: right;">points = (- 2)</span></p> <p>≤ 50% of 1 km Polygon is high intensity <span style="float: right;">points = 0</span></p>  | -2  |
| <p>Total for H 2</p>  | <p style="text-align: right;">Add the points in the boxes above</p> <p style="text-align: center;">-2</p> |

**Rating of Landscape Potential** If score is:  4-6 = H  1-3 = M  < 1 = L *Record the rating on the first page*

|  |   |
|--|---|
| <p>H 3.0. Is the habitat provided by the site valuable to society?</p>   |   |
| <p>H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? <i>Choose only the highest score that applies to the wetland being rated.</i></p> <p>Site meets ANY of the following criteria: <span style="float: right;">points = 2</span></p> <p><input checked="" type="checkbox"/> It has 3 or more priority habitats within 100 m (see next page)</p> <p><input type="checkbox"/> It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists)</p> <p><input type="checkbox"/> It is mapped as a location for an individual WDFW priority species</p> <p><input type="checkbox"/> It is a Wetland of High Conservation Value as determined by the Department of Natural Resources</p> <p><input type="checkbox"/> 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</p> <p>Site has 1 or 2 priority habitats (listed on next page) within 100 m <span style="float: right;">points = 1</span></p> <p>Site does not meet any of the criteria above <span style="float: right;">points = 0</span></p> | 2 |

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

Wetland name or number F

## 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 multi-layered 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 F

**CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS**

| Wetland Type  | Category |
|---|----------|
| <i>Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.</i>   |          |
| <p><b>SC 1.0. Estuarine wetlands</b></p> <p>Does the wetland meet the following criteria for Estuarine wetlands?</p> <p><input type="checkbox"/> The dominant water regime is tidal,<br/> <input type="checkbox"/> Vegetated, and<br/> <input type="checkbox"/> With a salinity greater than 0.5 ppt</p> <p style="text-align: right;"><input type="checkbox"/> Yes –Go to <b>SC 1.1</b>   <input checked="" type="checkbox"/> No= <b>Not an estuarine wetland</b></p>  |          |
| <p>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?</p> <p style="text-align: right;"><input type="checkbox"/> Yes = <b>Category I</b>   <input type="checkbox"/> No - Go to <b>SC 1.2</b></p>  |          |
| <p>SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions?</p> <p><input type="checkbox"/> 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 <i>Spartina</i>, see page 25)</p> <p><input type="checkbox"/> At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or unmowed grassland.</p> <p><input type="checkbox"/> The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.</p> <p style="text-align: right;"><input type="checkbox"/> Yes = <b>Category I</b>   <input type="checkbox"/> No = <b>Category II</b></p>   |          |
| <p><b>SC 2.0. Wetlands of High Conservation Value (WHCV)</b></p> <p>SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value?</p> <p style="text-align: right;"><input type="checkbox"/> Yes – Go to <b>SC 2.2</b>   <input checked="" type="checkbox"/> No – Go to <b>SC 2.3</b></p> <p>SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value?</p> <p style="text-align: right;"><input type="checkbox"/> Yes = <b>Category I</b>   <input checked="" type="checkbox"/> No = <b>Not a WHCV</b></p> <p>SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland?<br/> <a href="http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf">http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf</a></p> <p style="text-align: right;"><input type="checkbox"/> Yes – <b>Contact WNHP/WDNR and go to SC 2.4</b>   <input checked="" type="checkbox"/> No = <b>Not a WHCV</b></p> <p>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?</p> <p style="text-align: right;"><input type="checkbox"/> Yes = <b>Category I</b>   <input checked="" type="checkbox"/> No = <b>Not a WHCV</b></p>  |          |
| <p><b>SC 3.0. Bogs</b></p> <p>Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? <i>Use the key below. If you answer YES you will still need to rate the wetland based on its functions.</i></p> <p>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?</p> <p style="text-align: right;"><input type="checkbox"/> Yes – Go to <b>SC 3.3</b>   <input checked="" type="checkbox"/> No – Go to <b>SC 3.2</b></p> <p>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?</p> <p style="text-align: right;"><input type="checkbox"/> Yes – Go to <b>SC 3.3</b>   <input checked="" type="checkbox"/> No = <b>Is not a bog</b></p> <p>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?</p> <p style="text-align: right;"><input type="checkbox"/> Yes = <b>Is a Category I bog</b>   <input type="checkbox"/> No – Go to <b>SC 3.4</b></p> <p><b>NOTE:</b> 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.</p> <p>SC 3.4. Is an area with peats or mucks forested (&gt; 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?</p> <p style="text-align: right;"><input type="checkbox"/> Yes = <b>Is a Category I bog</b>   <input type="checkbox"/> No = <b>Is not a bog</b></p> |          |

Wetland name or number F

|  |  |
|--|--|
| <p><b>SC 4.0. Forested Wetlands</b></p> <p>Does the wetland have at least <u>1 contiguous acre</u> of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? <b><i>If you answer YES you will still need to rate the wetland based on its functions.</i></b></p> <ul style="list-style-type: none"> <li>— <b>Old-growth forests</b> (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.</li> <li>— <b>Mature forests</b> (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).</li> </ul> <p style="text-align: right;"><input type="checkbox"/> Yes = <b>Category I</b>   <input checked="" type="checkbox"/> No = <b>Not a forested wetland for this section</b></p>   |  |
| <p><b>SC 5.0. Wetlands in Coastal Lagoons</b></p> <p>Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?</p> <ul style="list-style-type: none"> <li>— 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</li> <li>— The lagoon in which the wetland is located contains ponded water that is saline or brackish (&gt; 0.5 ppt) during most of the year in at least a portion of the lagoon (<i>needs to be measured near the bottom</i>)</li> </ul> <p style="text-align: right;"><input type="checkbox"/> Yes – Go to <b>SC 5.1</b>   <input checked="" type="checkbox"/> No = <b>Not a wetland in a coastal lagoon</b></p> <p>SC 5.1. Does the wetland meet all of the following three conditions?</p> <ul style="list-style-type: none"> <li>— 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).</li> <li>— At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or unmowed grassland.</li> <li>— The wetland is larger than 1/10 ac (4350 ft<sup>2</sup>)</li> </ul> <p style="text-align: right;"><input type="checkbox"/> Yes = <b>Category I</b>   <input type="checkbox"/> No = <b>Category II</b></p>   |  |
| <p><b>SC 6.0. Interdunal Wetlands</b></p> <p>Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? <b><i>If you answer yes you will still need to rate the wetland based on its habitat functions.</i></b></p> <p>In practical terms that means the following geographic areas:</p> <ul style="list-style-type: none"> <li>— Long Beach Peninsula: Lands west of SR 103</li> <li>— Grayland-Westport: Lands west of SR 105</li> <li>— Ocean Shores-Copalis: Lands west of SR 115 and SR 109</li> </ul> <p style="text-align: right;"><input type="checkbox"/> Yes – Go to <b>SC 6.1</b>   <input checked="" type="checkbox"/> No = <b>not an interdunal wetland for rating</b></p> <p>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)? <span style="float: right;"><input type="checkbox"/> Yes = <b>Category I</b>   <input type="checkbox"/> No – Go to <b>SC 6.2</b></span></p> <p>SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? <span style="float: right;"><input type="checkbox"/> Yes = <b>Category II</b>   <input type="checkbox"/> No – Go to <b>SC 6.3</b></span></p> <p>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? <span style="float: right;"><input type="checkbox"/> Yes = <b>Category III</b>   <input type="checkbox"/> No = <b>Category IV</b></span></p> |  |
| <p><b>Category of wetland based on Special Characteristics</b></p> <p>If you answered No for all types, enter "Not Applicable" on Summary Form</p>   |  |

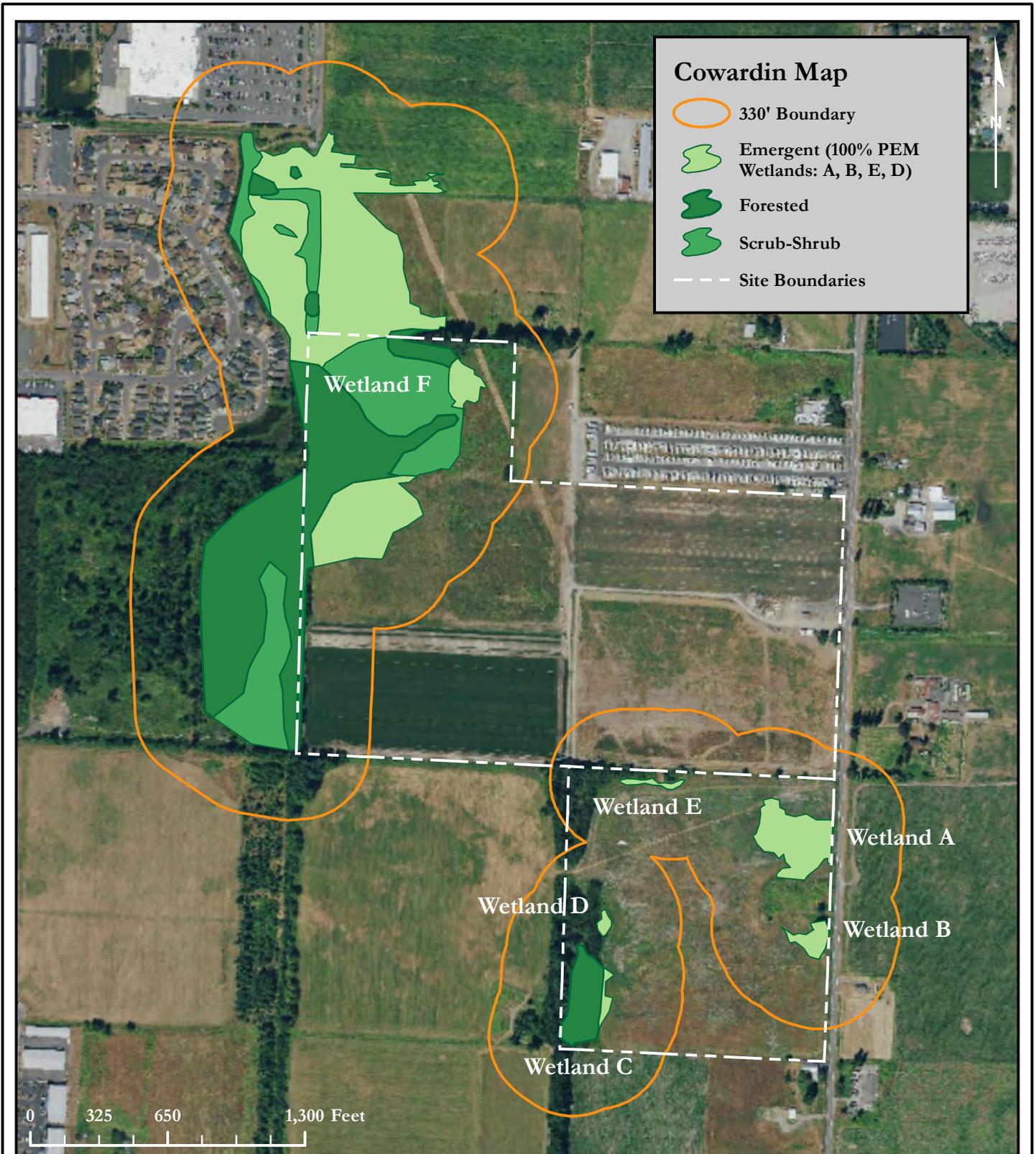
Wetland name or number F

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# Appendix G — Wetland Rating Maps

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# SCHOULTES PROPERTY - WETLAND RATING MAP



**Cowardin Map**

-  330' Boundary
-  Emergent (100% PEM Wetlands: A, B, E, D)
-  Forested
-  Scrub-Shrub
-  Site Boundaries

0 325 650 1,300 Feet



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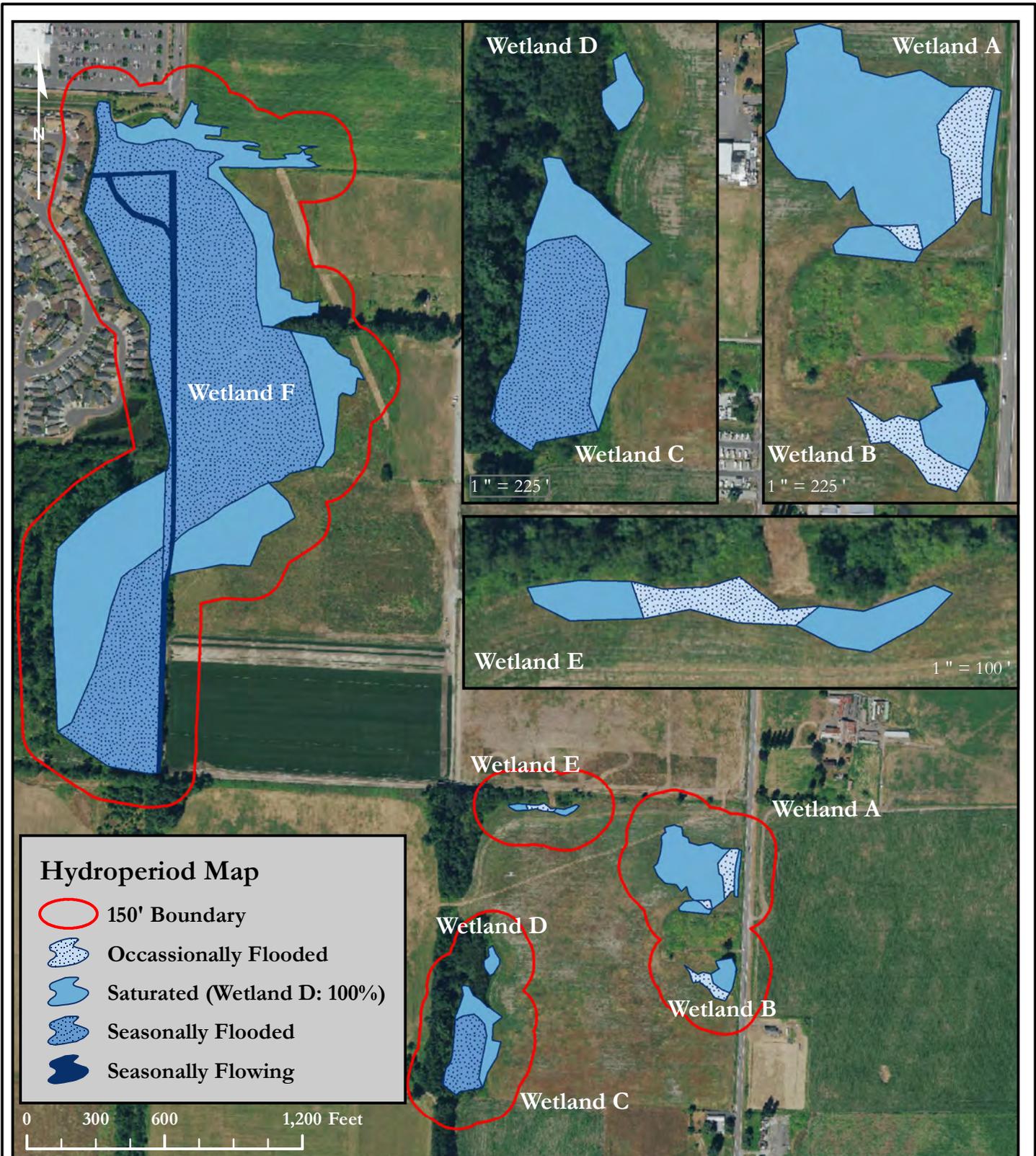
**SCHOULTES PROPERTY**

15808 & 16204 51ST AVENUE NE  
 MARYSVILLE, WA 98271-7506

SNOHOMISH COUNTY PARCEL NUMBERS:  
 31052800400100 & 31052800400400

|                   |
|-------------------|
| DATE: 1/6/2021    |
| JOB: 1778.0003    |
| BY: DLS           |
| SCALE: 1" = 650'  |
| FIGURE NO. 1 of 5 |

# SCHOULTES PROPERTY - WETLAND RATING MAP



**Hydroperiod Map**

- 150' Boundary
- Occasionally Flooded
- Saturated (Wetland D: 100%)
- Seasonally Flooded
- Seasonally Flowing




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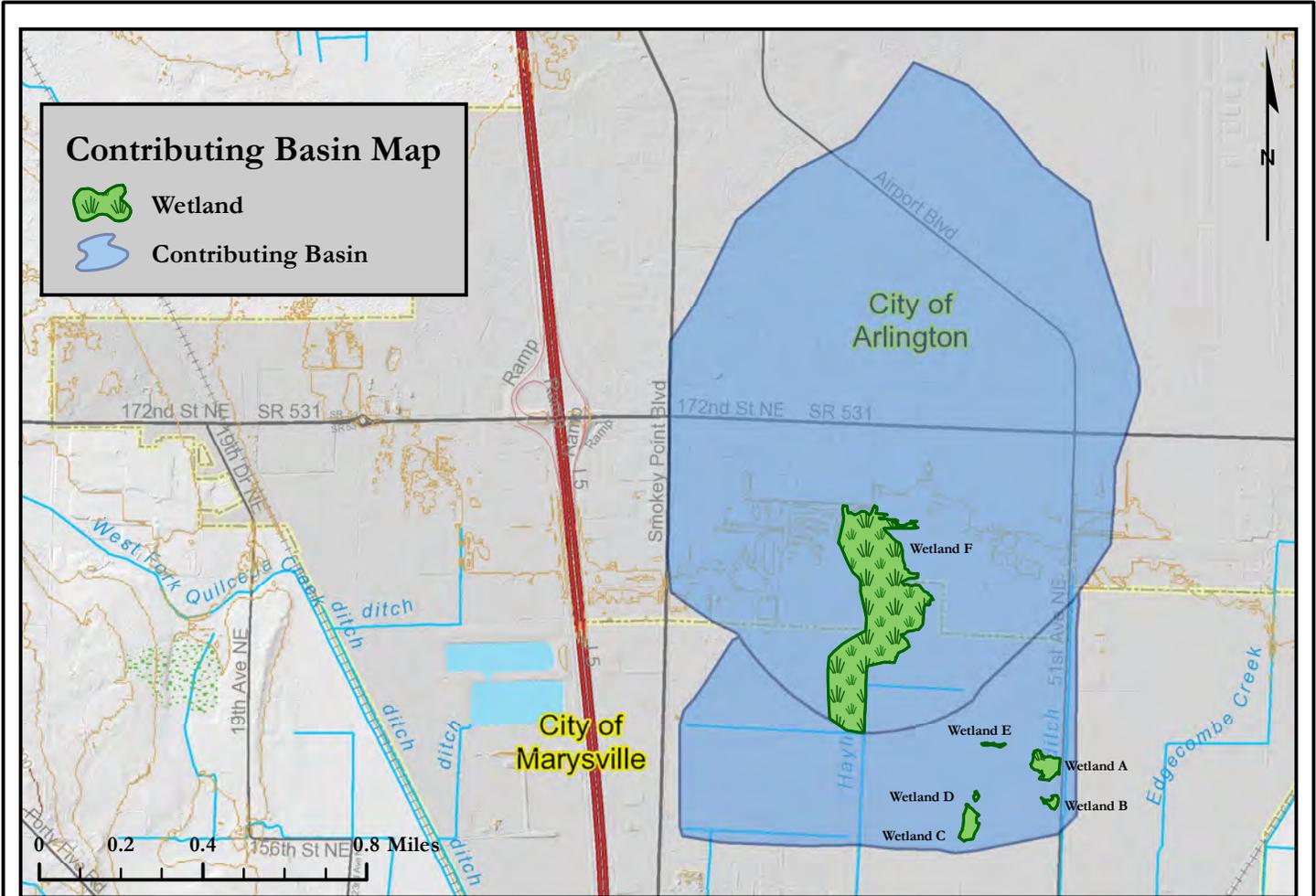
**SCHOULTES PROPERTY**

15808 & 16204 51ST AVENUE NE  
 MARYSVILLE, WA 98271-7506

SNOHOMISH COUNTY PARCEL NUMBERS:  
 31052800400100 & 31052800400400

|                   |
|-------------------|
| DATE: 1/8/2021    |
| JOB: 1655.0001    |
| BY: DLS           |
| SCALE: 1" = 600'  |
| FIGURE NO. 2 of 5 |

# SCHOULTES PROPERTY - WETLAND RATING MAP



| D.4.0 |   |               |
|-------|---|---------------|
| D.4.3 |   |               |
|       | Area of Contributing Basin (SF)   | 47,851,660    |
|       | Area of Wetland A (SF)  | 88,506        |
|       | <b>Percent of Wetland A within Contributing Basin</b>                                 | <b>0.185%</b> |
|       | Area of Wetland B (SF)  | 19,195        |
|       | <b>Percent of Wetland B within Contributing Basin</b>                                 | <b>0.040%</b> |
|       | Area of Wetland C (SF)  | 59,974        |
|       | <b>Percent of Wetland C within Contributing Basin</b>                                 | <b>0.125%</b> |
|       | Area of Wetland D (SF)  | 5,281         |
|       | <b>Percent of Wetland D within Contributing Basin</b>                                 | <b>0.011%</b> |
|       | Area of Wetland E (SF)  | 7,049         |
|       | <b>Percent of Wetland E within Contributing Basin</b>                                 | <b>0.015%</b> |
|       | Area of Intensive Human Land Uses (SF)  | 40,354,658    |
|       | <b>Percent of Intensive Human Land Use within Contributing Basin for Wetlands A-E</b> | <b>84%</b>    |
|       | Area of Contributing Basin (SF)   | 37,556,734    |
|       | Area of Wetland F (SF)  | 1,854,407     |
|       | <b>Percent of Wetland F within Contributing Basin</b>                                 | <b>3.875%</b> |
|       | Area of Intensive Human Land Uses (SF)  | 31,037,258    |
|       | <b>Percent of Intensive Human Land Use within Contributing Basin for Wetland A-F</b>  | <b>83%</b>    |



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SNOHOMISH COUNTY PARCEL NUMBERS:  
 31052800400100 & 31052800400400

DATE: 1/6/2021

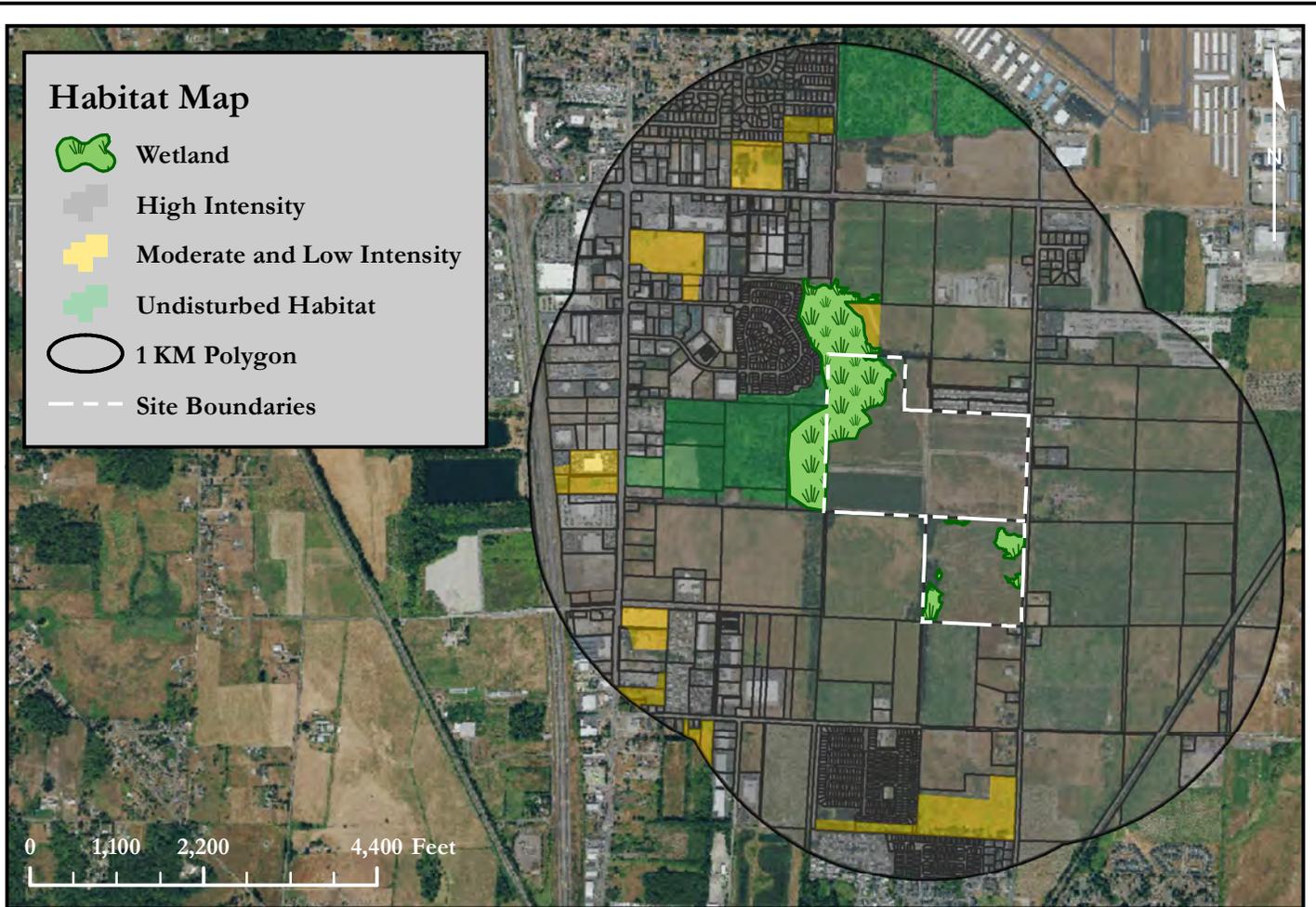
JOB: 1778.0003

BY: DLS

SCALE: SEE GRAPHIC

FIGURE NO. **3** of 5

# SCHOULTES PROPERTY - WETLAND RATING MAP



|                    |  |               |
|--------------------|--|---------------|
| H.2.0 Wetlands A-F |  |               |
| H.2.1              |  |               |
|                    | Abutting Undisturbed Habitat                   | 4.91%         |
|                    | Abutting Moderate & Low Intensity Land Uses    | 0.57%         |
|                    | <b>Accessible Habitat</b>                      | <b>5.19%</b>  |
| H.2.2              |  |               |
|                    | Undisturbed Habitat                            | 7.39%         |
|                    | Moderate & Low Intensity Land Uses             | 4.47%         |
|                    | <b>Undisturbed Habitat in 1 KM Polygon</b>     | <b>9.62%</b>  |
| H.2.3              |  |               |
|                    | <b>High Intensity Land Use in 1 KM Polygon</b> | <b>88.14%</b> |



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**SCHOULTES PROPERTY**

15808 & 16204 51ST AVENUE NE  
 MARYSVILLE, WA 98271-7506

SNOHOMISH COUNTY PARCEL NUMBERS:  
 31052800400100 & 31052800400400

DATE: 1/6/2021

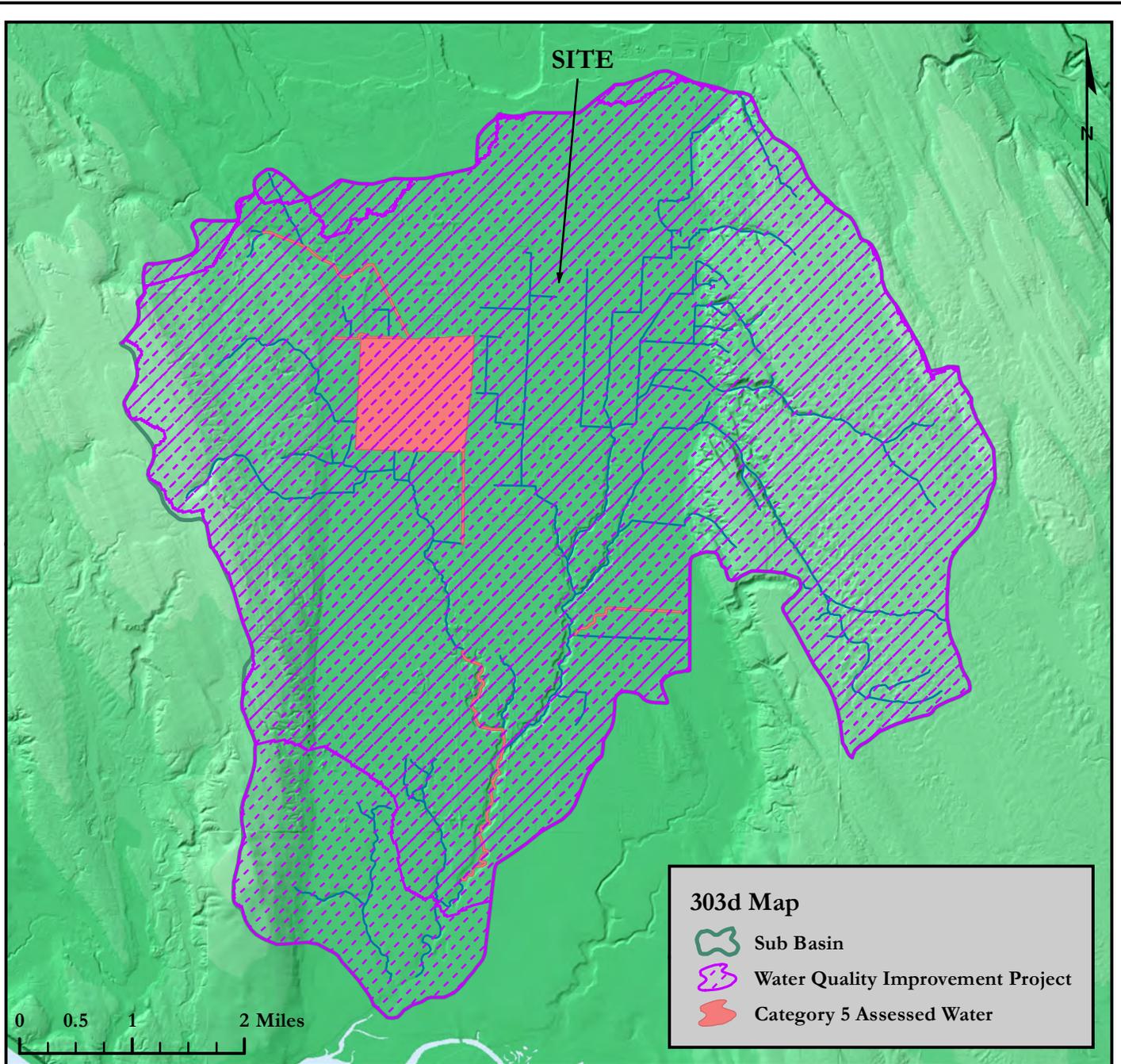
JOB: 1778.0003

BY: DLS

SCALE: 1" = 2,250'

FIGURE NO. 4 of 5

# SCHOULTES PROPERTY - WETLAND RATING MAP



| Name  | Pollutants                                       | TMDL_ID | WRIA | YrApproved |
|---|--|---------|------|------------|
| Snohomish River Tributaries Bacteria TMDL         | Bacteria   | 34      | 07   | 2001       |
| Stillaguamish River Watershed Temperature TMDL    | Temperature                                      | 73      | 05   | 2006       |
| Snohomish River Estuary Multiparameter TMDL       | Ammonia-N, CBOD, Dissolved Oxygen                | 48      | 07   | 2002       |
| Stillaguamish River Watershed Multiparameter TMDL | Bacteria, Dissolved Oxygen, pH, Mercury, Arsenic | 75      | 05   | 2006       |



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**SCHOULTES PROPERTY**

15808 & 16204 51ST AVENUE NE  
 MARYSVILLE, WA 98271-7506

SNOHOMISH COUNTY PARCEL NUMBERS:  
 31052800400100 & 31052800400400

DATE: 1/6/2021

JOB: 1778.0003

BY: DLS

SCALE: 1" = 1 mi

FIGURE NO. 5 of 5

## Appendix H — Monitoring Well Photos

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Monitoring Well MP-3 (Wetland A)



Monitoring Well MP-4 (Wetland A)



**Monitoring Well MP-5 (Upland to Wetland A)**



**Monitoring Well MP-7 (Wetland B)**



**Monitoring Well MP-6 (Upland to Wetland B)**



**Monitoring Point MP-38 (Wetland C)**



**Monitoring Well MP-12 (Upland to Wetland C)**



**Monitoring Point MP-16 (Upland to Wetland E)**



Monitoring Well MP-30 (Wetland F)



Monitoring Well MP-33 (Wetland F)



**Monitoring Well MP-29 (Upland to Wetland F)**



**Monitoring Well MP-31 (Upland to Wetland F)**



**Monitoring Well MP-32 (Upland to Wetland F)**



**Monitoring Point MP-35 (Wetland F)**



## Appendix I — Monitoring Well and Precipitation Summary

|                 | Date   | Date    | Date    | Date   | Date   | Date    | Date   | Date    | Date    | Date    | Date     | Date   | Date   | Date  |
|-----------------|--------|---------|---------|--------|--------|---------|--------|---------|---------|---------|----------|--------|--------|-------|
|                 | 6-Mar  | 14-Mar  | 20-Mar  | 27-Mar | 3-Apr  | 10-Apr  | 17-Apr | 25-Apr  | 2-May   | 8-May   | 15-May   | 22-May | 29-May | 5-Jun |
| Precipitation   | 0.34   | 0.69    | 0       | 1.41   | 0      | 1.94    | 3.4    | 0.03    | 0.32    | 0.04    | 0.04     | 0.04   | 0      | 0.01  |
| Monitoring Plot |        |         |         |        |        |         |        |         |         |         |          |        |        |       |
| 1               | -12    | -14.75  | -38     | -2.875 | -15.38 | -5.375  | -2     | -19.375 | -19.75  | -38     | -38      | -38    | -38    | -38   |
| 2               | -11.63 | -14.5   | -38     | -2.375 | -14.25 | -4.5    | -1.625 | -20.375 | -20.75  | -38     | -38      | -38    | -38    | -38   |
| 3               | -6.125 | -8.875  | -16.125 | 1.25   | -10.38 | -0.5    | 0.875  | -16.25  | -16.5   | -22.5   | -38      | -38    | -38    | -38   |
| 4               | -3.375 | -7.375  | -20.125 | -0.625 | -7.375 | -0.875  | -1.375 | -17.875 | -15.375 | -22.375 | -21.4219 | -38    | -38    | -38   |
| 5               | -7.625 | -11.75  | -19.875 | 0.25   | -12.13 | -0.5    | 1.875  | -18.125 | -18.375 | -38     | -38      | -38    | -38    | -38   |
| 6               | -11.63 | -16     | -22.875 | -0.5   | -15.25 | -3.125  | -1     | -21.125 | -23.125 | -27.125 | -38      | -38    | -38    | -38   |
| 7               | -7.375 | -12.125 | -18.75  | 0.125  | -11.38 | -1      | 1.25   | -17.5   | -18.625 | -23.75  | -38      | -38    | -38    | -38   |
| 8               | -14.5  | -18.75  | -38     | -1.375 | -17.63 | -4.75   | -1.875 | -38     | -38     | -38     | -23.7857 | -38    | -38    | -38   |
| 9               | -11.13 | -14.625 | -23.5   | -0.875 | -14.25 | -3.5    | 0.375  | -19.75  | -21.75  | -38     | -38      | -38    | -38    | -38   |
| 10              | -7.5   | -11.75  | -20.625 | 0      | -12.25 | -0.25   | 0.125  | -18.125 | -20.625 | -23.25  | -38      | -38    | -38    | -38   |
| 11              | -11.13 | -15.25  | -38     | -1.375 | -15    | -3      | -1.625 | -22.25  | -38     | -38     | -38      | -38    | -38    | -38   |
| 12              | -7.125 | -11.75  | -21.375 | -1     | -10.5  | -1      | -1     | -17.125 | -20.375 | -38     | -38      | -38    | -38    | -38   |
| 13              | -18.63 | -21.75  | -38     | -2.25  | -22.13 | -7.125  | -3.375 | -38     | -38     | -38     | -38      | -38    | -38    | -38   |
| 14              | -11.13 | -16.125 | -38     | -0.25  | -15.5  | -2.125  | 0.625  | -20.375 | -23     | -38     | -38      | -38    | -38    | -38   |
| 15              | -11.25 | -15.25  | -23.125 | -1     | -16.63 | -4.125  | -1     | -21.375 | -21.75  | -38     | -38      | -38    | -38    | -38   |
| 16              | -15.13 | -18.75  | -38     | -3     | -19.25 | -6.625  | -3.375 | -24     | -38     | -38     | -38      | -38    | -38    | -38   |
| 17              | -12.75 | -16.25  | -23.75  | -1.25  | -17.5  | -6.75   | -0.25  | -21.5   | -22.75  | -38     | -38      | -38    | -38    | -38   |
| 18              | -13.25 | -16.5   | -38     | -3.625 | -17.63 | -5.875  | -0.625 | -23.5   | -23.5   | -25.75  | -38      | -38    | -38    | -38   |
| 19              | -19.5  | -23.75  | -38     | -8.75  | -26    | -11.875 | -5.125 | -38     | -38     | -38     | -38      | -38    | -38    | -38   |
| 20              | -16.75 | -19.5   | -38     | -6.25  | -16.88 | -10     | -2.5   | -20.125 | -38     | -38     | -38      | -38    | -38    | -38   |
| 21              | -12.25 | -14.75  | -21.125 | -6.5   | -16    | -8      | -2.625 | -19.25  | -19.625 | -23.875 | -38      | -38    | -38    | -38   |
| 22              | -17.13 | -18.25  | -23.375 | -8.75  | -18.88 | -10.875 | -6.375 | -22.125 | -22.625 | -38     | -38      | -38    | -38    | -38   |
| 23              | -23.63 | -23.5   | -27.75  | -14.25 | -24.13 | -16.875 | -13.25 | -26.125 | -26.875 | -38     | -38      | -38    | -38    | -38   |

|    |        |         |         |        |        |         |        |         |         |         |          |          |          |         |
|----|--------|---------|---------|--------|--------|---------|--------|---------|---------|---------|----------|----------|----------|---------|
| 24 | -13.38 | -14     | -17.125 | -5.25  | -14.63 | -7.125  | -3.75  | -17     | -16.625 | -19.875 | -20.875  | -22.375  | -25.125  | -24.625 |
| 25 | -15.38 | -16     | -23.875 | -3     | -19    | -10.375 | -2.375 | -20.875 | -21.5   | -24.25  | -27.0938 | -27.7188 | -29.5938 | -38     |
| 26 | -22.38 | -23     | -38     | -13    | -25.63 | -14.875 | -9.375 | -25.5   | -24.625 | -38     | -38      | -38      | -38      | -38     |
| 27 | -13    | -13.125 | -17.125 | -3.125 | -14.75 | -3.75   | 0.875  | -15.375 | -15.375 | -18.125 | -21.2813 | -22.9063 | -24.7813 | 24.7813 |
| 28 | -12.5  | -13     | -16.125 | -4.5   | -16.38 | -4.375  | -1.875 | -15.125 | -16.5   | -19.625 | -21.1563 | -22.7813 | -24.7813 | 30.7813 |
| 29 | -12.63 | -10.75  | -14.875 | -2     | -12.75 | -1.875  | -0.5   | -11.375 | -13.12  | -17.25  | -20.2031 | -22.0781 | -23.2031 | 19.4531 |
| 30 | -3.625 | -1.5    | -3.875  | -0.125 | -2.875 | -1.875  | -0.375 | -2.5    | -3.125  | -6.375  | -13.0313 | -21.6563 | -25.9063 | 24.9063 |
| 31 | -12.88 | -13.25  | -16.875 | -3.625 | -14.13 | -5.25   | -3.25  | -14.75  | -14.375 | -19.875 | -21.1406 | -23.0156 | -26.3906 | 25.3906 |
| 32 | -17.25 | -16.75  | -22.375 | -5.875 | -18.75 | -9.75   | -4.5   | -19.5   | -20.75  | -24.625 | -38      | -38      | -38      | -38     |
| 33 | -6.5   | -6.75   | -10     | -0.625 | -8.5   | -3.25   | -0.875 | -9      | -11     | -13.625 | -15.3125 | -16.8125 | -19.4375 | 19.4375 |
| 34 | -18    | -18.25  | -24.375 | -8     | -19.25 | -9.25   | -4.875 | -20.75  | -23.125 | -24.75  | -38      | -38      | -38      | -38     |
| 35 | 2      | 7.25    | 4.625   | 8.875  | 4      | 6.5     | 7.875  | 5.625   | 4       | -3.5    | 4.75     | 4.25     | 3.25     | 3       |
| 36 | 5      | 6       | 6       | 9      | 7      | 8.625   | 9.125  | 7.125   | 6.375   | 5       | 6        | 4.75     | 2.5      | 3       |
| 37 | -13.63 | -16.875 | -23.875 | -1.625 | -16.5  | -3.5    | -0.875 | -22.875 | -23     | -31     | -38      | -38      | -38      | -38     |
| 38 | 2      | 10      | -8      | 1      | 9      | 1       | 1.375  | -18     | -18     | -38     | -38      | -38      | -38      | -38     |
| 39 | N/A    | N/A     | -27.875 | -6.75  | -20.38 | -10.25  | -2.625 | -23.875 | -25.5   | -29.375 | -38      | -38      | -38      | -38     |
| 40 | N/A    | N/A     | -38     | -11.5  | -24    | -13     | -6.625 | -27.5   | -28.5   | -29.625 | -38      | -38      | -38      | -38     |
| 41 | N/A    | N/A     | -38     | -14.75 | -27.13 | -16     | -7.25  | -38     | -38     | -27.125 | -38      | -38      | -38      | -38     |
| 42 | N/A    | N/A     | -16.25  | -4.25  | -14    | -3.375  | -2.625 | -12.75  | -14.75  | -16.125 | -17.8542 | -18.9792 | -19.9792 | 19.7292 |

Notes:

1. Precipitation volume in inches. Data obtained from the NOAA (<http://w2.weather.gov/climate/xmacis.php?wfo=sew>) for Seattle-Tacoma International airport.
2. Blue highlights data where water table elevations at or above 12 inches were observed for at least 14 continuous days during the monitoring period.
3. Yellow highlights data where water table elevations were below the -38-inch extent of the monitoring well. The actual water table elevation is not known in these instances.

## Appendix J — Qualifications

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All field inspections, jurisdictional wetland boundary delineations, habitat assessments, and supporting documentation, including this ***Wetland Delineation and Fish and Wildlife Habitat Assessment Report*** prepared for the ***Rex Development*** project site were prepared by, or under the direction of, Jon Pickett of SVC.

### Jon Pickett

Associate Principal

Professional Experience: 10+ years

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Jon Pickett is an Associate Principal and Senior Scientist with a diverse background in environmental and shoreline compliance and permitting, wetland and stream ecology, fish and wildlife biology, mitigation compliance and design, and environmental planning and land use due diligence. Jon oversees a wide range of large-scale industrial, commercial, and multi-family residential projects throughout Western Washington, providing environmental permitting and regulatory compliance assistance for land use entitlement projects from feasibility through mitigation compliance. Jon performs wetland, stream, and shoreline delineations and fish & wildlife habitat assessments; conducts code and regulation analysis and review; prepares reports and permit applications and documents; provides environmental compliance recommendation; and provides restoration and mitigation design.

Jon earned a Bachelor of Science degree in Natural Resource Sciences from Washington State University and Bachelor of Science and Minor in Forestry from Washington State University. Jon has received 40-hour wetland delineation training (Western Mountains, Valleys, & Coast and Arid West Regional Supplements) and regularly performs wetland, stream, and shoreline delineations. Jon is a Whatcom County Qualified Wetland Specialist and Wildlife Biologist and is a Pierce County Qualified Wetland Specialist. He has been formally trained by WSDOE in the use of the Washington State Wetland Rating System 2014, How to Determine the Ordinary High-Water Mark (Freshwater and Marine), Using Field Indicators for Hydric Soils, and the Using the Credit-Debit Method for Estimating Mitigation Needs.

### Kyla Caddey, PWS, Certified Ecologist

Senior Environmental Scientist

Professional Experience: 7 years

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Kyla Caddey is a Senior Environmental Scientist with a diverse background in stream and wetland ecology, wildlife ecology and conservation, wildlife and natural resource assessments and monitoring, and riparian habitat restoration at various public and private entities. Kyla has field experience performing in-depth studies in both the Pacific Northwest and Central American ecosystems which included various environmental science research and statistical analysis. Kyla has advanced expertise in federal- and state-listed endangered, threatened, and sensitive species surveys and assessment of aquatic and terrestrial systems throughout the Puget Sound region. She has completed hundreds of wetland delineations and has extensive knowledge and interest in hydric soil identification. As the senior writer, she provides informed project oversight and performs final quality assurance / quality control on various types of scientific reports for agency submittal, including: Biological Assessments/Evaluations; Wetland, Shoreline, and Fish and Wildlife Habitat Assessments; Mitigation Plans, and Mitigation Monitoring Reports. She currently performs wetland, stream, and shoreline

delineations and fish and wildlife habitat assessments; prepares scientific reports; and provides environmental permitting and regulatory compliance assistance to support a wide range of commercial, industrial, and multi-family residential land use projects.

Kyla earned a Bachelor of Science degree in Environmental Science and Resource Management from the University of Washington, Seattle with a focus in Wildlife Conservation and a minor in Quantitative Science. She has also completed additional coursework in Comprehensive Bird Biology from Cornell University. Ms. Caddey is a Certified Professional Wetland Scientist (PWS #3479) through the Society of Wetland Scientists and Certified Ecologist through the Ecological Society of America. She has received 40-hour wetland delineation training (Western Mtns, Valleys, & Coast and Arid West Regional Supplement), is a Pierce County Qualified Wetland Specialist and Wildlife Biologist, and is a USFWS-approved Mazama pocket gopher survey biologist. Kyla has been formally trained through the Washington State Department of Ecology, Coastal Training Program, and the Washington Native Plant Society in winter twig and grass, sedge, and rush identification for Western WA; Using the Credit-Debit Method in Estimating Wetland Mitigation Needs; How to Determine the Ordinary High Water Mark; Using Field Indicators for Hydric Soils; How to Administer Development Permits in Washington Shorelines; Puget Sound Coastal Processes; and Forage Fish Survey Techniques. Additionally, she has received formal training in preparing WSDOT Biological Assessments.

### **Laura Livingston**

Senior Environmental Planner

Professional Experience: 8 years

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Laura Livingston is an Environmental Planner with a background in water quality monitoring, invasive species monitoring, wildlife monitoring, wilderness stewardship, and erosion control projects. Laura has field experience working on natural resources projects, with an emphasis on stream and river projects, in the Northwest, Northeast, and Southwest United States. She has also worked on a variety of environmental science research, grant, and teaching projects requiring scientific writing, science communication, laboratory work, and statistical analysis. She currently performs ordinary high water delineations; conducts environmental code analysis; and prepares environmental assessment and mitigation reports, biological evaluations, and permit applications to support clients through the regulatory and planning process. Laura has a particular interest in shoreline projects and has prepared a variety of application materials to support projects within Shoreline Master Program jurisdictions.

Laura earned a Master of Science degree in Environmental Science from Washington State University, Pullman. She has received training from the Washington State Department of Ecology in How to Administer Shoreline Development Permits in Western Washington's Shorelines, Determining the Ordinary High Water Mark, the revised Washington State Wetland Rating System, Puget Sound Coastal Processes, How to Conduct a Forage Fish Survey, and Using the Credit-Debit Method for Estimating Mitigation Needs. Laura has also received training from the Washington State Department of Transportation in Biological Assessment Preparation for Transportation Projects and is listed by WSDOT as a junior author for preparing Biological Assessments. Laura is interested in stormwater management and has received a certificate in Low Impact Development Design from the Washington Stormwater Center.

### **Rachael Hyland, PWS, Certified Ecologist**

Senior Environmental Scientist

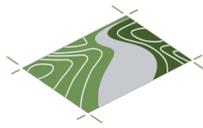
Professional Experience: 9 years

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Rachael Hyland is a Senior Environmental Scientist with extensive wetland and stream delineation and regulatory coordination experience. Rachael has a background in wetland and ecological habitat assessments in various states, most notably Washington, Connecticut, Massachusetts, Rhode Island, and Ohio. She has experience in assessing wetland, stream, riparian, and tidal systems, as well as complicated agricultural and disturbed sites. She currently performs wetland, stream, and shoreline delineations and fish and wildlife habitat assessments; conducts environmental code analysis; and prepares environmental assessment and mitigation reports, biological evaluations, and permit applications to support clients through the regulatory and planning process for various land use projects. She also has extensive knowledge of bats and their associated habitats and white nose syndrome (*Pseudogymnoascus destructans*), a fungal disease affecting bats which was recently documented in Washington.

Rachael earned a Bachelor of Science degree in Ecology and Evolutionary Biology from the University of Connecticut, with additional ecology studies at the graduate level. Rachael is a Professional Wetland Scientist (PWS #3480) through the Society of Wetland Scientists as well as a Certified Ecologist through the Ecological Society of America. She has completed 40-hour wetland delineation training for Western Mountains, Valleys, & Coast and Arid West Regional Supplement, in addition to formal training for the Northcentral and Northeast supplement, and experience with the Midwest, Eastern Mountains and Piedmont, and Atlantic and Gulf Coast supplements. She has also received formal training from the Washington State Department of Ecology in the Using the Revised 2014 Wetland Rating System for Western Washington, How to Determine the Ordinary High Water Mark, Navigating SEPA, Selecting Wetland Mitigation Sites Using a Watershed Approach, and Wetland Classification. Rachael has also received training from the Washington State Department of Transportation in Biological Assessment Preparation for Transportation Projects and is listed by WSDOT as a junior author for preparing Biological Assessments.





## Soundview Consultants LLC

Environmental Assessment • Planning • Land Use Solutions

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Phone: (253) 514-8952 Fax: (253) 514-8954

# Technical Memorandum

**To:** Ryan Kilby, Williams Investments **File Number:** 1778.0003

**From:** Jon Pickett, Soundview Consultants LLC **Date:** September 6, 2023  
Shauna Willett, Soundview Consultants LLC

**Re:** Arborist Report and Tree Retention Plan  
51<sup>st</sup> Ave NE - 16430 51st Avenue Northeast, Arlington, Washington 98223

Dear Mr. Kilby,

Soundview Consultants LLC (SVC) is assisting Williams Investments (Applicant) with an Arborist Report and Tree Retention Plan for the proposed industrial development of a 19.37-acre site located at 16430 51st Avenue Northeast, in the City of Arlington, Washington. The subject property consists of one parcel situated in the Northeast  $\frac{1}{4}$  of Section 28, Township 31 North, Range 05, W.M (Snohomish County Tax Parcel Numbers 31052800100700). SVC investigated the site to identify and assess trees within critical areas according to the standards of Arlington Municipal Code (AMC) 20.76 (Screening and Trees).

### Purpose

The purpose of this Arborist Report and Tree Retention Plan is to evaluate the proposed project according to the tree retention standards of AMC 20.76. A tree assessment was conducted to survey a forested strip along the property boundary of the 19.37-acre site. An analysis of trees within this strip or windrow was made to identify trees to be retained and removed bordering the proposed development and associated infrastructure. It should be noted that the trees surveyed for this report exist on both Arlington and Marysville jurisdictions, however, for the purposes of this report, only the Arlington Municipal Code will be applied as it is the more restrictive of the two and provides more encompassing and detailed code requirements. Therefore, if the Arlington code requirements are met, then Marysville code requirements are also met.

### Proposed Project

The Applicant proposes industrial development of the subject property and neighboring parcels (Snohomish County Tax Parcel Numbers 31052800400100 and 31052800400400) to include four warehouses, car and truck parking, new public access roads and internal site access, and associated infrastructure including stormwater management and utilities. The proposed project has been carefully designed to avoid and minimize impacts to the identified critical areas to the greatest extent feasible by utilizing all upland areas onsite and avoiding direct impacts to Hayho Creek and Wetland F, the highest functioning critical areas onsite. Minimization measures include locating stormwater infrastructure belowground to maximize developable uplands onsite and reorienting the warehouse adjacent to Wetland F and Hayho Creek in an east-west alignment which positions the high activity areas associated with truck courts and loading docks away from the critical areas. However, complete

avoidance of aquatic features is not possible due to the scattered distribution of wetlands and ditches throughout the subject property, the large spatial footprints required for industrial buildings and associated utilities, the required alignment for the new public roadways, and the presence of a natural gas line through the site which inhibits building construction. In order to accommodate the purpose and need for the industrial site development, the project requires the necessary and unavoidable fill of five low-functioning Category III and Category IV wetlands (Wetlands A- E) on the subject property.

Compensatory mitigation for direct impacts to Wetlands A through E onsite will be provided by onsite, in-kind wetland creation, rehabilitation, and enhancement utilizing the combination compensation ratios as outlined under MMC 22E.010.120(3) and in accordance with the interagency mitigation guidance (WSDOE et. al, 2021). Additional wetland and stream buffer restoration actions will occur to create new functioning buffer areas between the mitigation areas and proposed development. The proposed onsite, in-kind mitigation actions have been designed utilizing interagency guidance to ensure no net loss of ecological functions onsite of within the greater Snohomish watershed (WRIA 7) in accordance with MMC 22E.010.120(2). Please see the *Conceptual Mitigation Plan* prepared by SVC dated March 30, 2022, for a full description of the proposed project impacts and mitigation to the onsite critical areas.

## Methods

The investigation consisted of a walk-through survey of the subject property to 1) determine location, size (diameter at breast height “DBH”), tree species and health (good, fair, poor, dead/dying) for significant trees, and 2) determine proximity, critical root zone (CRZ) and fall distance of trees to be retained in relation to the proposed development and its associated infrastructure. The tree assessment area was determined by the extent of the proposed development such that all trees that are proposed to be impacted or adjacent to the proposed clearing and grading were included in the assessment.

Significant trees were assessed based on the standards of AMC 20.76.120. Deciduous trees with a DBH of at least eight inches and evergreen trees with a DBH of at least twelve inches are deemed significant and shall be retained, unless the retention of such trees would unreasonably burden the development or cause a significant safety problem.

Trees were located using a high-accuracy Arrow 100 GNSS receiver unit and assigned a unique identification number. SVC’s ISA Certified Arborist assessed each tree and recorded species identification, tree DBH, and observations of health and structural condition. Tree health and risk assessments were made using current methodology in accordance with the standards and practices of the International Society of Arboriculture ANSI 300.

To calculate a single DBH for multi-stemmed trees, vector magnitude was applied, whereby the square root of the sum of the squares of the diameters of the stems is used. For example, a multi-stemmed tree with diameter measurements of 12-, 15-, and 28-inches results in the square root of 1,153 which is 34 inches in diameter. The critical root zone is calculated as one foot radius per one inch of trunk diameter.

Tree condition ratings are based on the following criteria. Further details and definitions are provided in Attachment A.

Good = Tree has no significant defects and is expected to survive without disturbance to its normal life expectancy.

Fair = Tree has either a minor or more substantial defect, either fungal decay or mechanical, that render it not likely to survive to normal life expectancy, depending on the species.

Poor = Tree has significant defects or mechanical issues that render it not likely to survive five years, depending on the species.

Dying = Tree is dying and lacks vigor.

Trees were categorized based on whether the trees will be retained along the property line or be removed if the trees or CRZ are located within the development footprint of the project site or if an impervious surface (pavement, building, etc.) will be located within twelve and one-half feet of any tree eighteen inches in diameter or more per AMC 20.76.120 (b). The number of trees onsite to be retained were based on location and observed metrics of direction of lean, structure and health.

## Results

The results of this report include the identification and discussion of 44 trees ranging from 13 to 55 inches DBH located along the narrow treed northeast boundary. A total of 11 trees assessed are recommended for retention outside of the grading limits.

Out of the 44 surveyed significant trees on site, 31 were black cottonwood (*Populus balsamifera*), with the remaining 13 trees being comprised of quaking aspen (*Populus tremuloides*), Hooker's willow (*Salix hookeriana*), bitter cherry (*Prunus emarginata*), river birch (*Betula nigra*), white bark birch (*Betula papyrifera*), and red alder (*Alnus rubra*). Trees along the western portion of the inventoried area had been previously headed but were resprouting. Additional cottonwoods appear to have been headed at approximately 15 feet within the past decade but were not assessed as they were not considered of sufficient quality, size or species to be considered habitat snags. Along the northeastern portion of the inventoried area, a small stand of aspen trees are growing and expanding north, but only one out of approximately 200 was considered significant.

## Tree Retention and Replanting Narrative

Per AMC 20.76.120, site development shall be sensitive to the preservation of significant trees, including the CRZ, and retain all significant trees unless the retention would unreasonably burden the development or cause a safety problem. For trees to be retained, no excavation or other subsurface disturbance may be undertaken within the CRZ where feasible, and no impervious surface may be located within twelve and one-half feet of any tree eighteen inches in diameter or more unless compliance would unreasonably burden the development. In addition, critical root zones shall be fenced prior to construction with orange plastic mesh fencing or approved equivalent. Any significant tree removed due to their unreasonable burden on the development shall be replaced with five-gallon-sized native species at a ratio of 3:1. If it is physically impossible to replant all replacement trees onsite, the loss of trees may be mitigated by either planting trees on public property within the city as approved by the community development director, and/or paying a mitigation fee into the city's tree mitigation in-lieu fund.

Four trees (Tree Numbers 3, 4, 12 and 27) are in poor condition and are recommended for removal as they may pose a risk to the proposed development to the north if they were to fail. An additional 15 trees contain codominant stems, multiple stems or have two stems that are basally joined (joined at the ground level) yet would be considered to be windfirm nonetheless as they have been exposed to strong winds without the protection of a surrounding forest for at least 30 years. However, the majority of the trees are black cottonwood trees which develop shallow root plates. As such, their

structural stability is at a considerable disadvantage if a significant portion of the root plate is disturbed or removed. Parking areas south of Buildings B, C and D to the southern parcel extents are proposed and include an additional seven feet of grading to the clearing limit. The impacts from the impervious surfaces and the angled grading limits encompass much of the area where the majority of the tree's roots are located. Although these trees act as a noise barrier, windbreak and provide habitat and sanctuary for birds and other animals, many will become structurally unstable with extensive impacts into their critical rooting zone. As such, 33 trees should either be removed (if cottonwoods) or turned into wildlife snags (all other species) where their rooting areas are extensively compromised (more than half of the CRZ).

A burgeoning aspen forest is establishing in and among this stand of trees. Although smaller in stature than the black cottonwood trees, they should be retained where feasible and permitted to continue growing throughout the area where the cottonwood trees will be removed. As approximately 200 aspen trees are growing in a cluster along the northeast parcel boundary of the windrow, a large number could be excavated with a backhoe, and transplanted in groups of 4 or more throughout this strip or elsewhere on site. Eleven trees are leaning to the south toward the vacant parcel, have sufficiently small trunk diameters whereby their rooting zones will be minimally impacted by the clearing limits or have sufficient canopy and rooting space and therefore should not pose a risk toward the proposed development even if they were to fail.

Where trees cannot be retained or transplanted, replacement will be required, either within this parcel boundary, within the reduced 100-foot buffer for Wetland F or the 150-foot buffer of Hayho Creek. Under AMC 20.76.120 (d) significant trees or significant stands of trees shall be replaced at a ratio of three to one. Therefore, 99 trees are required to be replanted or transplanted. Aspen trees or other tree species to be transplanted must be transplanted between October and March; roots must be immediately covered or situated within native soil, sufficiently watered in and/or temporary irrigation must be installed to avoid desiccation.

## **Closure**

The purpose of this Arborist Report is to evaluate the proposed project according to the tree retention and replanting requirements of AMC 20.76.120. Construction impacts to trees should be avoided where feasible and assessed by a certified arborist to determine tree protection areas when grading near a tree's critical root zone.

All observations regarding trees in this report were made by a certified arborist based on education and professional experience. All determinations of health condition, structural condition, or hazard potential of a tree or trees at issue are based on current methodology and best available science. All health and hazard determinations are limited by the visual nature of the assessment. Defects may be obscured by soil, brush, vines, aerial foliage, branches, multiple trunks, or other trees. Even structurally sound, healthy trees are wind thrown during severe storms or fail due to other weather conditions. As such a determination is not a guarantee of sound health, or lack of risk.

The findings and conclusions documented in this assessment report have been prepared for specific application to the 51<sup>st</sup> Ave NE site. These findings and conclusions have been developed in a manner consistent with that level of care and skill normally exercised by members of the environmental science profession currently practicing under similar conditions in the area. The conclusions and recommendations presented in this report are professional opinions based on an interpretation of information currently available to us and are made within the operation scope, budget, and schedule

of this project. No warranty, expressed or implied, is made. In addition, changes in government codes, regulations, or laws may occur. Due to such changes, our observations and conclusions applicable to this assessment may need to be revised wholly or in part in the future.

Any trees to be retained shall be in good health and free from damage and defects. During and following site clearing and construction activities, trees designated for retention that are determined to be unhealthy or damaged and pose a hazard shall be removed. Due to the inherent risk of failure from severe weather, undetectable and hidden disease, defect, and damage of the trees to be retained, Soundview Consultants LLC assumes no liability of bodily injury, death, or property damage resulting from failure of the trees to be retained. This plan is preliminary and based on preliminary site layout and design. The final tree retention plan is subject to change based on approved construction plans.

Sincerely,



International Society  
of Arboriculture

A handwritten signature in blue ink that reads "Shauna Willett".

Shauna Willett  
Certified Arborist #  
WE-7452A

A handwritten signature in black ink that reads "Jon Pickett".

---

Jon Pickett  
Principal

## References

- Arlington Municipal Code. 2021. Arlington Municipal Code Section 20.76: Screening and Trees.  
[https://library.municode.com/wa/arlington/codes/code\\_of\\_ordinances?nodeId=TTT20ZO\\_C H20.76SCTR](https://library.municode.com/wa/arlington/codes/code_of_ordinances?nodeId=TTT20ZO_C H20.76SCTR)
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- Soundview Consultants, LLC (SVC. 20222. *Conceptual Mitigation Plan: Rex Development*. March 30, 2022. Gig Harbor, Washington.

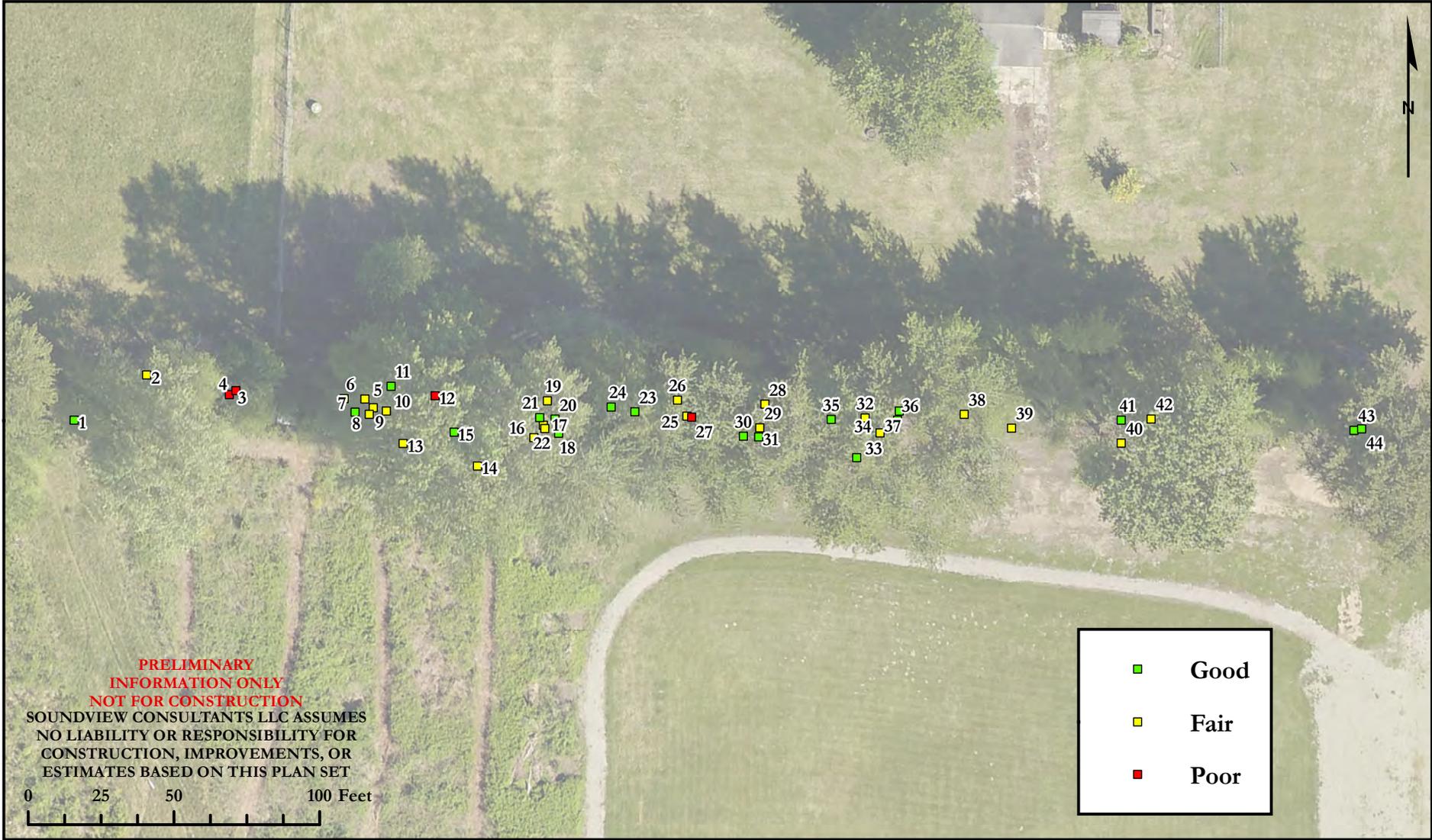
# Attachment A – Tree Health and Condition Definitions

| Condition  | Symbol | Definition  |
|--|--------|---|
| Excellent  | E      | Nearly ideal specimen with excellent form and vigor   |
|  |        | Well-balanced and nearly symmetric crown  |
|  |        | Normal to excellent shoot elongation on new growth  |
|  |        | Little to no twig dieback or discoloration of leaves  |
|  |        | No apparent pest or disease problems  |
|  |        | Sound, solid trunk free of defects and mechanical damage<br>Tree should live to full life expectancy for species  |
| Good   | G      | Vigor is normal for the species   |
|  |        | Full or nearly full canopy  |
|  |        | Well-balanced or partially asymmetric crown   |
|  |        | No dieback to branches > 2" in diameter   |
|  |        | Twig dieback and leaf discoloration are minor   |
|  |        | Minor pest or disease problems are manageable   |
|  |        | Tree is reacting appropriately to damage  |
| Sound, solid trunk free of defects and mechanical damage<br>Tree should live to full life expectancy for species |        |   |
| Fair   | F      | Reduced vigor, new growth may be stunted  |
|  |        | Thinning canopy, asymmetric or inconsistent form  |
|  |        | Suckering or secondary growth may be present  |
|  |        | Twig and branch dieback may comprise up to 50% of canopy  |
|  |        | Minor pest or disease problems are visible but not fatal  |
|  |        | Tree is reacting appropriately to damage<br>Single or multiple defects (codominant stem, uncorrected lean, forked leader) are not practical to correct<br>Life expectancy shortened to 10-40 years depending on species                   |
| Poor   | P      | Tree is declining and appears unhealthy   |
|  |        | Thinning canopy, asymmetric or inconsistent form  |
|  |        | Suckering or secondary growth may be present  |
|  |        | Twig and branch dieback may comprise more than 50% of crown   |
|  |        | Pest or disease problems are uncontrollable and likely fatal  |
|  |        | Extensive decay or cavities present in trunk and/or branches<br>Single or multiple defects (codominant stem, forked leader, uncorrected lean) are not practical to correct<br>Life expectancy shortened to 1-5 years depending on species |
| Dying  | DY     | Tree is dying and lacks vigor   |
|  |        | Little live foliage   |
|  |        | Suckering or secondary growth is dominant growth  |
|  |        | Twig and branch dieback may comprise more than 80% of crown<br>Life expectancy shortened to 1-3 years depending on species  |
| Dead   | D      | Tree is dead  |

# Attachment B – Tree Retention Plan

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# TREE ASSESSMENT




**Soundview Consultants LLC**  
Environmental Assessment • Planning • Land Use Solutions

2907 Harborview Dr., Suite D, Gig Harbor, WA 98335  
Phone: (253) 514-8952 Fax: (253) 514-8954  
[www.soundviewconsultants.com](http://www.soundviewconsultants.com)

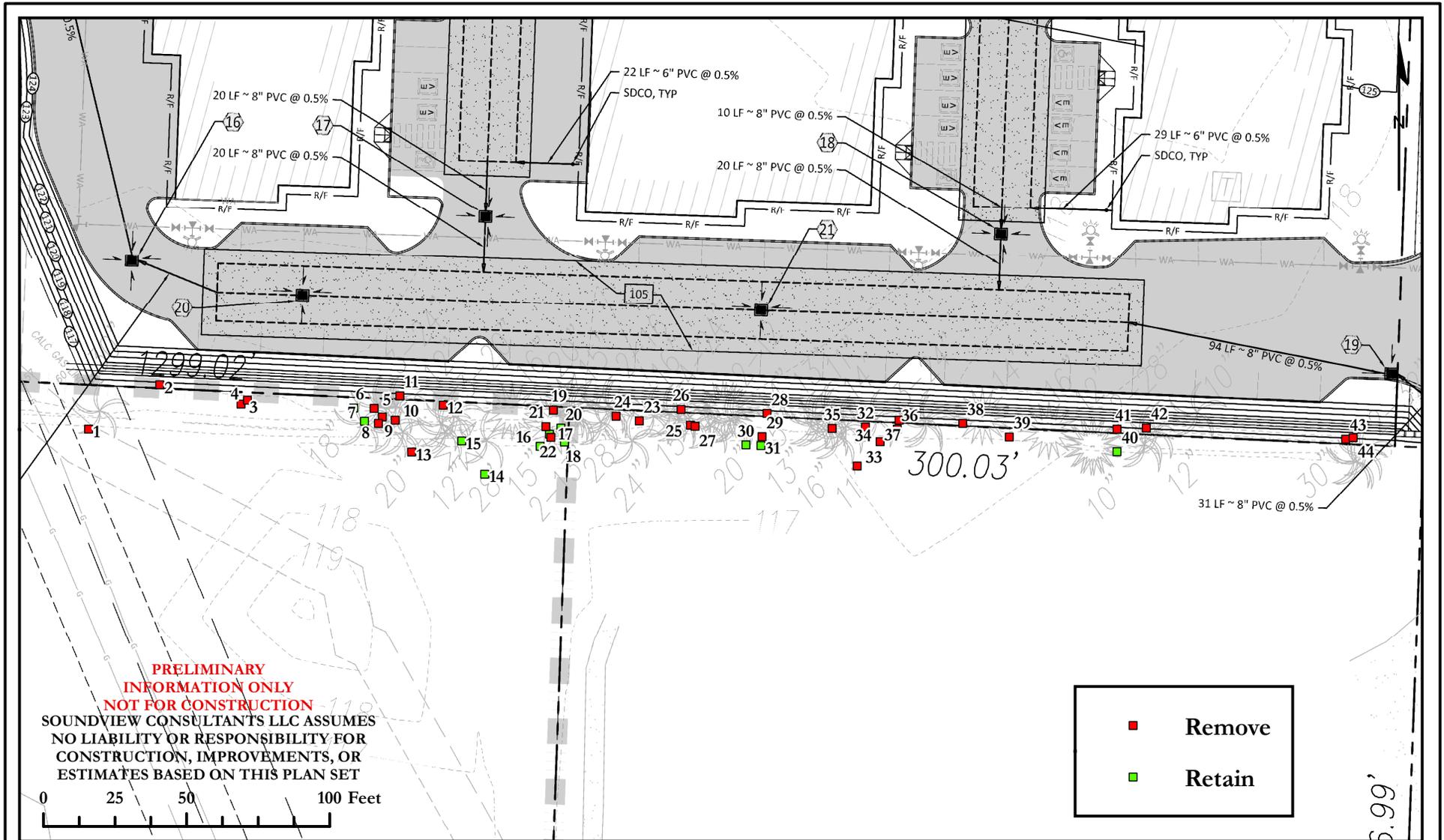
**MARYSVILLE**

15808 & 16204 51ST AVENUE NE  
MARYSVILLE, WA 98271-7506

SNOHOMISH COUNTY PARCEL NUMBERS:  
31052800400100 & 31052800400400

|                     |
|---------------------|
| DATE: 9/6/2023      |
| JOB: 1778.0003      |
| BY: DLS             |
| SCALE: 1" = 50'     |
| FIGURE NO. <b>1</b> |

# TREE RETENTION




**Soundview Consultants LLC**  
Environmental Assessment • Planning • Land Use Solutions  
2907 Harborview Dr., Suite D, Gig Harbor, WA 98335  
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31052800400100 & 31052800400400

|                 |
|-----------------|
| DATE: 9/6/2023  |
| JOB: 1778.0003  |
| BY: DLS         |
| SCALE: 1" = 50' |
| FIGURE NO. 2    |

# Attachment C – Tree Assessment Spreadsheet

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| TREE NUMBER | SPECIES          | DBH | CONDITION | RETAIN/REMOVE | NOTES  |
|-------------|------------------|-----|-----------|---------------|--|
| 1           | Black cottonwood | 43  | Good      | Remove        |  |
| 2           | River birch      | 20  | Fair      | Remove        | River birch, large limbs removed, heading cuts on limbs, but healthy |
| 3           | Black cottonwood | 31  | Poor      | Remove        | Headed at 18 feet, regrowing   |
| 4           | Black cottonwood | 13  | Poor      | Remove        | Headed at 18 feet, regrowing   |
| 5           | Black cottonwood | 30  | Fair      | Remove        | Codominant stem  |
| 6           | River birch      | 16  | Fair      | Retain        | 10+12, codominant stem, River Birch                                  |
| 7           | Black cottonwood | 27  | Good      | Retain        |  |
| 8           | Black cottonwood | 28  | Fair      | Remove        |  |
| 9           | Black cottonwood | 20  | Fair      | Remove        |  |
| 10          | Black cottonwood | 24  | Fair      | Remove        |  |
| 11          | Red alder        | 16  | Good      | Remove        | Opposite (N) side chain link fence                                   |
| 12          | Bitter cherry    | 13  | Poor      | Remove        | Hollow, advanced decay   |
| 13          | Black cottonwood | 45  | Fair      | Remove        | 27+27 +25, codominant stem tree, basally joined with 25 inch stem    |
| 14          | Hookers willow   | 21  | Fair      | Retain        | 10+19, Willow species, larger limb leans South                       |
| 15          | Black cottonwood | 35  | Good      | Retain        |  |
| 16          | Bitter cherry    | 14  | Fair      | Retain        |  |
| 17          | Black cottonwood | 13  | Fair      | Retain        | Slight kink at 9 feet, slight lean to S.                             |
| 18          | Red alder        | 19  | Good      | Retain        |  |
| 19          | Black cottonwood | 29  | Fair      | Remove        | 16+13+21, one codominant, one basally joined stem                    |
| 20          | White bark birch | 16  | Good      | Retain        | White bark birch, lean to N.   |
| 21          | Black cottonwood | 28  | Good      | Remove        |  |
| 22          | Black cottonwood | 35  | Fair      | Remove        | Codominant stem at 5 feet  |
| 23          | Black cottonwood | 28  | Good      | Remove        | Slight lean to S   |
| 24          | Black cottonwood | 20  | Good      | Remove        |  |
| 25          | Black cottonwood | 43  | Fair      | Remove        | Triple stem, one stem dead, union at 5 feet                          |
| 26          | Black cottonwood | 31  | Fair      | Remove        | 15+27, codominant stem   |
| 27          | Hookers willow   | 25  | Poor      | Remove        | Hookers Willow, oozing sap, internal decay                           |
| 28          | River birch      | 17  | Fair      | Remove        | 12+12, river birch, basally joined                                   |
| 29          | Black cottonwood | 25  | Fair      | Remove        | 18+ 18, codominant stem at 2 feet                                    |
| 30          | Black cottonwood | 19  | Good      | Retain        |  |
| 31          | Black cottonwood | 17  | Good      | Retain        |  |
| 32          | Black cottonwood | 23  | Fair      | Remove        | 14+18, codominant stem at 2 feet                                     |
| 33          | Black cottonwood | 24  | Good      | Remove        |  |
| 34          | Black cottonwood | 15  | Fair      | Remove        |  |
| 35          | Black cottonwood | 18  | Good      | Remove        |  |
| 36          | Black cottonwood | 31  | Good      | Remove        |  |
| 37          | Black cottonwood | 42  | Good      | Remove        | 30+30, codominant stem at 1 foot                                     |
| 38          | Bitter cherry    | 17  | Fair      | Remove        | 16+5, basally joined subdominant stem                                |
| 39          | River birch      | 18  | Fair      | Remove        | River birch  |
| 40          | Aspen            | 18  | Fair      | Retain        | Aspen, tight union, codominant stem at 4 feet                        |
| 41          | Black cottonwood | 55  | Good      | Remove        | Codominant stem with good basal union                                |
| 42          | Black cottonwood | 18  | Fair      | Remove        |  |
| 43          | Black cottonwood | 48  | Good      | Remove        | Twin giant cottonwoods, but not basally joined                       |
| 44          | Black cottonwood | 48  | Good      | Remove        |  |

## Attachment C – Qualifications

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All field inspections, assessments, and supporting documentation, including this *Arborist Report* prepared for 51<sup>st</sup> Ave NE, were prepared by or under the direction of Jon Pickett of SVC. Site investigation was completed by Shauna Willett, and report preparation was completed by Cody Berthiaume.

### Jon Pickett

Principal

Professional Experience: 15 years

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Jon Pickett is a Principal and Senior Scientist with a diverse background in environmental and shoreline compliance and permitting, wetland and stream ecology, fish and wildlife biology, mitigation compliance and design, and environmental planning and land use due diligence. Jon oversees a wide range of large-scale industrial, commercial, and multi-family residential projects throughout Western Washington, providing environmental permitting and regulatory compliance assistance for land use entitlement projects from feasibility through mitigation compliance. Jon performs wetland, stream, and shoreline delineations and fish & wildlife habitat assessments; conducts code and regulation analysis and review; prepares reports and permit applications and documents; provides environmental compliance recommendation; and provides restoration and mitigation design.

Jon earned a Bachelor of Science degree in Natural Resource Sciences from Washington State University and Bachelor of Science and Minor in Forestry from Washington State University. Jon has received 40-hour wetland delineation training (Western Mountains, Valleys, & Coast and Arid West Regional Supplements) and regularly performs wetland, stream, and shoreline delineations. Jon is a Whatcom County Qualified Wetland Specialist and Wildlife Biologist and is a Pierce County Qualified Wetland Specialist. He has been formally trained by WSDOE in the use of the Washington State Wetland Rating System 2014, How to Determine the Ordinary High-Water Mark (Freshwater and Marine), Using Field Indicators for Hydric Soils, and the Using the Credit-Debit Method for Estimating Mitigation Needs.

### Shauna Willett

Certified Arborist and Environmental Scientist

Professional Experience: 15 years

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Shauna Willett is an Environmental Scientist and ISA Certified Arborist. She has performed individual tree assessments, tree inventories and environmental assessments of many habitats including oak woodlands, forests, riparian corridors, and wetlands of the Puget Sound region and throughout California. She has worked as a consulting arborist in the residential, commercial, and utility sectors of arboriculture where she conducted preventative maintenance inspections of distribution and high voltage transmission lines for Puget Sound Energy. This assessment work has involved field identification of tree and plant species, pest and disease diagnosis, and data collection and analysis in public and private sectors. Her research background is highly varied, spanning the fields of agriculture, nutrition - domestically and internationally, aquatic toxicology and urban forestry. Shauna received her master's degree in geography with a dual emphasis in urban forestry and landscape architecture at the University of California, Davis. Shauna is a Tree Risk Assessment Qualified (ISA) arborist. She has extensive knowledge on local plant taxonomy and ecological vegetative indicators.

Shauna currently performs tree assessments, wetland and stream delineations, fish and wildlife habitat assessments; conducts environmental code analysis; creates and modifies maps and tree surveys using AutoCAD, prepares environmental assessment and mitigation reports, biological evaluations, and permit applications to support clients through the regulatory and planning process for various land use projects. She has been formally trained by the Washington State Department of Ecology in the use of the Washington State Wetland Rating System. Shauna earned a Bachelor of Science degree in Landscape Architecture from the University of California, Davis, with a focus on the relationship between communities and their urban forest ecosystems.

## **Cody Berthiaume**

Staff Scientist

Professional Experience: 5+ years

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Cody Berthiaume is a Staff Scientist with a background in wildlife research, ecological monitoring, and natural resource management. Cody's experience comes from a variety of seasonal positions, spanning multiple disciplines and ecosystems. Currently, he assists with tree assessments, wetland delineations, and report writing. Previously, he has contributed to the creation and implementation of field protocols regarding arboreal surveys and captures of red tree voles in working timber stands. Cody has also led remote field crews collecting standardized vegetation and soil data (AIM/IIRH), in conjunction with the Bureau of Land Management. Additionally, as an AmeriCorps volunteer, Cody has worked closely with NPS personnel assisting with invasive species removal and priority wildlife and habitat monitoring. Cody graduated from the University at Buffalo with a Bachelor of Science in Environmental Studies with a concentration in Environmental Resources & Management.

## **Section VII – Other Permits**

### **Section VII Summary**

#### *Narrative*

This project will require the following additional permits/approvals beyond those required by the City of Arlington.

1. Construction Stormwater General Permit by the Washington State Department of Ecology.

## **Section VIII – Operation and Maintenance Manual**

### **Section VIII Summary**

#### *Narrative*

The Operation and Maintenance Manual is a standalone document that will be given to the property manager following the construction of the project. The contractor will be responsible for the maintenance and operation of all stormwater structures and BMPs requiring maintenance during construction, and, after construction, responsibility will pass to the property management company. The manual shall be kept in the offices of the proposed buildings. Upon request by the City, it shall be made available for their inspection. It is generally expected that few to none of these defects will be present upon the yearly inspection of each facility.

**Williams Investments Commercial Park  
16430 51<sup>st</sup> Ave NE  
Arlington, WA 98223**

**OPERATION AND MAINTENANCE MANUAL**

**Date: September 2023**



250 4th Avenue South, Suite 200  
Edmonds, WA 98020  
ph. 425.778.8500 | f. 425.778.5536  
[www.cgeengineering.com](http://www.cgeengineering.com)

## Operation and Maintenance Manual

This Operation and Maintenance Manual has been created for Williams Investments Commercial Park, a 19.38 ac site located at 16430 51<sup>st</sup> Ave NE, Arlington, WA 98223. The proposed stormwater management system consists of catch basins and conveyance pipes that collect runoff from roofs, parking, and new landscaping, and route them to gravel infiltration trenches under parking lots throughout the site.

Included in this Operation and Maintenance Manual is an 11" x 17" grading and drainage plan sheet showing the locations of the infiltration system and catch basins. Please note that this map is generated during the design phase and may not reflect all changes made in permitting and construction. CG Engineering may be contacted for an updated copy of this map once the as-built drawings are completed for the site. Maintenance sheets from the 2019 Stormwater Management Manual for Western Washington are included for the following facilities:

**Catch Basins:** Concrete structures with steel grates that collect stormwater runoff from the site and act as junctions for storm conveyance pipes. See "No. 5" for maintenance.

**Gravel Infiltration Trench:** Subsurface trenches backfilled with a coarse stone aggregate, allowing for temporary storage of stormwater runoff in the voids of the aggregate. Runoff is distributed through the trench with a perforated pipe and gradually infiltrates into the surrounding soil.

**Vegetation Management:** Landscaping can include grading, soil transfer, vegetation removal, pesticide and fertilizer applications, and watering. Stormwater contaminants include toxic organic compounds, heavy metals, oils, total suspended solids, coliform bacteria, fertilizers, and pesticides.

Facilities shall be inspected for defects listed in the following facility sheets. Most maintenance tasks are generally reactionary to a defect being found, rather than a matter of constant upkeep. It is generally expected that few to none of these defects will be present upon the yearly inspection of each facility. The facility sheets list the potential conditions warranting maintenance and the expected result following any maintenance. Several engineer's notes for specific tasks are provided within the facility sheets. **Unless otherwise noted on the facility sheets the maintenance tasks should be performed on an "as needed" basis:**

- (a) When the described defect is visible to whomever performs the yearly inspection,
- (b) Should any defect become apparent between inspections.

A PORTION OF THE SW 1/4, NE 1/4 & NORTH 1/2 & SE 1/4, SE 1/4, SECTION 28, TOWNSHIP 31 NORTH, RANGE 5 EAST, W.M.



**GRADING AND DRAINAGE NOTES:**

1. SEE C3.2, C3.3, C3.4 & C3.5 FOR 30 SCALE PLANS.
2. 1.5% (2% MAX) CROSS SLOPE AND 4.5% (5% MAX) RUNNING SLOPE FOR ALL SIDEWALKS AND WALKWAYS ON AND OFF SITE. 1.5% (2% MAX) CROSS SLOPE IN ALL DIRECTIONS AT CHANGE IN DIRECTIONS AND CROSSING IN SIDEWALKS AND WALKWAYS, RAMP/STAIR LANDINGS, VEHICULAR WAY CROSSINGS, VEHICULAR LOADING ZONES, ACCESSIBLE PARKING SPACES/AISLES, ROUTES (WHETHER OR NOT STRIPED) TO ACCESSIBLE GARAGE SPACES (AND FLUSH MAN-DOOR THRESHOLD), ENTRY DOOR MANEUVERING SPACES, TRASH AREAS, AND AT AMENITY AREAS.
3. 1.5% (2% MAX) SLOPE IN ALL DIRECTIONS IN HANDICAP PARKING AND LOADING ZONES.
4. 7.5% (8.33% MAX) RAMP SLOPE WITH A 5.0' MIN LEVEL LANDING AT THE TOP, INTERMEDIATE, AND BOTTOM OF RAMP. HANDRAILS ARE REQUIRED ON BOTH SIDES IF RAMP RUNS HAVE A RISE GREATER THAN 0.5'. SEE C6.1 FOR HANDRAIL LOCATIONS.
5. TOP AND TOE ELEVATIONS ON WALLS REFER TO GRADE, NOT THE PHYSICAL TOP AND BOTTOM OF THE WALL.

**GRADING QUANTITIES**

|                          |                         |
|--------------------------|-------------------------|
| TOTAL EXCAVATION (CUT) - | 8,500.00 CU YDS TOTAL   |
| EMBANKMENT (FILL) -      | 90,000.00 CU YDS        |
| <b>TOTAL</b>             | <b>98,500.00 CU YDS</b> |

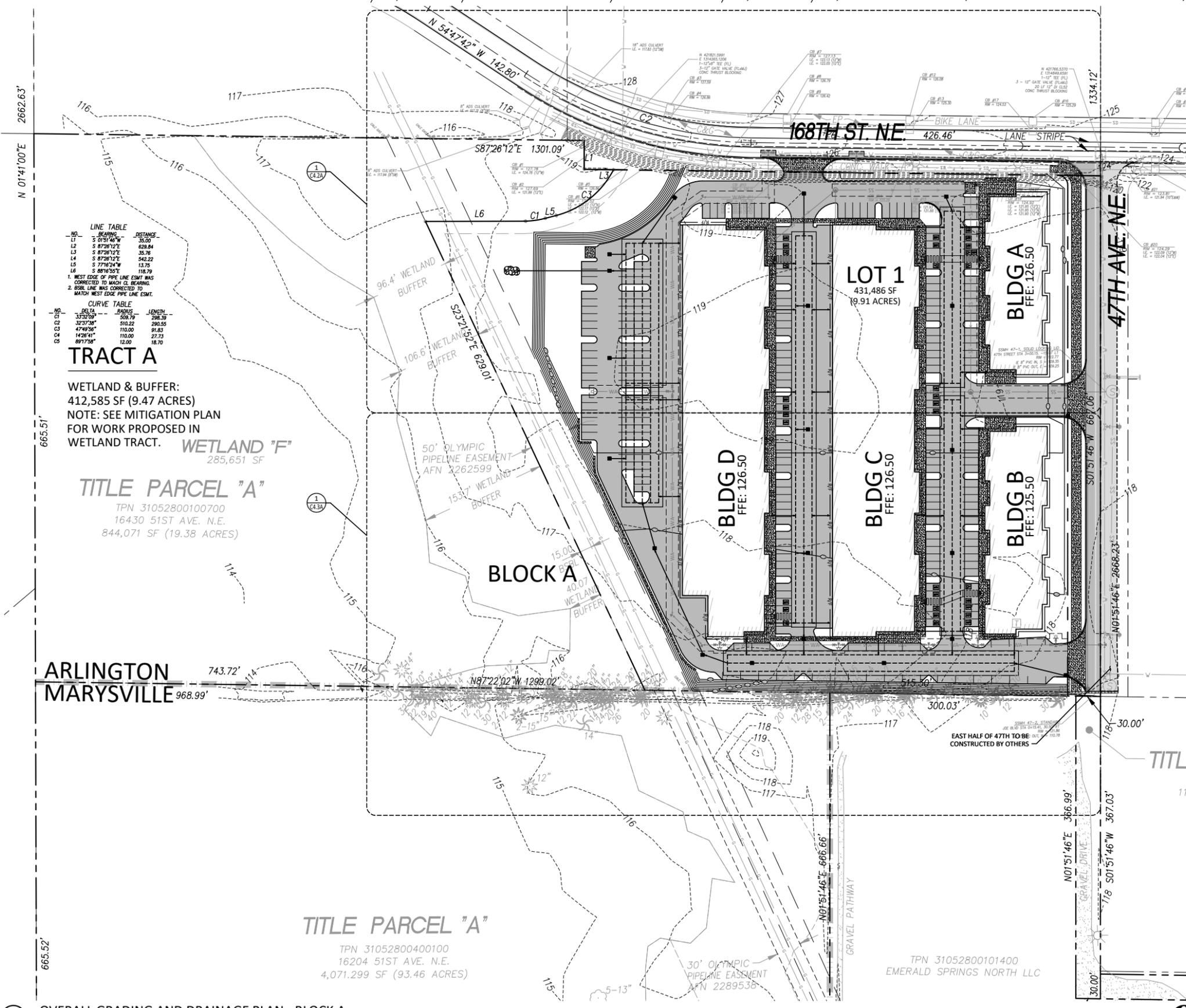
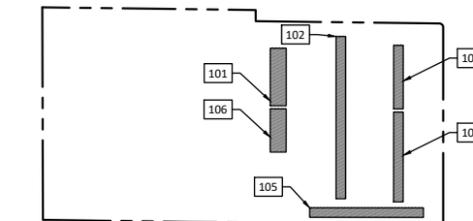
THE QUANTITIES SHOWN ABOVE ARE FOR THE PERMIT PROCESS ONLY. THESE VALUES ARE APPROXIMATE. DO NOT USE FOR BIDDING, PAYMENT, OR ESTIMATING PURPOSES.

**INFILTRATION TRENCH TABLE**

| MARK         | SURFACE AREA (SF)   | TOP    | BOTTOM | GROUNDWATER |
|--------------|---------------------|--------|--------|-------------|
| 101          | 180' x 50' = 9,000  | 121.50 | 119.50 | 118.0       |
| 102          | 480' x 30' = 14,400 | 121.50 | 119.50 | 118.0       |
| 103          | 219' x 30' = 6,570  | 121.50 | 119.50 | 118.0       |
| 104          | 291' x 30' = 8,730  | 121.50 | 119.50 | 118.0       |
| 105          | 360' x 30' = 10,800 | 121.50 | 119.50 | 118.0       |
| 106          | 135' x 50' = 6,750  | 121.50 | 119.50 | 118.0       |
| <b>TOTAL</b> | <b>56,250 SF</b>    |        |        |             |

NOTES:  
1. REFER TO DETAIL 1/C3.5A FOR INFILTRATION SECTION.

**INFILTRATION TRENCH KEY PLAN**



**LINE TABLE**

| NO. | BEARING      | DISTANCE |
|-----|--------------|----------|
| L1  | S 01°51'46"W | 35.00    |
| L2  | S 87°28'12"E | 628.84   |
| L3  | S 87°28'12"E | 35.76    |
| L4  | S 87°28'12"E | 542.22   |
| L5  | S 77°42'24"W | 13.75    |
| L6  | S 88°16'55"E | 118.79   |

1. WEST EDGE OF PIPE LINE ESMT WAS CORRECTED TO MATCH C2 BEARING.  
2. B55L LINE WAS CORRECTED TO MATCH WEST EDGE PIPE LINE ESMT.

**CURVE TABLE**

| NO. | DELTA     | CHORDS | LENGTH |
|-----|-----------|--------|--------|
| C1  | 33°32'00" | 559.79 | 598.59 |
| C2  | 32°37'38" | 510.22 | 290.55 |
| C3  | 47°49'56" | 110.00 | 91.83  |
| C4  | 14°26'41" | 110.00 | 27.73  |
| C5  | 89°17'58" | 12.00  | 18.70  |

**TRACT A**

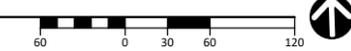
WETLAND & BUFFER:  
412,585 SF (9.47 ACRES)  
NOTE: SEE MITIGATION PLAN FOR WORK PROPOSED IN WETLAND TRACT. **WETLAND "F"**  
285,651 SF

**TITLE PARCEL "A"**  
TPN 31052800100700  
16430 51ST AVE. N.E.  
844,071 SF (19.38 ACRES)

**TITLE PARCEL "A"**  
TPN 31052800400100  
16204 51ST AVE. N.E.  
4,071,299 SF (93.46 ACRES)

ARLINGTON  
MARYSVILLE

**1 OVERALL GRADING AND DRAINAGE PLAN - BLOCK A**  
SCALE: 1" = 60'



**CITY OF ARLINGTON  
CONSTRUCTION DRAWING REVIEW APPROVAL**

THIS PLAN SHEET HAS BEEN REVIEWED AND APPROVED PER THE CONDITIONS ON THE TITLE SHEET.

BY: \_\_\_\_\_

DATE: \_\_\_\_\_ THIS APPROVAL IS VALID FOR 18 MONTHS



| MARK | DATE     | DESCRIPTION      |
|------|----------|------------------|
|      | 09/05/23 | PERMIT SUBMITTAL |

DESIGN: NAT  
DRAWN: ATD  
CHECK: JPU  
JOB NO: 20084.20  
DATE: 09/05/23

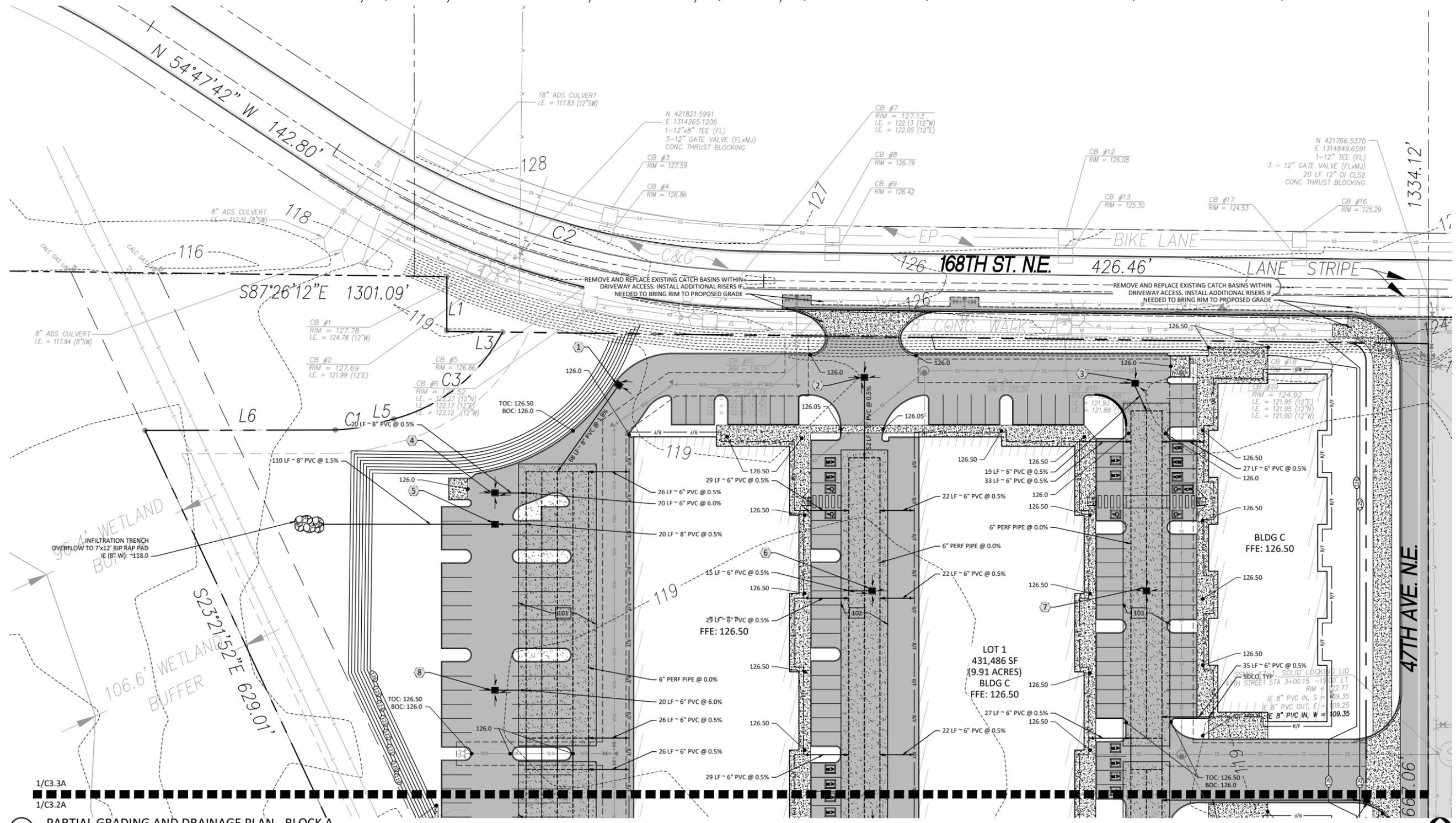
WILLIAMS INVESTMENTS COMMERCIAL PARK  
ARLINGTON BINDING SITE PLAN  
16430 51ST AVE NE  
ARLINGTON, WA 98223

OVERALL GRADING  
AND DRAINAGE PLAN - BLOCK A

SHEET:

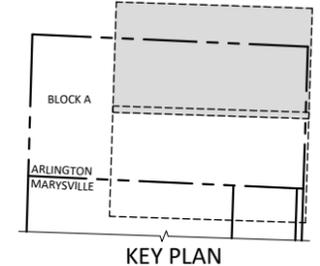
**C3.1A**

A PORTION OF THE SW 1/4, NE 1/4 & NORTH 1/2 & SE 1/4, SECTION 28, TOWNSHIP 31 NORTH, RANGE 5 EAST, W.M.



1/C3.3A  
 1/C3.2A  
**1 PARTIAL GRADING AND DRAINAGE PLAN - BLOCK A**  
 SCALE: 1" = 30'

- PARTIAL GRADING PLAN NOTES:**
- A MINIMUM CLEAR PATH WIDTH OF 44" IS REQUIRED FOR ALL EXTERIOR ACCESSIBLE ADA ROUTES.
  - ALL ACCESSIBLE PARKING SPACES SHALL INCLUDE VERTICAL SIGNS PER WA STATE AMENDMENT 1101.2.9.



**CITY OF ARLINGTON  
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|------|----------|------------------|
|      | 09/05/23 | PERMIT SUBMITTAL |

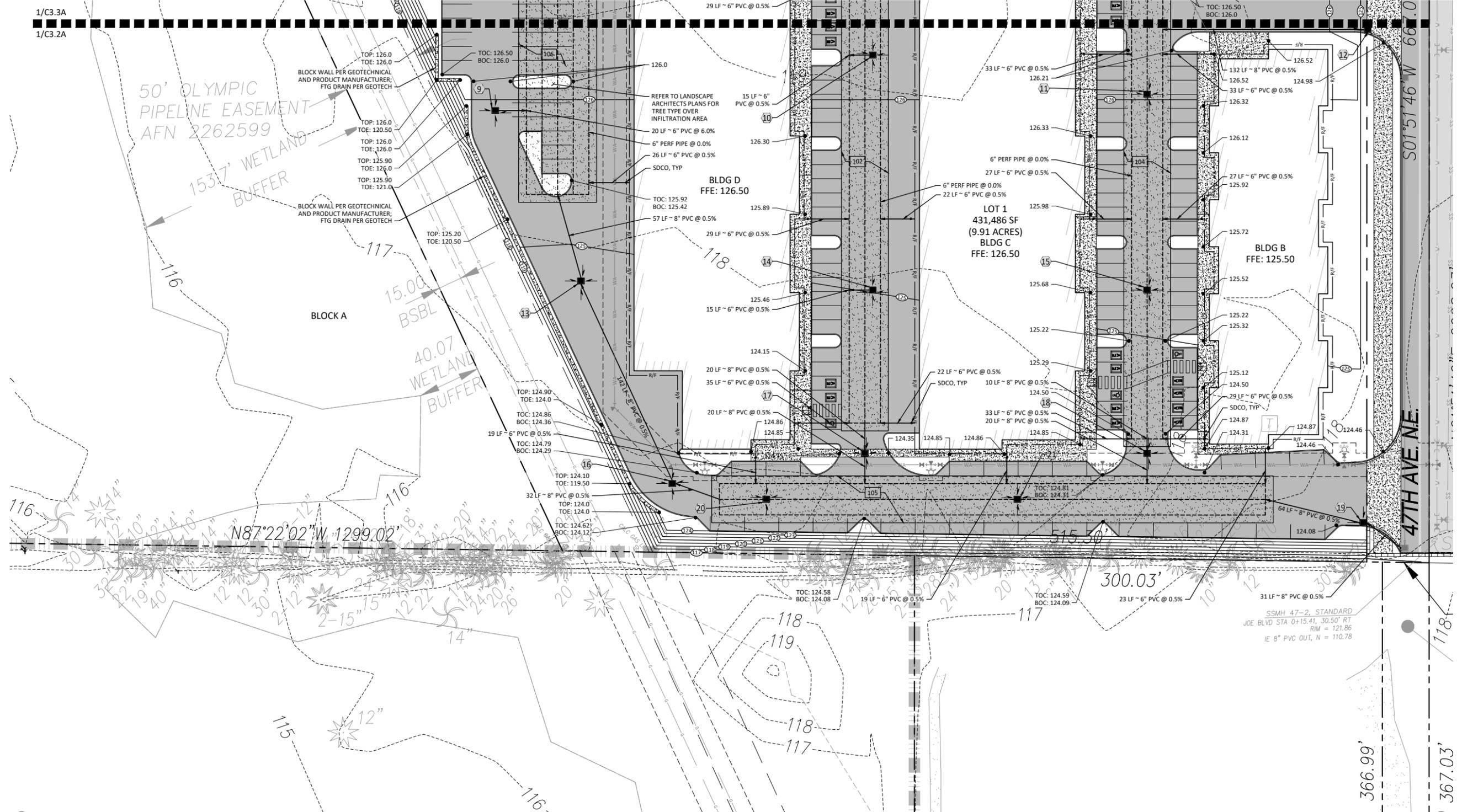
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|---------|----------|
| DESIGN: | NAT      |
| DRAWN:  | ATD      |
| CHECK:  | JPU      |
| JOB NO: | 20084.20 |
| DATE:   | 09/05/23 |

**WILLIAMS INVESTMENTS COMMERCIAL PARK  
 ARLINGTON BINDING SITE PLAN  
 16430 51ST AVE NE  
 ARLINGTON, WA 98223**

**PARTIAL GRADING  
 AND DRAINAGE PLAN - BLOCK A**

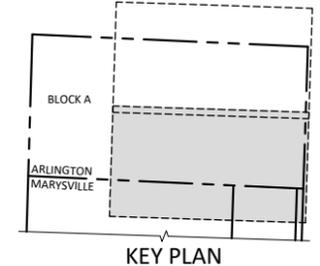
SHEET:  
**C3.2A**

A PORTION OF THE SW 1/4, NE 1/4 & NORTH 1/2 & SE 1/4, SE 1/4, SECTION 28, TOWNSHIP 31 NORTH, RANGE 5 EAST, W.M.



**1 PARTIAL GRADING AND DRAINAGE PLAN - BLOCK A**  
 SCALE: 1" = 30'

- PARTIAL GRADING PLAN NOTES:**
1. A MINIMUM CLEAR PATH WIDTH OF 44" IS REQUIRED FOR ALL EXTERIOR ACCESSIBLE ADA ROUTES.
  2. ALL ACCESSIBLE PARKING SPACES SHALL INCLUDE VERTICAL SIGNS PER WA STATE AMENDMENT 1101.2.9.



**CITY OF ARLINGTON  
 CONSTRUCTION DRAWING REVIEW APPROVAL**

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|------|----------|------------------|
|      | 09/05/23 | PERMIT SUBMITTAL |

DESIGN: NAT  
 DRAWN: ATD  
 CHECK: JPU  
 JOB NO: 20084.20  
 DATE: 09/05/23

**WILLIAMS INVESTMENTS COMMERCIAL PARK  
 ARLINGTON BINDING SITE PLAN  
 16430 51ST AVE NE  
 ARLINGTON, WA 98223**

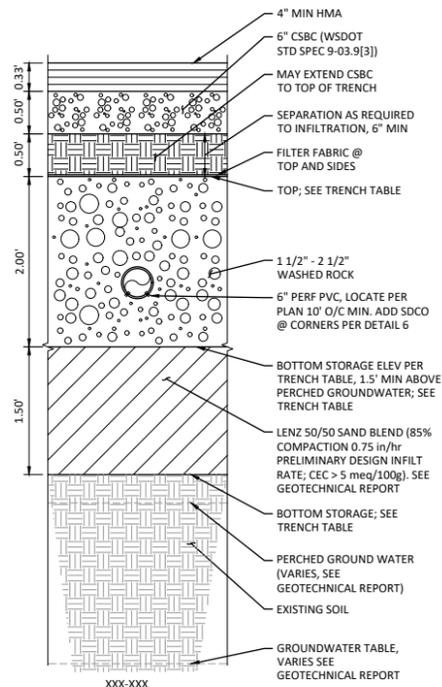
**PARTIAL GRADING  
 AND DRAINAGE PLAN - BLOCK A**

SHEET:  
**C3.3A**

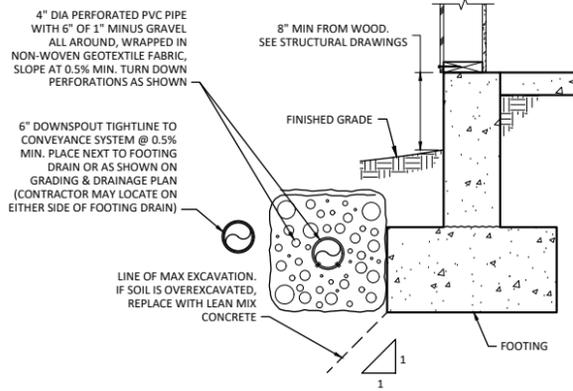




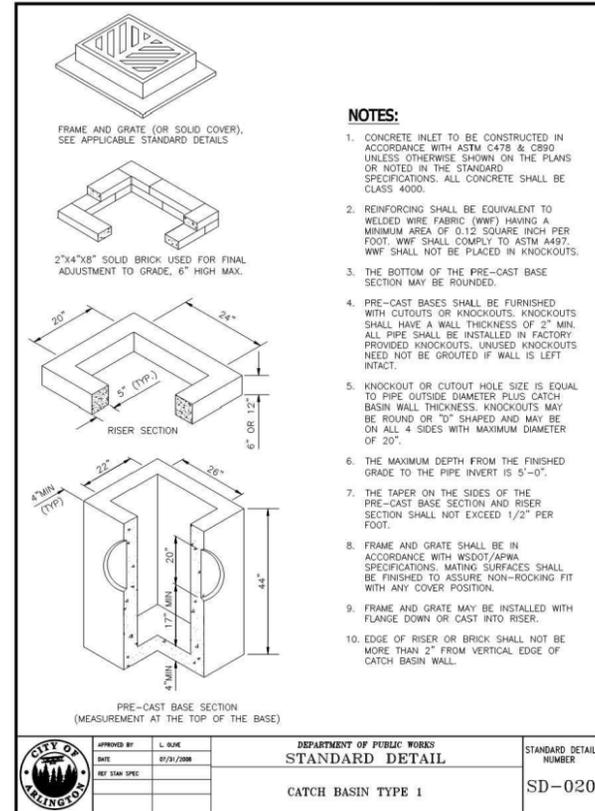
09/05/23



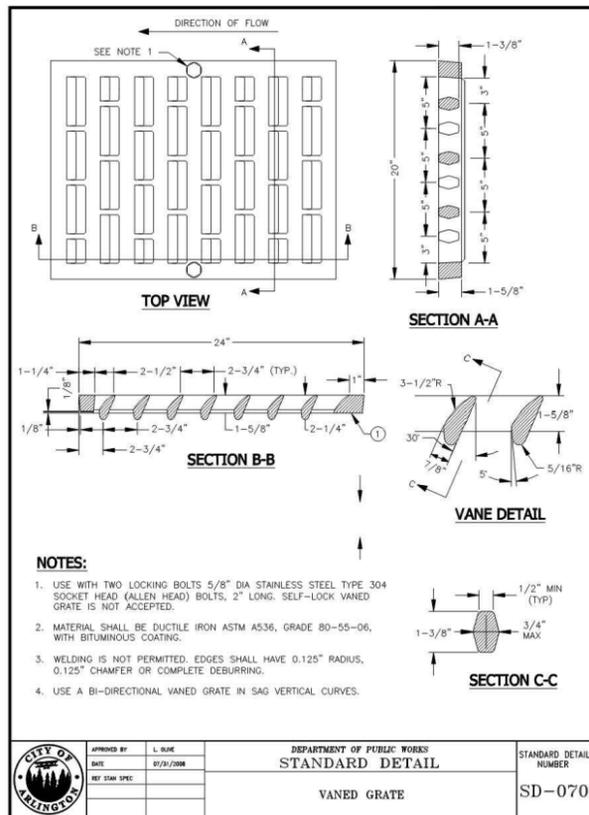
**1 INFILTRATION SECTION/PVMT SECTION @ INFILTRATION**  
 SCALE: 1" = 1'-0"



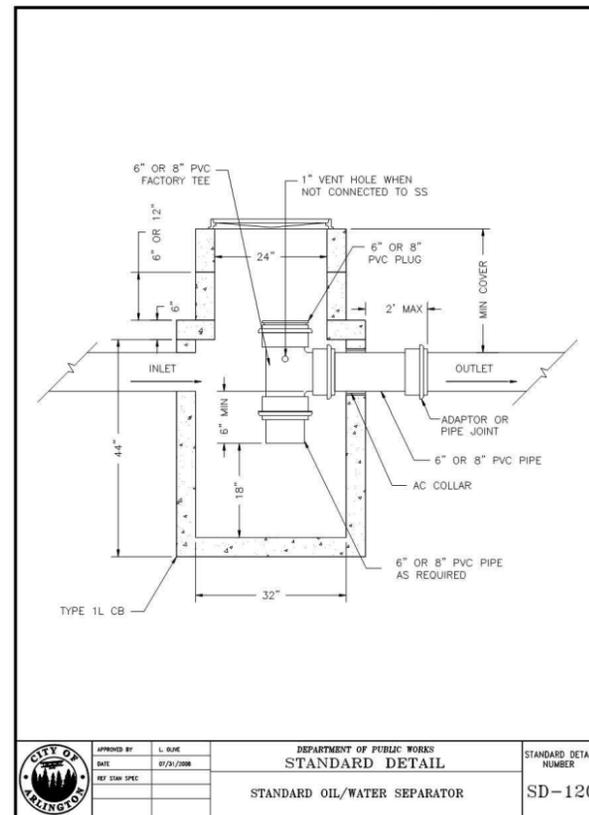
**2 FOOTING AND ROOF DRAIN SECTION**  
 SCALE: NTS



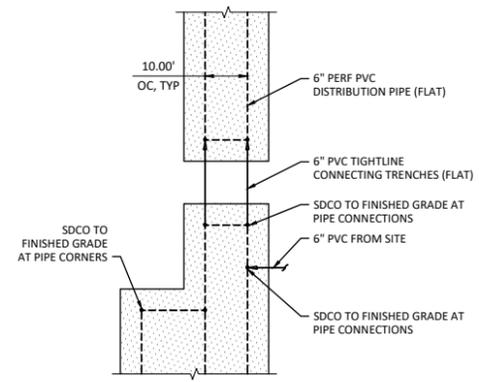
**3 CITY OF ARLINGTON STANDARD DETAIL**  
 SCALE: NTS



**4 CITY OF ARLINGTON STANDARD DETAIL**  
 SCALE: NTS



**5 CITY OF ARLINGTON STANDARD DETAIL**  
 SCALE: NTS



**6 INFILTRATION PIPE & CLEANOUT DETAIL**  
 SCALE: 1" = 20"

**CITY OF ARLINGTON**  
**CONSTRUCTION DRAWING REVIEW APPROVAL**

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BY: \_\_\_\_\_

DATE: \_\_\_\_\_ THIS APPROVAL IS VALID FOR 18 MONTHS

|         |          |
|---------|----------|
| DESIGN: | NAT      |
| DRAWN:  | ATD      |
| CHECK:  | JPU      |
| JOB NO: | 20084.20 |
| DATE:   | 09/05/23 |

WILLIAMS INVESTMENTS COMMERCIAL PARK  
 ARLINGTON BINDING SITE PLAN  
 16430 51ST AVE NE  
 ARLINGTON, WA 98223

GRADING  
 AND DRAINAGE DETAILS - BLOCK A

SHEET:  
**C3.5A**

# **BMP C101: Preserving Natural Vegetation**

## ***Purpose***

The purpose of preserving natural vegetation is to reduce erosion wherever practicable. Limiting site disturbance is the single most effective method for reducing erosion. For example, conifers can hold up to about 50 percent of all rain that falls during a storm. Up to 20-30 percent of this rain may never reach the ground but is taken up by the tree or evaporates. Another benefit is that the rain held in the tree can be released slowly to the ground after the storm.

## ***Conditions of Use***

Natural vegetation should be preserved on steep slopes, near perennial and intermittent water-courses or swales, and on building sites in wooded areas.

- As required by local governments.
- Phase construction to preserve natural vegetation on the project site for as long as possible during the construction period.

## ***Design and Installation Specifications***

Natural vegetation can be preserved in natural clumps or as individual trees, shrubs and vines.

The preservation of individual plants is more difficult because heavy equipment is generally used to remove unwanted vegetation. The points to remember when attempting to save individual plants are:

- Is the plant worth saving? Consider the location, species, size, age, vigor, and the work involved. Local governments may also have ordinances to save natural vegetation and trees.
- Fence or clearly mark areas around trees that are to be saved. It is preferable to keep ground disturbance away from the trees at least as far out as the dripline.

Plants need protection from three kinds of injuries:

- *Construction Equipment* - This injury can be above or below the ground level. Damage results from scarring, cutting of roots, and compaction of the soil. Placing a fenced buffer zone around plants to be saved prior to construction can prevent construction equipment injuries.
- *Grade Changes* - Changing the natural ground level will alter grades, which affects the plant's ability to obtain the necessary air, water, and minerals. Minor fills usually do not cause problems although sensitivity between species does vary and should be checked. Trees can typically tolerate fill of 6 inches or less. For shrubs and other plants, the fill should be less.

When there are major changes in grade, it may become necessary to supply air to the roots of plants. This can be done by placing a layer of gravel and a tile system over the roots before the fill is made. The tile system should be laid out on the original grade leading from a dry well

around the tree trunk. The system should then be covered with small stones to allow air to circulate over the root area.

Lowering the natural ground level can seriously damage trees and shrubs. The highest percentage of the plant roots are in the upper 12 inches of the soil and cuts of only 2-3 inches can cause serious injury. To protect the roots it may be necessary to terrace the immediate area around the plants to be saved. If roots are exposed, construction of retaining walls may be needed to keep the soil in place. Plants can also be preserved by leaving them on an undisturbed, gently sloping mound. To increase the chances for survival, it is best to limit grade changes and other soil disturbances to areas outside the dripline of the plant.

- *Excavations* - Protect trees and other plants when excavating for drainfields, power, water, and sewer lines. Where possible, the trenches should be routed around trees and large shrubs. When this is not possible, it is best to tunnel under them. This can be done with hand tools or with power augers. If it is not possible to route the trench around plants to be saved, then the following should be observed:
  - Cut as few roots as possible. When you have to cut, cut clean. Paint cut root ends with a wood dressing like asphalt base paint if roots will be exposed for more than 24-hours.
  - Backfill the trench as soon as possible.
  - Tunnel beneath root systems as close to the center of the main trunk to preserve most of the important feeder roots.

Some problems that can be encountered with a few specific trees are:

- Maple, Dogwood, Red alder, Western hemlock, Western red cedar, and Douglas fir do not readily adjust to changes in environment and special care should be taken to protect these trees.
- The windthrow hazard of Pacific silver fir and madrona is high, while that of Western hemlock is moderate. The danger of windthrow increases where dense stands have been thinned. Other species (unless they are on shallow, wet soils less than 20 inches deep) have a low windthrow hazard.
- Cottonwoods, maples, and willows have water-seeking roots. These can cause trouble in sewer lines and infiltration fields. On the other hand, they thrive in high moisture conditions that other trees would not.
- Thinning operations in pure or mixed stands of Grand fir, Pacific silver fir, Noble fir, Sitka spruce, Western red cedar, Western hemlock, Pacific dogwood, and Red alder can cause serious disease problems. Disease can become established through damaged limbs, trunks, roots, and freshly cut stumps. Diseased and weakened trees are also susceptible to insect attack.

## ***Maintenance Standards***

Inspect flagged and/or fenced areas regularly to make sure flagging or fencing has not been removed or damaged. If the flagging or fencing has been damaged or visibility reduced, it shall be repaired or replaced immediately and visibility restored.

If tree roots have been exposed or injured, “prune” cleanly with an appropriate pruning saw or loppers directly above the damaged roots and recover with native soils. Treatment of sap flowing trees (fir, hemlock, pine, soft maples) is not advised as sap forms a natural healing barrier.

## **BMP C102: Buffer Zones**

### ***Purpose***

Creation of an undisturbed area or strip of natural vegetation or an established suitable planting that will provide a living filter to reduce soil erosion and stormwater runoff velocities.

### ***Conditions of Use***

Buffer zones are used along streams, wetlands and other bodies of water that need protection from erosion and sedimentation. Contractors can use vegetative buffer zone BMPs to protect natural swales and they can incorporate them into the natural landscaping of an area.

Do not use critical-areas buffer zones as sediment treatment areas. These areas shall remain completely undisturbed. The local permitting authority may expand the buffer widths temporarily to allow the use of the expanded area for removal of sediment.

The types of buffer zones can change the level of protection required as shown below:

Designated Critical Area Buffers - buffers that protect Critical Areas, as defined by the Washington State Growth Management Act, and are established and managed by the local permitting authority. These should not be disturbed and must be protected with sediment control BMPs to prevent impacts. The local permitting authority may expand the buffer widths temporarily to allow the use of the expanded area for removal of sediment.

Vegetative Buffer Zones - areas that may be identified in undisturbed vegetation areas or managed vegetation areas that are outside any Designated Critical Area Buffer. They may be utilized to provide an additional sediment control area and/or reduce runoff velocities. If being used for preservation of natural vegetation, they should be arranged in clumps or strips. They can be used to protect natural swales and incorporated into the natural landscaping area.

### ***Design and Installation Specifications***

- Preserving natural vegetation or plantings in clumps, blocks, or strips is generally the easiest and most successful method.
- Leave all unstable steep slopes in natural vegetation.
- Mark clearing limits and keep all equipment and construction debris out of the natural areas and buffer zones. Steel construction fencing is the most effective method to protect sensitive areas and buffers. Alternatively, wire-backed silt fence on steel posts is marginally effective. Flagging alone is typically not effective.
- Keep all excavations outside the dripline of trees and shrubs.
- Do not push debris or extra soil into the buffer zone area because it will cause damage by

**Table V-A.1: Maintenance Standards - Detention Ponds (continued)**

| Maintenance Component                                       | Defect                      | Conditions When Maintenance Is Needed  | Results Expected When Maintenance Is Performed   |
|---|-----------------------------|--|--|
|   | Liner (if Applicable)       | Liner is visible and has more than three 1/4-inch holes in it.   | Liner repaired or replaced. Liner is fully covered.  |
| Ponds Berms (Dikes)   | Settlements                 | Any part of berm which has settled 4 inches lower than the design elevation<br>If settlement is apparent, measure berm to determine amount of settlement<br>Settling can be an indication of more severe problems with the berm or outlet works. A licensed engineer in the state of Washington should be consulted to determine the source of the settlement. | Dike is built back to the design elevation.  |
|   | Piping                      | Discernable water flow through pond berm. Ongoing erosion with potential for erosion to continue.<br>(Recommend a Geotechnical engineer be called in to inspect and evaluate condition and recommend repair of condition.)   | Piping eliminated. Erosion potential resolved.   |
| Emergency Overflow/Spillway and Berms over 4 feet in height | Tree Growth                 | Tree growth on emergency spillways creates blockage problems and may cause failure of the berm due to uncontrolled overtopping.<br>Tree growth on berms over 4 feet in height may lead to piping through the berm which could lead to failure of the berm.   | Trees should be removed. If root system is small (base less than 4 inches) the root system may be left in place. Otherwise the roots should be removed and the berm restored. A licensed engineer in the state of Washington should be consulted for proper berm/spillway restoration. |
|   | Piping                      | Discernable water flow through pond berm. Ongoing erosion with potential for erosion to continue.<br>(Recommend a Geotechnical engineer be called in to inspect and evaluate condition and recommend repair of condition.)   | Piping eliminated. Erosion potential resolved.   |
| Emergency Overflow/Spillway                                 | Emergency Overflow/Spillway | Only one layer of rock exists above native soil in area five square feet or larger, or any exposure of native soil at the top of out flow path of spillway.<br>(Rip-rap on inside slopes need not be replaced.)  | Rocks and pad depth are restored to design standards.  |
|   | Erosion                     | See "Side Slopes of Pond"  |  |

**Table V-A.2: Maintenance Standards - Infiltration**

| Maintenance Component | Defect                       | Conditions When Maintenance Is Needed  | Results Expected When Maintenance Is Performed  |
|-----------------------|------------------------------|--|---|
| General               | Trash & Debris               | See <a href="#">Table V-A.1: Maintenance Standards - Detention Ponds</a>   | See <a href="#">Table V-A.1: Maintenance Standards - Detention Ponds</a>                              |
|                       | Poisonous/Noxious Vegetation | See <a href="#">Table V-A.1: Maintenance Standards - Detention Ponds</a>   | See <a href="#">Table V-A.1: Maintenance Standards - Detention Ponds</a>                              |
|                       | Contaminants and Pollution   | See <a href="#">Table V-A.1: Maintenance Standards - Detention Ponds</a>   | See <a href="#">Table V-A.1: Maintenance Standards - Detention Ponds</a>                              |
|                       | Rodent Holes                 | See <a href="#">Table V-A.1: Maintenance Standards - Detention Ponds</a>   | See <a href="#">Table V-A.1: Maintenance Standards - Detention Ponds</a>                              |
| Storage Area          | Sediment                     | Water ponding in infiltration pond after rainfall ceases and appropriate time allowed for infiltration. Treatment basins should infiltrate Water Quality Design Storm Volume within 48 hours, and empty within 24 hours after cessation of most rain events. | Sediment is removed and/or facility is cleaned so that infiltration system works according to design. |

**Table V-A.2: Maintenance Standards - Infiltration (continued)**

| Maintenance Component  | Defect  | Conditions When Maintenance Is Needed  | Results Expected When Maintenance Is Performed                           |
|--|---|--|--|
|  |   | (A percolation test pit or test of facility indicates facility is only working at 90% of its designed capabilities. Test every 2 to 5 years. If two inches or more sediment is present, remove). |  |
| Filter Bags (if applicable)                                  | Filled with Sediment and Debris                     | Sediment and debris fill bag more than 1/2 full.   | Filter bag is replaced or system is redesigned.                          |
| Rock Filters   | Sediment and Debris                                 | By visual inspection, little or no water flows through filter during heavy rain storms.  | Gravel in rock filter is replaced.                                       |
| Side Slopes of Pond  | Erosion   | See <a href="#">Table V-A.1: Maintenance Standards - Detention Ponds</a>   | See <a href="#">Table V-A.1: Maintenance Standards - Detention Ponds</a> |
| Emergency Overflow Spillway and Berms over 4 feet in height. | Tree Growth   | See <a href="#">Table V-A.1: Maintenance Standards - Detention Ponds</a>   | See <a href="#">Table V-A.1: Maintenance Standards - Detention Ponds</a> |
|  | Piping  | See <a href="#">Table V-A.1: Maintenance Standards - Detention Ponds</a>   | See <a href="#">Table V-A.1: Maintenance Standards - Detention Ponds</a> |
| Emergency Overflow Spillway                                  | Rock Missing  | See <a href="#">Table V-A.1: Maintenance Standards - Detention Ponds</a>   | See <a href="#">Table V-A.1: Maintenance Standards - Detention Ponds</a> |
|  | Erosion   | See <a href="#">Table V-A.1: Maintenance Standards - Detention Ponds</a>   | See <a href="#">Table V-A.1: Maintenance Standards - Detention Ponds</a> |
| Pre-settling Ponds and Vaults                                | Facility or sump filled with Sediment and/or debris | 6" or designed sediment trap depth of sediment.  | Sediment is removed.   |

**Table V-A.3: Maintenance Standards - Closed Detention Systems (Tanks/Vaults)**

| Maintenance Component | Defect   | Conditions When Maintenance is Needed   | Results Expected When Maintenance is Performed   |
|-----------------------|--|---|--|
| Storage Area          | Plugged Air Vents  | One-half of the cross section of a vent is blocked at any point or the vent is damaged.   | Vents open and functioning.  |
|                       | Debris and Sediment  | Accumulated sediment depth exceeds 10% of the diameter of the storage area for 1/2 length of storage vault or any point depth exceeds 15% of diameter.<br>(Example: 72-inch storage tank would require cleaning when sediment reaches depth of 7 inches for more than 1/2 length of tank.)  | All sediment and debris removed from storage area.   |
|                       | Joints Between Tank/Pipe Section   | Any openings or voids allowing material to be transported into facility.<br>(Will require engineering analysis to determine structural stability).  | All joint between tank/pipe sections are sealed.   |
|                       | Tank Pipe Bent Out of Shape  | Any part of tank/pipe is bent out of shape more than 10% of its design shape. (Review required by engineer to determine structural stability).  | Tank/pipe repaired or replaced to design.  |
|                       | Vault Structure Includes Cracks in Wall, Bottom, Damage to Frame and/or Top Slab | Cracks wider than 1/2-inch and any evidence of soil particles entering the structure through the cracks, or maintenance/inspection personnel determines that the vault is not structurally sound.<br>Cracks wider than 1/2-inch at the joint of any inlet/outlet pipe or any evidence of soil particles entering the vault through the walls. | Vault replaced or repaired to design specifications and is structurally sound.<br>No cracks more than 1/4-inch wide at the joint of the inlet/outlet pipe. |

**Table V-A.5: Maintenance Standards - Catch Basins**

| Maintenance Component        | Defect                                     | Conditions When Maintenance is Needed   | Results Expected When Maintenance is performed  |
|------------------------------|--|---|---|
| General                      | Trash & Debris                             | Trash or debris which is located immediately in front of the catch basin opening or is blocking inletting capacity of the basin by more than 10%.<br>Trash or debris (in the basin) that exceeds 60 percent of the sump depth as measured from the bottom of basin to invert of the lowest pipe into or out of the basin, but in no case less than a minimum of six inches clearance from the debris surface to the invert of the lowest pipe.<br>Trash or debris in any inlet or outlet pipe blocking more than 1/3 of its height.<br>Dead animals or vegetation that could generate odors that could cause complaints or dangerous gases (e.g., methane). | No Trash or debris located immediately in front of catch basin or on grate opening.<br>No trash or debris in the catch basin.<br>Inlet and outlet pipes free of trash or debris.<br>No dead animals or vegetation present within the catch basin. |
|                              | Sediment                                   | Sediment (in the basin) that exceeds 60 percent of the sump depth as measured from the bottom of basin to invert of the lowest pipe into or out of the basin, but in no case less than a minimum of 6 inches clearance from the sediment surface to the invert of the lowest pipe.  | No sediment in the catch basin  |
|                              | Structure Damage to Frame and/or Top Slab  | Top slab has holes larger than 2 square inches or cracks wider than 1/4 inch. (Intent is to make sure no material is running into basin).<br>Frame not sitting flush on top slab, i.e., separation of more than 3/4 inch of the frame from the top slab. Frame not securely attached  | Top slab is free of holes and cracks.<br>Frame is sitting flush on the riser rings or top slab and firmly attached.   |
|                              | Fractures or Cracks in Basin Walls/ Bottom | Maintenance person judges that structure is unsound.<br>Grout fillet has separated or cracked wider than 1/2 inch and longer than 1 foot at the joint of any inlet/outlet pipe or any evidence of soil particles entering catch basin through cracks.   | Basin replaced or repaired to design standards.<br>Pipe is regouted and secure at basin wall.   |
|                              | Settlement/ Mis-alignment                  | If failure of basin has created a safety, function, or design problem.  | Basin replaced or repaired to design standards.   |
|                              | Vegetation                                 | Vegetation growing across and blocking more than 10% of the basin opening.<br>Vegetation growing in inlet/outlet pipe joints that is more than six inches tall and less than six inches apart.  | No vegetation blocking opening to basin.<br>No vegetation or root growth present.   |
|                              | Contamination and Pollution                | See <a href="#">Table V-A.1: Maintenance Standards - Detention Ponds</a>  | No pollution present.   |
| Catch Basin Cover            | Cover Not in Place                         | Cover is missing or only partially in place. Any open catch basin requires maintenance.   | Cover/grate is in place, meets design standards, and is secured   |
|                              | Locking Mechanism Not Working              | Mechanism cannot be opened by one maintenance person with proper tools. Bolts into frame have less than 1/2 inch of thread.   | Mechanism opens with proper tools.  |
|                              | Cover Difficult to Remove                  | One maintenance person cannot remove lid after applying normal lifting pressure.<br>(Intent is keep cover from sealing off access to maintenance.)  | Cover can be removed by one maintenance person.   |
| Ladder                       | Ladder Rungs Unsafe                        | Ladder is unsafe due to missing rungs, not securely attached to basin wall, misalignment, rust, cracks, or sharp edges.   | Ladder meets design standards and allows maintenance person safe access.  |
| Metal Grates (If Applicable) | Grate opening Unsafe                       | Grate with opening wider than 7/8 inch.   | Grate opening meets design standards.   |
|                              | Trash and Debris                           | Trash and debris that is blocking more than 20% of grate surface inletting capacity.  | Grate free of trash and debris.   |
|                              | Damaged or Missing.                        | Grate missing or broken member(s) of the grate.   | Grate is in place, meets the design standards, and is installed and aligned with the flow path.   |



## Appendix A – WWHM Reports

### Appendix A Summary

*WWHM Project Report – Temporary Sediment Pond*

*WWHM Project Report – Flow Control/Infiltration Sizing*

*WWHM Project Report – Water Quality – To be sized in future phases. Not included.*

*Pump Sizing Calculations - To be sized in future phases. Not included.*

### **WWHM2012 PROJECT REPORT**

---

**Project Name:** BLOCK A Flow Control Sediment Pond

**Site Name:** The Rex Building A+B

**Site Address:**

**City** : Arlington

**Report Date:** 8/31/2023

**Gage** : Everett

**Data Start** : 1948/10/01

**Data End** : 2009/09/30

**Precip Scale:** 1.20

**Version Date:** 2021/08/18

**Version** : 4.2.18

---

**Low Flow Threshold for POC 1** : 50 Percent of the 2 Year

---

**High Flow Threshold for POC 1:** 50 year

---

#### **PREDEVELOPED LAND USE**

**Name** : Basin 1

**Bypass:** No

**GroundWater:** No

|                          |             |
|--------------------------|-------------|
| <u>Pervious Land Use</u> | <u>acre</u> |
| A B, Forest, Flat        | 8.2         |

|                |     |
|----------------|-----|
| Pervious Total | 8.2 |
|----------------|-----|

|                            |             |
|----------------------------|-------------|
| <u>Impervious Land Use</u> | <u>acre</u> |
|----------------------------|-------------|

|                  |   |
|------------------|---|
| Impervious Total | 0 |
|------------------|---|

|             |     |
|-------------|-----|
| Basin Total | 8.2 |
|-------------|-----|



Element Flows To:  
Surface                                      Interflow                                      Groundwater

---

**MITIGATED LAND USE**

Name : Basin 1  
Bypass: No

GroundWater: No

| <u>Pervious Land Use</u> | <u>acre</u> |
|--------------------------|-------------|
| A B, Lawn, Flat          | 1.21        |

Pervious Total                                      1.21

| <u>Impervious Land Use</u> | <u>acre</u> |
|----------------------------|-------------|
| ROADS FLAT                 | 3.44        |
| ROOF TOPS FLAT             | 3.04        |
| SIDEWALKS FLAT             | 0.51        |

Impervious Total                                      6.99

Basin Total    8.2

---

Element Flows To:  
Surface                                      Interflow                                      Groundwater

---

**ANALYSIS RESULTS**

**Stream Protection Duration**

---

Predeveloped Landuse Totals for POC #1  
Total Pervious Area:8.2  
Total Impervious Area:0

---

Mitigated Landuse Totals for POC #1  
Total Pervious Area:1.21  
Total Impervious Area:6.99

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Flow Frequency Return Periods for Predeveloped. POC #1  
Return Period                                      Flow(cfs)  
2 year    0.009411

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|          |          |
|----------|----------|
| 5 year   | 0.020413 |
| 10 year  | 0.032745 |
| 25 year  | 0.057189 |
| 50 year  | 0.084508 |
| 100 year | 0.122583 |

**Flow Frequency Return Periods for Mitigated. POC #1**

| <b>Return Period</b> | <b>Flow(cfs)</b> |
|----------------------|------------------|
| <b>2 year</b>        | <b>3.743399</b>  |
| 5 year               | 5.055107         |
| 10 year              | 6.012892         |
| 25 year              | 7.328645         |
| 50 year              | 8.388104         |
| 100 year             | 9.517794         |

**WWHM2012  
PROJECT REPORT**

**Project Name:** BLOCK A Infil Trench  
**Site Name:** The Rex Onsite Areas  
**Site Address:**  
**City** : Arlington  
**Report Date:** 8/31/2023  
**Gage** : Everett  
**Data Start** : 1948/10/01  
**Data End** : 2009/09/30  
**Precip Scale:** 1.20  
**Version Date:** 2021/08/18  
**Version** : 4.2.18

**Low Flow Threshold for POC 1** : 50 Percent of the 2 Year

**High Flow Threshold for POC 1:** 50 year

**PREDEVELOPED LAND USE**

**Name** : Basin 1  
**Bypass:** No

**GroundWater:** No

| <b><u>Pervious Land Use</u></b> | <b><u>acre</u></b> |
|---------------------------------|--------------------|
| A B, Forest, Flat               | 8.2                |
| <b>Pervious Total</b>           | <b>8.2</b>         |



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| <u>Impervious Land Use</u> | <u>acre</u> |
|----------------------------|-------------|
| Impervious Total           | 0           |
| Basin Total                | 8.2         |

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Element Flows To:  
Surface                                      Interflow                                      Groundwater

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**MITIGATED LAND USE**

Name : Basin 1  
Bypass: No

GroundWater: No

| <u>Pervious Land Use</u> | <u>acre</u> |
|--------------------------|-------------|
| A B, Lawn, Flat          | 1.21        |

Pervious Total                                      1.21

| <u>Impervious Land Use</u> | <u>acre</u> |
|----------------------------|-------------|
| ROADS FLAT                 | 3.44        |
| ROOF TOPS FLAT             | 3.04        |
| SIDEWALKS FLAT             | 0.51        |

Impervious Total                                      6.99

Basin Total    8.2

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Element Flows To:  
Surface                                      Interflow                                      Groundwater  
Gravel Trench Bed 1      Gravel Trench Bed 1

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Name : Gravel Trench Bed 1  
Bottom Length: 2660.00 ft.  
Bottom Width: 20.00 ft.  
Trench bottom slope 1: 0 To 1  
Trench left side slope 0: 0 To 1  
Trench right side slope 2: 0 To 1  
Material thickness of first layer: 3  
Pour Space of material for first layer: 0.3  
Material thickness of second layer: 0



Pour Space of material for second layer: 0  
 Material thickness of third layer: 0  
 Pour Space of material for third layer: 0  
 Infiltration On  
 Infiltration rate: 0.75  
 Infiltration safety factor: 1  
 Total Volume Infiltrated (ac-ft.): 1355.41  
 Total Volume Through Riser (ac-ft.): 0.033  
 Total Volume Through Facility (ac-ft.): 1355.444  
**Percent Infiltrated: 100**  
 Total Precip Applied to Facility: 0  
 Total Evap From Facility: 0  
Discharge Structure  
 Riser Height: 2.95 ft.  
 Riser Diameter: 12 in.

Element Flows To:  
 Outlet 1                      Outlet 2

**Gravel Trench Bed Hydraulic Table**

| Stage(feet) | Area(ac.) | Volume(ac-ft.) | Discharge(cfs) | Infilt(cfs) |
|-------------|-----------|----------------|----------------|-------------|
| 0.0000      | 1.221     | 0.000          | 0.000          | 0.000       |
| 0.0333      | 1.221     | 0.012          | 0.000          | 0.923       |
| 0.0667      | 1.221     | 0.024          | 0.000          | 0.923       |
| 0.1000      | 1.221     | 0.036          | 0.000          | 0.923       |
| 0.1333      | 1.221     | 0.048          | 0.000          | 0.923       |
| 0.1667      | 1.221     | 0.061          | 0.000          | 0.923       |
| 0.2000      | 1.221     | 0.073          | 0.000          | 0.923       |
| 0.2333      | 1.221     | 0.085          | 0.000          | 0.923       |
| 0.2667      | 1.221     | 0.097          | 0.000          | 0.923       |
| 0.3000      | 1.221     | 0.109          | 0.000          | 0.923       |
| 0.3333      | 1.221     | 0.122          | 0.000          | 0.923       |
| 0.3667      | 1.221     | 0.134          | 0.000          | 0.923       |
| 0.4000      | 1.221     | 0.146          | 0.000          | 0.923       |
| 0.4333      | 1.221     | 0.158          | 0.000          | 0.923       |
| 0.4667      | 1.221     | 0.171          | 0.000          | 0.923       |
| 0.5000      | 1.221     | 0.183          | 0.000          | 0.923       |
| 0.5333      | 1.221     | 0.195          | 0.000          | 0.923       |
| 0.5667      | 1.221     | 0.207          | 0.000          | 0.923       |
| 0.6000      | 1.221     | 0.219          | 0.000          | 0.923       |
| 0.6333      | 1.221     | 0.232          | 0.000          | 0.923       |
| 0.6667      | 1.221     | 0.244          | 0.000          | 0.923       |
| 0.7000      | 1.221     | 0.256          | 0.000          | 0.923       |
| 0.7333      | 1.221     | 0.268          | 0.000          | 0.923       |
| 0.7667      | 1.221     | 0.280          | 0.000          | 0.923       |
| 0.8000      | 1.221     | 0.293          | 0.000          | 0.923       |
| 0.8333      | 1.221     | 0.305          | 0.000          | 0.923       |
| 0.8667      | 1.221     | 0.317          | 0.000          | 0.923       |
| 0.9000      | 1.221     | 0.329          | 0.000          | 0.923       |
| 0.9333      | 1.221     | 0.342          | 0.000          | 0.923       |
| 0.9667      | 1.221     | 0.354          | 0.000          | 0.923       |
| 1.0000      | 1.221     | 0.366          | 0.000          | 0.923       |



|        |       |       |       |       |
|--------|-------|-------|-------|-------|
| 1.0333 | 1.221 | 0.378 | 0.000 | 0.923 |
| 1.0667 | 1.221 | 0.390 | 0.000 | 0.923 |
| 1.1000 | 1.221 | 0.403 | 0.000 | 0.923 |
| 1.1333 | 1.221 | 0.415 | 0.000 | 0.923 |
| 1.1667 | 1.221 | 0.427 | 0.000 | 0.923 |
| 1.2000 | 1.221 | 0.439 | 0.000 | 0.923 |
| 1.2333 | 1.221 | 0.451 | 0.000 | 0.923 |
| 1.2667 | 1.221 | 0.464 | 0.000 | 0.923 |
| 1.3000 | 1.221 | 0.476 | 0.000 | 0.923 |
| 1.3333 | 1.221 | 0.488 | 0.000 | 0.923 |
| 1.3667 | 1.221 | 0.500 | 0.000 | 0.923 |
| 1.4000 | 1.221 | 0.512 | 0.000 | 0.923 |
| 1.4333 | 1.221 | 0.525 | 0.000 | 0.923 |
| 1.4667 | 1.221 | 0.537 | 0.000 | 0.923 |
| 1.5000 | 1.221 | 0.549 | 0.000 | 0.923 |
| 1.5333 | 1.221 | 0.561 | 0.000 | 0.923 |
| 1.5667 | 1.221 | 0.574 | 0.000 | 0.923 |
| 1.6000 | 1.221 | 0.586 | 0.000 | 0.923 |
| 1.6333 | 1.221 | 0.598 | 0.000 | 0.923 |
| 1.6667 | 1.221 | 0.610 | 0.000 | 0.923 |
| 1.7000 | 1.221 | 0.622 | 0.000 | 0.923 |
| 1.7333 | 1.221 | 0.635 | 0.000 | 0.923 |
| 1.7667 | 1.221 | 0.647 | 0.000 | 0.923 |
| 1.8000 | 1.221 | 0.659 | 0.000 | 0.923 |
| 1.8333 | 1.221 | 0.671 | 0.000 | 0.923 |
| 1.8667 | 1.221 | 0.683 | 0.000 | 0.923 |
| 1.9000 | 1.221 | 0.696 | 0.000 | 0.923 |
| 1.9333 | 1.221 | 0.708 | 0.000 | 0.923 |
| 1.9667 | 1.221 | 0.720 | 0.000 | 0.923 |
| 2.0000 | 1.221 | 0.732 | 0.000 | 0.923 |
| 2.0333 | 1.221 | 0.745 | 0.000 | 0.923 |
| 2.0667 | 1.221 | 0.757 | 0.000 | 0.923 |
| 2.1000 | 1.221 | 0.769 | 0.000 | 0.923 |
| 2.1333 | 1.221 | 0.781 | 0.000 | 0.923 |
| 2.1667 | 1.221 | 0.793 | 0.000 | 0.923 |
| 2.2000 | 1.221 | 0.806 | 0.000 | 0.923 |
| 2.2333 | 1.221 | 0.818 | 0.000 | 0.923 |
| 2.2667 | 1.221 | 0.830 | 0.000 | 0.923 |
| 2.3000 | 1.221 | 0.842 | 0.000 | 0.923 |
| 2.3333 | 1.221 | 0.854 | 0.000 | 0.923 |
| 2.3667 | 1.221 | 0.867 | 0.000 | 0.923 |
| 2.4000 | 1.221 | 0.879 | 0.000 | 0.923 |
| 2.4333 | 1.221 | 0.891 | 0.000 | 0.923 |
| 2.4667 | 1.221 | 0.903 | 0.000 | 0.923 |
| 2.5000 | 1.221 | 0.916 | 0.000 | 0.923 |
| 2.5333 | 1.221 | 0.928 | 0.000 | 0.923 |
| 2.5667 | 1.221 | 0.940 | 0.000 | 0.923 |
| 2.6000 | 1.221 | 0.952 | 0.000 | 0.923 |
| 2.6333 | 1.221 | 0.964 | 0.000 | 0.923 |
| 2.6667 | 1.221 | 0.977 | 0.000 | 0.923 |
| 2.7000 | 1.221 | 0.989 | 0.000 | 0.923 |
| 2.7333 | 1.221 | 1.001 | 0.000 | 0.923 |
| 2.7667 | 1.221 | 1.013 | 0.000 | 0.923 |
| 2.8000 | 1.221 | 1.025 | 0.000 | 0.923 |
| 2.8333 | 1.221 | 1.038 | 0.000 | 0.923 |



|        |       |       |       |       |
|--------|-------|-------|-------|-------|
| 2.8667 | 1.221 | 1.050 | 0.000 | 0.923 |
| 2.9000 | 1.221 | 1.062 | 0.000 | 0.923 |
| 2.9333 | 1.221 | 1.074 | 0.000 | 0.923 |
| 2.9667 | 1.221 | 1.087 | 0.022 | 0.923 |
| 3.0000 | 1.221 | 1.099 | 0.118 | 0.923 |

**ANALYSIS RESULTS**

**Stream Protection Duration**

Predeveloped Landuse Totals for POC #1  
 Total Pervious Area:8.2  
 Total Impervious Area:0

Mitigated Landuse Totals for POC #1  
 Total Pervious Area:1.21  
 Total Impervious Area:6.99

**Flow Frequency Return Periods for Predeveloped. POC #1**

| <u>Return Period</u> | <u>Flow(cfs)</u> |
|----------------------|------------------|
| 2 year               | 0.009411         |
| 5 year               | 0.020413         |
| 10 year              | 0.032745         |
| 25 year              | 0.057189         |
| 50 year              | 0.084508         |
| 100 year             | 0.122583         |

**Flow Frequency Return Periods for Mitigated. POC #1**

| <u>Return Period</u> | <u>Flow(cfs)</u> |
|----------------------|------------------|
| 2 year               | 0                |
| 5 year               | 0                |
| 10 year              | 0                |
| 25 year              | 0                |
| 50 year              | 0                |
| 100 year             | 0                |

**Stream Protection Duration**

**Annual Peaks for Predeveloped and Mitigated. POC #1**

| <u>Year</u> | <u>Predeveloped</u> | <u>Mitigated</u> |
|-------------|---------------------|------------------|
| 1949        | 0.006               | 0.000            |
| 1950        | 0.019               | 0.000            |
| 1951        | 0.014               | 0.000            |
| 1952        | 0.006               | 0.000            |
| 1953        | 0.007               | 0.000            |
| 1954        | 0.045               | 0.000            |
| 1955        | 0.034               | 0.000            |
| 1956        | 0.007               | 0.000            |



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|      |       |       |
|------|-------|-------|
| 1957 | 0.007 | 0.000 |
| 1958 | 0.007 | 0.000 |
| 1959 | 0.015 | 0.000 |
| 1960 | 0.012 | 0.000 |
| 1961 | 0.031 | 0.000 |
| 1962 | 0.007 | 0.000 |
| 1963 | 0.007 | 0.000 |
| 1964 | 0.021 | 0.000 |
| 1965 | 0.006 | 0.000 |
| 1966 | 0.007 | 0.000 |
| 1967 | 0.013 | 0.000 |
| 1968 | 0.007 | 0.000 |
| 1969 | 0.007 | 0.000 |
| 1970 | 0.007 | 0.000 |
| 1971 | 0.032 | 0.000 |
| 1972 | 0.006 | 0.000 |
| 1973 | 0.006 | 0.000 |
| 1974 | 0.017 | 0.000 |
| 1975 | 0.006 | 0.000 |
| 1976 | 0.015 | 0.000 |
| 1977 | 0.007 | 0.000 |
| 1978 | 0.007 | 0.000 |
| 1979 | 0.013 | 0.000 |
| 1980 | 0.007 | 0.000 |
| 1981 | 0.007 | 0.000 |
| 1982 | 0.010 | 0.000 |
| 1983 | 0.007 | 0.000 |
| 1984 | 0.007 | 0.000 |
| 1985 | 0.011 | 0.000 |
| 1986 | 0.058 | 0.000 |
| 1987 | 0.038 | 0.000 |
| 1988 | 0.007 | 0.000 |
| 1989 | 0.006 | 0.000 |
| 1990 | 0.007 | 0.000 |
| 1991 | 0.007 | 0.000 |
| 1992 | 0.007 | 0.000 |
| 1993 | 0.007 | 0.000 |
| 1994 | 0.006 | 0.000 |
| 1995 | 0.008 | 0.000 |
| 1996 | 0.074 | 0.000 |
| 1997 | 0.203 | 0.000 |
| 1998 | 0.007 | 0.000 |
| 1999 | 0.006 | 0.000 |
| 2000 | 0.012 | 0.000 |
| 2001 | 0.006 | 0.000 |
| 2002 | 0.007 | 0.000 |
| 2003 | 0.005 | 0.000 |
| 2004 | 0.006 | 0.000 |
| 2005 | 0.007 | 0.000 |
| 2006 | 0.218 | 0.000 |
| 2007 | 0.006 | 0.000 |
| 2008 | 0.010 | 0.186 |
| 2009 | 0.006 | 0.000 |

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**Stream Protection Duration**

**Ranked Annual Peaks for Predeveloped and Mitigated. POC #1**

| <b>Rank</b> | <b>Predeveloped</b> | <b>Mitigated</b> |
|-------------|---------------------|------------------|
| 1           | 0.2184              | 0.1858           |
| 2           | 0.2030              | 0.0000           |
| 3           | 0.0741              | 0.0000           |
| 4           | 0.0577              | 0.0000           |
| 5           | 0.0451              | 0.0000           |
| 6           | 0.0378              | 0.0000           |
| 7           | 0.0342              | 0.0000           |
| 8           | 0.0319              | 0.0000           |
| 9           | 0.0309              | 0.0000           |
| 10          | 0.0214              | 0.0000           |
| 11          | 0.0192              | 0.0000           |
| 12          | 0.0172              | 0.0000           |
| 13          | 0.0149              | 0.0000           |
| 14          | 0.0147              | 0.0000           |
| 15          | 0.0137              | 0.0000           |
| 16          | 0.0131              | 0.0000           |
| 17          | 0.0128              | 0.0000           |
| 18          | 0.0122              | 0.0000           |
| 19          | 0.0120              | 0.0000           |
| 20          | 0.0110              | 0.0000           |
| 21          | 0.0099              | 0.0000           |
| 22          | 0.0097              | 0.0000           |
| 23          | 0.0078              | 0.0000           |
| 24          | 0.0066              | 0.0000           |
| 25          | 0.0066              | 0.0000           |
| 26          | 0.0066              | 0.0000           |
| 27          | 0.0066              | 0.0000           |
| 28          | 0.0066              | 0.0000           |
| 29          | 0.0066              | 0.0000           |
| 30          | 0.0066              | 0.0000           |
| 31          | 0.0066              | 0.0000           |
| 32          | 0.0066              | 0.0000           |
| 33          | 0.0066              | 0.0000           |
| 34          | 0.0066              | 0.0000           |
| 35          | 0.0066              | 0.0000           |
| 36          | 0.0066              | 0.0000           |
| 37          | 0.0066              | 0.0000           |
| 38          | 0.0065              | 0.0000           |
| 39          | 0.0065              | 0.0000           |
| 40          | 0.0065              | 0.0000           |
| 41          | 0.0065              | 0.0000           |
| 42          | 0.0065              | 0.0000           |
| 43          | 0.0065              | 0.0000           |
| 44          | 0.0065              | 0.0000           |
| 45          | 0.0065              | 0.0000           |
| 46          | 0.0065              | 0.0000           |
| 47          | 0.0065              | 0.0000           |
| 48          | 0.0065              | 0.0000           |
| 49          | 0.0065              | 0.0000           |
| 50          | 0.0065              | 0.0000           |
| 51          | 0.0065              | 0.0000           |
| 52          | 0.0065              | 0.0000           |



|    |        |        |
|----|--------|--------|
| 53 | 0.0064 | 0.0000 |
| 54 | 0.0064 | 0.0000 |
| 55 | 0.0064 | 0.0000 |
| 56 | 0.0064 | 0.0000 |
| 57 | 0.0063 | 0.0000 |
| 58 | 0.0063 | 0.0000 |
| 59 | 0.0061 | 0.0000 |
| 60 | 0.0057 | 0.0000 |
| 61 | 0.0046 | 0.0000 |

**Stream Protection Duration**

**POC #1**

**The Facility FAILED**

**Facility FAILED duration standard for 1+ flows.**

| <b>Flow(cfs)</b> | <b>Predev</b> | <b>Mit</b> | <b>Percentage</b> | <b>Pass/Fail</b> |
|------------------|---------------|------------|-------------------|------------------|
| 0.0047           | 2357          | 15         | 0                 | Pass             |
| 0.0055           | 1324          | 15         | 1                 | Pass             |
| 0.0063           | 433           | 15         | 3                 | Pass             |
| 0.0071           | 112           | 15         | 13                | Pass             |
| 0.0079           | 102           | 15         | 14                | Pass             |
| 0.0087           | 89            | 14         | 15                | Pass             |
| 0.0095           | 77            | 14         | 18                | Pass             |
| 0.0103           | 66            | 14         | 21                | Pass             |
| 0.0112           | 61            | 14         | 22                | Pass             |
| 0.0120           | 58            | 14         | 24                | Pass             |
| 0.0128           | 54            | 14         | 25                | Pass             |
| 0.0136           | 50            | 14         | 28                | Pass             |
| 0.0144           | 49            | 14         | 28                | Pass             |
| 0.0152           | 47            | 14         | 29                | Pass             |
| 0.0160           | 43            | 14         | 32                | Pass             |
| 0.0168           | 40            | 14         | 35                | Pass             |
| 0.0176           | 36            | 13         | 36                | Pass             |
| 0.0184           | 36            | 13         | 36                | Pass             |
| 0.0192           | 32            | 13         | 40                | Pass             |
| 0.0200           | 31            | 13         | 41                | Pass             |
| 0.0208           | 31            | 13         | 41                | Pass             |
| 0.0216           | 29            | 13         | 44                | Pass             |
| 0.0224           | 29            | 13         | 44                | Pass             |
| 0.0232           | 27            | 13         | 48                | Pass             |
| 0.0241           | 26            | 13         | 50                | Pass             |
| 0.0249           | 26            | 13         | 50                | Pass             |
| 0.0257           | 26            | 13         | 50                | Pass             |
| 0.0265           | 25            | 13         | 52                | Pass             |
| 0.0273           | 23            | 13         | 56                | Pass             |
| 0.0281           | 23            | 13         | 56                | Pass             |
| 0.0289           | 23            | 13         | 56                | Pass             |
| 0.0297           | 23            | 13         | 56                | Pass             |
| 0.0305           | 23            | 13         | 56                | Pass             |
| 0.0313           | 21            | 13         | 61                | Pass             |
| 0.0321           | 19            | 13         | 68                | Pass             |
| 0.0329           | 18            | 13         | 72                | Pass             |
| 0.0337           | 17            | 13         | 76                | Pass             |



|        |    |    |     |      |
|--------|----|----|-----|------|
| 0.0345 | 16 | 13 | 81  | Pass |
| 0.0353 | 16 | 13 | 81  | Pass |
| 0.0361 | 15 | 13 | 86  | Pass |
| 0.0369 | 15 | 13 | 86  | Pass |
| 0.0378 | 14 | 13 | 92  | Pass |
| 0.0386 | 13 | 13 | 100 | Pass |
| 0.0394 | 13 | 13 | 100 | Pass |
| 0.0402 | 13 | 13 | 100 | Pass |
| 0.0410 | 13 | 13 | 100 | Pass |
| 0.0418 | 13 | 13 | 100 | Pass |
| 0.0426 | 13 | 13 | 100 | Pass |
| 0.0434 | 13 | 13 | 100 | Pass |
| 0.0442 | 13 | 13 | 100 | Pass |
| 0.0450 | 13 | 13 | 100 | Pass |
| 0.0458 | 11 | 13 | 118 | Fail |
| 0.0466 | 11 | 13 | 118 | Fail |
| 0.0474 | 11 | 13 | 118 | Fail |
| 0.0482 | 11 | 13 | 118 | Fail |
| 0.0490 | 11 | 13 | 118 | Fail |
| 0.0498 | 11 | 13 | 118 | Fail |
| 0.0507 | 11 | 13 | 118 | Fail |
| 0.0515 | 11 | 13 | 118 | Fail |
| 0.0523 | 11 | 13 | 118 | Fail |
| 0.0531 | 11 | 13 | 118 | Fail |
| 0.0539 | 11 | 13 | 118 | Fail |
| 0.0547 | 11 | 13 | 118 | Fail |
| 0.0555 | 11 | 13 | 118 | Fail |
| 0.0563 | 10 | 13 | 130 | Fail |
| 0.0571 | 10 | 13 | 130 | Fail |
| 0.0579 | 9  | 13 | 144 | Fail |
| 0.0587 | 9  | 12 | 133 | Fail |
| 0.0595 | 8  | 12 | 150 | Fail |
| 0.0603 | 8  | 12 | 150 | Fail |
| 0.0611 | 8  | 12 | 150 | Fail |
| 0.0619 | 8  | 12 | 150 | Fail |
| 0.0627 | 8  | 12 | 150 | Fail |
| 0.0635 | 8  | 12 | 150 | Fail |
| 0.0644 | 8  | 12 | 150 | Fail |
| 0.0652 | 8  | 12 | 150 | Fail |
| 0.0660 | 8  | 11 | 137 | Fail |
| 0.0668 | 8  | 11 | 137 | Fail |
| 0.0676 | 8  | 11 | 137 | Fail |
| 0.0684 | 8  | 11 | 137 | Fail |
| 0.0692 | 8  | 11 | 137 | Fail |
| 0.0700 | 8  | 11 | 137 | Fail |
| 0.0708 | 8  | 11 | 137 | Fail |
| 0.0716 | 7  | 11 | 157 | Fail |
| 0.0724 | 7  | 11 | 157 | Fail |
| 0.0732 | 7  | 11 | 157 | Fail |
| 0.0740 | 7  | 11 | 157 | Fail |
| 0.0748 | 6  | 11 | 183 | Fail |
| 0.0756 | 6  | 11 | 183 | Fail |
| 0.0764 | 6  | 11 | 183 | Fail |
| 0.0773 | 6  | 11 | 183 | Fail |
| 0.0781 | 6  | 10 | 166 | Fail |



|        |   |    |     |      |
|--------|---|----|-----|------|
| 0.0789 | 6 | 10 | 166 | Fail |
| 0.0797 | 6 | 10 | 166 | Fail |
| 0.0805 | 6 | 10 | 166 | Fail |
| 0.0813 | 6 | 10 | 166 | Fail |
| 0.0821 | 6 | 10 | 166 | Fail |
| 0.0829 | 6 | 10 | 166 | Fail |
| 0.0837 | 5 | 10 | 200 | Fail |
| 0.0845 | 5 | 10 | 200 | Fail |

The development has an increase in flow durations from 1/2 Predeveloped 2 year flow to the 2 year flow or more than a 10% increase from the 2 year to the 50 year flow.

**Water Quality BMP Flow and Volume for POC #1**

On-line facility volume: 0 acre-feet  
 On-line facility target flow: 0 cfs.  
 Adjusted for 15 min: 0 cfs.  
 Off-line facility target flow: 0 cfs.  
 Adjusted for 15 min: 0 cfs.

**LID Report**

| LID Technique                     | Used for      | Total Volume | Volume    | Infiltration | Cumulative   |
|-----------------------------------|---------------|--------------|-----------|--------------|--------------|
| Percent                           | Water Quality | Percent      | Through   | Volume       | Volume       |
| Volume                            | Water Quality | Treatment    | Facility  | (ac-ft.)     | Infiltration |
| Infiltrated                       | Treated       | (ac-ft)      | (ac-ft)   |              | Credit       |
| Gravel Trench Bed 1 POC           | N             | 1233.45      |           |              | N            |
| 100.00                            |               |              |           |              |              |
| Total Volume Infiltrated          |               | 1233.45      | 0.00      | 0.00         |              |
| 100.00                            | 0.00          | 0%           | No Treat. | Credit       |              |
| Compliance with LID Standard 8    |               |              |           |              |              |
| Duration Analysis Result = Passed |               |              |           |              |              |

**PerlnD and Implnd Changes**

No changes have been made.

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WWHM2012  
PROJECT REPORT

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**Project Name:** BLOCK A OFFSITE Infil Trench  
**Site Name:** BLOCK A OFFSITE areas (47<sup>th</sup>)  
**Site Address:**  
**City** : Arlington  
**Report Date:** 5/26/2023  
**Gage** : Everett  
**Data Start** : 1948/10/01  
**Data End** : 2009/09/30  
**Precip Scale:** 1.20  
**Version Date:** 2021/08/18  
**Version** : 4.2.18

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**Low Flow Threshold for POC 1** : 50 Percent of the 2 Year

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**High Flow Threshold for POC 1:** 50 year

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**PREDEVELOPED LAND USE**

**Name** : Basin 1  
**Bypass:** No

**GroundWater:** No

|                            |             |
|----------------------------|-------------|
| <u>Pervious Land Use</u>   | <u>acre</u> |
| A B, Forest, Flat          | .57         |
| <b>Pervious Total</b>      | <b>0.57</b> |
| <u>Impervious Land Use</u> | <u>acre</u> |
| <b>Impervious Total</b>    | <b>0</b>    |
| <b>Basin Total</b>         | <b>0.57</b> |

---

**Element Flows To:**

|                |                  |                    |
|----------------|------------------|--------------------|
| <b>Surface</b> | <b>Interflow</b> | <b>Groundwater</b> |
|----------------|------------------|--------------------|

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**MITIGATED LAND USE**

**Name** : Basin 1  
**Bypass:** No



GroundWater: No

|                            |             |
|----------------------------|-------------|
| <u>Pervious Land Use</u>   | <u>acre</u> |
| A B, Lawn, Flat            | .05         |
| <b>Pervious Total</b>      | <b>0.05</b> |
| <u>Impervious Land Use</u> | <u>acre</u> |
| ROADS FLAT                 | 0.33        |
| SIDEWALKS FLAT             | 0.19        |
| <b>Impervious Total</b>    | <b>0.52</b> |
| <b>Basin Total</b>         | <b>0.57</b> |

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**Element Flows To:**

| <b>Surface</b>      | <b>Interflow</b>    | <b>Groundwater</b> |
|---------------------|---------------------|--------------------|
| Gravel Trench Bed 1 | Gravel Trench Bed 1 |                    |

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**Name** : Gravel Trench Bed 1  
**Bottom Length:** 200.00 ft.  
**Bottom Width:** 20.00 ft.  
**Trench bottom slope 1:** 0 To 1  
**Trench left side slope 0:** 0 To 1  
**Trench right side slope 2:** 0 To 1  
**Material thickness of first layer:** 3  
**Pour Space of material for first layer:** 0.3  
**Material thickness of second layer:** 0  
**Pour Space of material for second layer:** 0  
**Material thickness of third layer:** 0  
**Pour Space of material for third layer:** 0  
**Infiltration On**  
**Infiltration rate:** 0.75  
**Infiltration safety factor:** 1  
**Total Volume Infiltrated (ac-ft.):** 100.746  
**Total Volume Through Riser (ac-ft.):** 0.003  
**Total Volume Through Facility (ac-ft.):** 100.748  
**Percent Infiltrated:** 100  
**Total Precip Applied to Facility:** 0  
**Total Evap From Facility:** 0  
**Discharge Structure**  
**Riser Height:** 2.95 ft.  
**Riser Diameter:** 12 in.

**Element Flows To:**

|          |          |
|----------|----------|
| Outlet 1 | Outlet 2 |
|----------|----------|

**Gravel Trench Bed Hydraulic Table**

| <u>Stage(feet)</u> | <u>Area(ac.)</u> | <u>Volume(ac-ft.)</u> | <u>Discharge(cfs)</u> | <u>Infilt(cfs)</u> |
|--------------------|------------------|-----------------------|-----------------------|--------------------|
| 0.0000             | 0.091            | 0.000                 | 0.000                 | 0.000              |
| 0.0333             | 0.091            | 0.000                 | 0.000                 | 0.069              |
| 0.0667             | 0.091            | 0.001                 | 0.000                 | 0.069              |
| 0.1000             | 0.091            | 0.002                 | 0.000                 | 0.069              |
| 0.1333             | 0.091            | 0.003                 | 0.000                 | 0.069              |
| 0.1667             | 0.091            | 0.004                 | 0.000                 | 0.069              |
| 0.2000             | 0.091            | 0.005                 | 0.000                 | 0.069              |
| 0.2333             | 0.091            | 0.006                 | 0.000                 | 0.069              |
| 0.2667             | 0.091            | 0.007                 | 0.000                 | 0.069              |
| 0.3000             | 0.091            | 0.008                 | 0.000                 | 0.069              |
| 0.3333             | 0.091            | 0.009                 | 0.000                 | 0.069              |
| 0.3667             | 0.091            | 0.010                 | 0.000                 | 0.069              |
| 0.4000             | 0.091            | 0.011                 | 0.000                 | 0.069              |
| 0.4333             | 0.091            | 0.011                 | 0.000                 | 0.069              |
| 0.4667             | 0.091            | 0.012                 | 0.000                 | 0.069              |
| 0.5000             | 0.091            | 0.013                 | 0.000                 | 0.069              |
| 0.5333             | 0.091            | 0.014                 | 0.000                 | 0.069              |
| 0.5667             | 0.091            | 0.015                 | 0.000                 | 0.069              |
| 0.6000             | 0.091            | 0.016                 | 0.000                 | 0.069              |
| 0.6333             | 0.091            | 0.017                 | 0.000                 | 0.069              |
| 0.6667             | 0.091            | 0.018                 | 0.000                 | 0.069              |
| 0.7000             | 0.091            | 0.019                 | 0.000                 | 0.069              |
| 0.7333             | 0.091            | 0.020                 | 0.000                 | 0.069              |
| 0.7667             | 0.091            | 0.021                 | 0.000                 | 0.069              |
| 0.8000             | 0.091            | 0.022                 | 0.000                 | 0.069              |
| 0.8333             | 0.091            | 0.023                 | 0.000                 | 0.069              |
| 0.8667             | 0.091            | 0.023                 | 0.000                 | 0.069              |
| 0.9000             | 0.091            | 0.024                 | 0.000                 | 0.069              |
| 0.9333             | 0.091            | 0.025                 | 0.000                 | 0.069              |
| 0.9667             | 0.091            | 0.026                 | 0.000                 | 0.069              |
| 1.0000             | 0.091            | 0.027                 | 0.000                 | 0.069              |
| 1.0333             | 0.091            | 0.028                 | 0.000                 | 0.069              |
| 1.0667             | 0.091            | 0.029                 | 0.000                 | 0.069              |
| 1.1000             | 0.091            | 0.030                 | 0.000                 | 0.069              |
| 1.1333             | 0.091            | 0.031                 | 0.000                 | 0.069              |
| 1.1667             | 0.091            | 0.032                 | 0.000                 | 0.069              |
| 1.2000             | 0.091            | 0.033                 | 0.000                 | 0.069              |
| 1.2333             | 0.091            | 0.034                 | 0.000                 | 0.069              |
| 1.2667             | 0.091            | 0.034                 | 0.000                 | 0.069              |
| 1.3000             | 0.091            | 0.035                 | 0.000                 | 0.069              |
| 1.3333             | 0.091            | 0.036                 | 0.000                 | 0.069              |
| 1.3667             | 0.091            | 0.037                 | 0.000                 | 0.069              |
| 1.4000             | 0.091            | 0.038                 | 0.000                 | 0.069              |
| 1.4333             | 0.091            | 0.039                 | 0.000                 | 0.069              |
| 1.4667             | 0.091            | 0.040                 | 0.000                 | 0.069              |
| 1.5000             | 0.091            | 0.041                 | 0.000                 | 0.069              |
| 1.5333             | 0.091            | 0.042                 | 0.000                 | 0.069              |
| 1.5667             | 0.091            | 0.043                 | 0.000                 | 0.069              |
| 1.6000             | 0.091            | 0.044                 | 0.000                 | 0.069              |
| 1.6333             | 0.091            | 0.045                 | 0.000                 | 0.069              |
| 1.6667             | 0.091            | 0.045                 | 0.000                 | 0.069              |
| 1.7000             | 0.091            | 0.046                 | 0.000                 | 0.069              |
| 1.7333             | 0.091            | 0.047                 | 0.000                 | 0.069              |



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|        |       |       |       |       |
|--------|-------|-------|-------|-------|
| 1.7667 | 0.091 | 0.048 | 0.000 | 0.069 |
| 1.8000 | 0.091 | 0.049 | 0.000 | 0.069 |
| 1.8333 | 0.091 | 0.050 | 0.000 | 0.069 |
| 1.8667 | 0.091 | 0.051 | 0.000 | 0.069 |
| 1.9000 | 0.091 | 0.052 | 0.000 | 0.069 |
| 1.9333 | 0.091 | 0.053 | 0.000 | 0.069 |
| 1.9667 | 0.091 | 0.054 | 0.000 | 0.069 |
| 2.0000 | 0.091 | 0.055 | 0.000 | 0.069 |
| 2.0333 | 0.091 | 0.056 | 0.000 | 0.069 |
| 2.0667 | 0.091 | 0.056 | 0.000 | 0.069 |
| 2.1000 | 0.091 | 0.057 | 0.000 | 0.069 |
| 2.1333 | 0.091 | 0.058 | 0.000 | 0.069 |
| 2.1667 | 0.091 | 0.059 | 0.000 | 0.069 |
| 2.2000 | 0.091 | 0.060 | 0.000 | 0.069 |
| 2.2333 | 0.091 | 0.061 | 0.000 | 0.069 |
| 2.2667 | 0.091 | 0.062 | 0.000 | 0.069 |
| 2.3000 | 0.091 | 0.063 | 0.000 | 0.069 |
| 2.3333 | 0.091 | 0.064 | 0.000 | 0.069 |
| 2.3667 | 0.091 | 0.065 | 0.000 | 0.069 |
| 2.4000 | 0.091 | 0.066 | 0.000 | 0.069 |
| 2.4333 | 0.091 | 0.067 | 0.000 | 0.069 |
| 2.4667 | 0.091 | 0.068 | 0.000 | 0.069 |
| 2.5000 | 0.091 | 0.068 | 0.000 | 0.069 |
| 2.5333 | 0.091 | 0.069 | 0.000 | 0.069 |
| 2.5667 | 0.091 | 0.070 | 0.000 | 0.069 |
| 2.6000 | 0.091 | 0.071 | 0.000 | 0.069 |
| 2.6333 | 0.091 | 0.072 | 0.000 | 0.069 |
| 2.6667 | 0.091 | 0.073 | 0.000 | 0.069 |
| 2.7000 | 0.091 | 0.074 | 0.000 | 0.069 |
| 2.7333 | 0.091 | 0.075 | 0.000 | 0.069 |
| 2.7667 | 0.091 | 0.076 | 0.000 | 0.069 |
| 2.8000 | 0.091 | 0.077 | 0.000 | 0.069 |
| 2.8333 | 0.091 | 0.078 | 0.000 | 0.069 |
| 2.8667 | 0.091 | 0.079 | 0.000 | 0.069 |
| 2.9000 | 0.091 | 0.079 | 0.000 | 0.069 |
| 2.9333 | 0.091 | 0.080 | 0.000 | 0.069 |
| 2.9667 | 0.091 | 0.081 | 0.022 | 0.069 |
| 3.0000 | 0.091 | 0.082 | 0.118 | 0.069 |

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**ANALYSIS RESULTS**

**Stream Protection Duration**

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**Predeveloped Landuse Totals for POC #1**  
**Total Pervious Area:0.57**  
**Total Impervious Area:0**

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**Mitigated Landuse Totals for POC #1**  
**Total Pervious Area:0.05**



**Total Impervious Area:0.52**

**Flow Frequency Return Periods for Predeveloped. POC #1**

| <u>Return Period</u> | <u>Flow(cfs)</u> |
|----------------------|------------------|
| 2 year               | 0.000654         |
| 5 year               | 0.001419         |
| 10 year              | 0.002276         |
| 25 year              | 0.003975         |
| 50 year              | 0.005874         |
| 100 year             | 0.008521         |

**Flow Frequency Return Periods for Mitigated. POC #1**

| <u>Return Period</u> | <u>Flow(cfs)</u> |
|----------------------|------------------|
| 2 year               | 0                |
| 5 year               | 0                |
| 10 year              | 0                |
| 25 year              | 0                |
| 50 year              | 0                |
| 100 year             | 0                |

**Stream Protection Duration**

**Annual Peaks for Predeveloped and Mitigated. POC #1**

| <u>Year</u> | <u>Predeveloped</u> | <u>Mitigated</u> |
|-------------|---------------------|------------------|
| 1949        | 0.000               | 0.000            |
| 1950        | 0.001               | 0.000            |
| 1951        | 0.001               | 0.000            |
| 1952        | 0.000               | 0.000            |
| 1953        | 0.000               | 0.000            |
| 1954        | 0.003               | 0.000            |
| 1955        | 0.002               | 0.000            |
| 1956        | 0.000               | 0.000            |
| 1957        | 0.000               | 0.000            |
| 1958        | 0.000               | 0.000            |
| 1959        | 0.001               | 0.000            |
| 1960        | 0.001               | 0.000            |
| 1961        | 0.002               | 0.000            |
| 1962        | 0.000               | 0.000            |
| 1963        | 0.000               | 0.000            |
| 1964        | 0.001               | 0.000            |
| 1965        | 0.000               | 0.000            |
| 1966        | 0.000               | 0.000            |
| 1967        | 0.001               | 0.000            |
| 1968        | 0.000               | 0.000            |
| 1969        | 0.000               | 0.000            |
| 1970        | 0.000               | 0.000            |
| 1971        | 0.002               | 0.000            |
| 1972        | 0.000               | 0.000            |
| 1973        | 0.000               | 0.000            |
| 1974        | 0.001               | 0.000            |
| 1975        | 0.000               | 0.000            |
| 1976        | 0.001               | 0.000            |
| 1977        | 0.000               | 0.000            |
| 1978        | 0.000               | 0.000            |



|      |       |       |
|------|-------|-------|
| 1979 | 0.001 | 0.000 |
| 1980 | 0.000 | 0.000 |
| 1981 | 0.000 | 0.000 |
| 1982 | 0.001 | 0.000 |
| 1983 | 0.000 | 0.000 |
| 1984 | 0.000 | 0.000 |
| 1985 | 0.001 | 0.000 |
| 1986 | 0.004 | 0.000 |
| 1987 | 0.003 | 0.000 |
| 1988 | 0.000 | 0.000 |
| 1989 | 0.000 | 0.000 |
| 1990 | 0.000 | 0.000 |
| 1991 | 0.000 | 0.000 |
| 1992 | 0.000 | 0.000 |
| 1993 | 0.000 | 0.000 |
| 1994 | 0.000 | 0.000 |
| 1995 | 0.001 | 0.000 |
| 1996 | 0.005 | 0.000 |
| 1997 | 0.014 | 0.000 |
| 1998 | 0.000 | 0.000 |
| 1999 | 0.000 | 0.000 |
| 2000 | 0.001 | 0.000 |
| 2001 | 0.000 | 0.000 |
| 2002 | 0.000 | 0.000 |
| 2003 | 0.000 | 0.000 |
| 2004 | 0.000 | 0.000 |
| 2005 | 0.000 | 0.000 |
| 2006 | 0.015 | 0.000 |
| 2007 | 0.000 | 0.000 |
| 2008 | 0.001 | 0.035 |
| 2009 | 0.000 | 0.000 |

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**Stream Protection Duration**

**Ranked Annual Peaks for Predeveloped and Mitigated. POC #1**

| <b>Rank</b> | <b>Predeveloped</b> | <b>Mitigated</b> |
|-------------|---------------------|------------------|
| 1           | 0.0152              | 0.0353           |
| 2           | 0.0141              | 0.0000           |
| 3           | 0.0052              | 0.0000           |
| 4           | 0.0040              | 0.0000           |
| 5           | 0.0031              | 0.0000           |
| 6           | 0.0026              | 0.0000           |
| 7           | 0.0024              | 0.0000           |
| 8           | 0.0022              | 0.0000           |
| 9           | 0.0021              | 0.0000           |
| 10          | 0.0015              | 0.0000           |
| 11          | 0.0013              | 0.0000           |
| 12          | 0.0012              | 0.0000           |
| 13          | 0.0010              | 0.0000           |
| 14          | 0.0010              | 0.0000           |
| 15          | 0.0009              | 0.0000           |
| 16          | 0.0009              | 0.0000           |
| 17          | 0.0009              | 0.0000           |
| 18          | 0.0009              | 0.0000           |
| 19          | 0.0008              | 0.0000           |



|    |        |        |
|----|--------|--------|
| 20 | 0.0008 | 0.0000 |
| 21 | 0.0007 | 0.0000 |
| 22 | 0.0007 | 0.0000 |
| 23 | 0.0005 | 0.0000 |
| 24 | 0.0005 | 0.0000 |
| 25 | 0.0005 | 0.0000 |
| 26 | 0.0005 | 0.0000 |
| 27 | 0.0005 | 0.0000 |
| 28 | 0.0005 | 0.0000 |
| 29 | 0.0005 | 0.0000 |
| 30 | 0.0005 | 0.0000 |
| 31 | 0.0005 | 0.0000 |
| 32 | 0.0005 | 0.0000 |
| 33 | 0.0005 | 0.0000 |
| 34 | 0.0005 | 0.0000 |
| 35 | 0.0005 | 0.0000 |
| 36 | 0.0005 | 0.0000 |
| 37 | 0.0005 | 0.0000 |
| 38 | 0.0005 | 0.0000 |
| 39 | 0.0005 | 0.0000 |
| 40 | 0.0005 | 0.0000 |
| 41 | 0.0005 | 0.0000 |
| 42 | 0.0005 | 0.0000 |
| 43 | 0.0005 | 0.0000 |
| 44 | 0.0005 | 0.0000 |
| 45 | 0.0005 | 0.0000 |
| 46 | 0.0005 | 0.0000 |
| 47 | 0.0005 | 0.0000 |
| 48 | 0.0005 | 0.0000 |
| 49 | 0.0005 | 0.0000 |
| 50 | 0.0004 | 0.0000 |
| 51 | 0.0004 | 0.0000 |
| 52 | 0.0004 | 0.0000 |
| 53 | 0.0004 | 0.0000 |
| 54 | 0.0004 | 0.0000 |
| 55 | 0.0004 | 0.0000 |
| 56 | 0.0004 | 0.0000 |
| 57 | 0.0004 | 0.0000 |
| 58 | 0.0004 | 0.0000 |
| 59 | 0.0004 | 0.0000 |
| 60 | 0.0004 | 0.0000 |
| 61 | 0.0003 | 0.0000 |

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**Stream Protection Duration**

**POC #1**

**The Facility PASSED**

**The Facility PASSED.**

| <b>Flow(cfs)</b> | <b>Predev</b> | <b>Mit</b> | <b>Percentage</b> | <b>Pass/Fail</b> |
|------------------|---------------|------------|-------------------|------------------|
| 0.0003           | 2357          | 10         | 0                 | Pass             |
| 0.0004           | 1327          | 9          | 0                 | Pass             |
| 0.0004           | 434           | 9          | 2                 | Pass             |
| 0.0005           | 112           | 9          | 8                 | Pass             |



|        |     |   |    |      |
|--------|-----|---|----|------|
| 0.0006 | 103 | 9 | 8  | Pass |
| 0.0006 | 89  | 9 | 10 | Pass |
| 0.0007 | 77  | 9 | 11 | Pass |
| 0.0007 | 66  | 9 | 13 | Pass |
| 0.0008 | 61  | 9 | 14 | Pass |
| 0.0008 | 58  | 9 | 15 | Pass |
| 0.0009 | 54  | 9 | 16 | Pass |
| 0.0009 | 50  | 9 | 18 | Pass |
| 0.0010 | 49  | 9 | 18 | Pass |
| 0.0011 | 47  | 9 | 19 | Pass |
| 0.0011 | 43  | 9 | 20 | Pass |
| 0.0012 | 40  | 9 | 22 | Pass |
| 0.0012 | 36  | 9 | 25 | Pass |
| 0.0013 | 36  | 9 | 25 | Pass |
| 0.0013 | 32  | 9 | 28 | Pass |
| 0.0014 | 31  | 9 | 29 | Pass |
| 0.0014 | 31  | 9 | 29 | Pass |
| 0.0015 | 29  | 9 | 31 | Pass |
| 0.0016 | 29  | 9 | 31 | Pass |
| 0.0016 | 27  | 9 | 33 | Pass |
| 0.0017 | 26  | 8 | 30 | Pass |
| 0.0017 | 26  | 8 | 30 | Pass |
| 0.0018 | 26  | 8 | 30 | Pass |
| 0.0018 | 25  | 8 | 32 | Pass |
| 0.0019 | 23  | 8 | 34 | Pass |
| 0.0020 | 23  | 8 | 34 | Pass |
| 0.0020 | 23  | 8 | 34 | Pass |
| 0.0021 | 23  | 8 | 34 | Pass |
| 0.0021 | 23  | 8 | 34 | Pass |
| 0.0022 | 21  | 8 | 38 | Pass |
| 0.0022 | 19  | 8 | 42 | Pass |
| 0.0023 | 18  | 8 | 44 | Pass |
| 0.0023 | 17  | 8 | 47 | Pass |
| 0.0024 | 16  | 8 | 50 | Pass |
| 0.0025 | 16  | 8 | 50 | Pass |
| 0.0025 | 15  | 8 | 53 | Pass |
| 0.0026 | 15  | 8 | 53 | Pass |
| 0.0026 | 14  | 8 | 57 | Pass |
| 0.0027 | 13  | 8 | 61 | Pass |
| 0.0027 | 13  | 8 | 61 | Pass |
| 0.0028 | 13  | 8 | 61 | Pass |
| 0.0028 | 13  | 8 | 61 | Pass |
| 0.0029 | 13  | 8 | 61 | Pass |
| 0.0030 | 13  | 7 | 53 | Pass |
| 0.0030 | 13  | 7 | 53 | Pass |
| 0.0031 | 13  | 7 | 53 | Pass |
| 0.0031 | 13  | 7 | 53 | Pass |
| 0.0032 | 11  | 7 | 63 | Pass |
| 0.0032 | 11  | 7 | 63 | Pass |
| 0.0033 | 11  | 7 | 63 | Pass |
| 0.0034 | 11  | 7 | 63 | Pass |
| 0.0034 | 11  | 7 | 63 | Pass |
| 0.0035 | 11  | 7 | 63 | Pass |
| 0.0035 | 11  | 7 | 63 | Pass |
| 0.0036 | 11  | 7 | 63 | Pass |



|        |    |   |     |      |
|--------|----|---|-----|------|
| 0.0036 | 11 | 7 | 63  | Pass |
| 0.0037 | 11 | 7 | 63  | Pass |
| 0.0037 | 11 | 7 | 63  | Pass |
| 0.0038 | 11 | 7 | 63  | Pass |
| 0.0039 | 11 | 7 | 63  | Pass |
| 0.0039 | 10 | 7 | 70  | Pass |
| 0.0040 | 10 | 7 | 70  | Pass |
| 0.0040 | 9  | 7 | 77  | Pass |
| 0.0041 | 9  | 7 | 77  | Pass |
| 0.0041 | 8  | 7 | 87  | Pass |
| 0.0042 | 8  | 7 | 87  | Pass |
| 0.0042 | 8  | 7 | 87  | Pass |
| 0.0043 | 8  | 6 | 75  | Pass |
| 0.0044 | 8  | 6 | 75  | Pass |
| 0.0044 | 8  | 6 | 75  | Pass |
| 0.0045 | 8  | 6 | 75  | Pass |
| 0.0045 | 8  | 6 | 75  | Pass |
| 0.0046 | 8  | 6 | 75  | Pass |
| 0.0046 | 8  | 6 | 75  | Pass |
| 0.0047 | 8  | 6 | 75  | Pass |
| 0.0048 | 8  | 6 | 75  | Pass |
| 0.0048 | 8  | 6 | 75  | Pass |
| 0.0049 | 8  | 6 | 75  | Pass |
| 0.0049 | 8  | 6 | 75  | Pass |
| 0.0050 | 7  | 6 | 85  | Pass |
| 0.0050 | 7  | 6 | 85  | Pass |
| 0.0051 | 7  | 6 | 85  | Pass |
| 0.0051 | 7  | 6 | 85  | Pass |
| 0.0052 | 6  | 6 | 100 | Pass |
| 0.0053 | 6  | 6 | 100 | Pass |
| 0.0053 | 6  | 6 | 100 | Pass |
| 0.0054 | 6  | 5 | 83  | Pass |
| 0.0054 | 6  | 5 | 83  | Pass |
| 0.0055 | 6  | 5 | 83  | Pass |
| 0.0055 | 6  | 5 | 83  | Pass |
| 0.0056 | 6  | 5 | 83  | Pass |
| 0.0056 | 6  | 5 | 83  | Pass |
| 0.0057 | 6  | 5 | 83  | Pass |
| 0.0058 | 6  | 4 | 66  | Pass |
| 0.0058 | 5  | 4 | 80  | Pass |
| 0.0059 | 5  | 4 | 80  | Pass |

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**Water Quality BMP Flow and Volume for POC #1**  
 On-line facility volume: 0 acre-feet  
 On-line facility target flow: 0 cfs.  
 Adjusted for 15 min: 0 cfs.  
 Off-line facility target flow: 0 cfs.  
 Adjusted for 15 min: 0 cfs.

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**LID Report**

| LID Technique<br>Percent | Used for<br>Water Quality<br>Percent | Total Volume<br>Comment | Volume | Infiltration | Cumulative |
|--------------------------|--------------------------------------|-------------------------|--------|--------------|------------|
|--------------------------|--------------------------------------|-------------------------|--------|--------------|------------|



| Volume                            | Treatment?<br>Water Quality | Needs<br>Treatment | Through<br>Facility | Volume<br>(ac-ft.) | Volume<br>Infiltration<br>Credit |
|-----------------------------------|-----------------------------|--------------------|---------------------|--------------------|----------------------------------|
| Infiltrated                       | Treated                     | (ac-ft)            | (ac-ft)             |                    |                                  |
| Gravel Trench Bed 1 POC           | N                           | 91.68              |                     |                    | N                                |
| 100.00                            |                             |                    |                     |                    |                                  |
| Total Volume Infiltrated          |                             | 91.68              | 0.00                | 0.00               |                                  |
| 100.00                            | 0.00 0%                     | No Treat. Credit   |                     |                    |                                  |
| Compliance with LID Standard 8    |                             |                    |                     |                    |                                  |
| Duration Analysis Result = Passed |                             |                    |                     |                    |                                  |

**PerlnD and Implnd Changes**

No changes have been made.

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## **Appendix B – Hydraulic Analysis**

### **Appendix B Summary:**

*Narrative*

*Conveyance Capacity Table*

New pipe systems shall be designed with sufficient capacity to convey and contain the 25-year peak flow. Verification of capacity and performance must be provided for each element of the conveyance system. The analysis must show design flows for all drainage facilities within the development, as well as those off-site that are affected by the development.

In general catch basins immediately connect to infiltration trenches without collecting significant runoff areas, and the designed 8" connecting pipes are to function as intended at the minimum 0.5% slope or more. Additionally, conveyance capacity calculation will be included in the construction design stage of the project.