

# Altmann Oliver Associates, LLC

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# AOA

Environmental  
Planning &  
Landscape  
Architecture



October 28, 2024

AOA-6739

Sam Salo, PE  
ssalo@encompasses.net

**SUBJECT: Wetland and Stream Study for American Pride Lending Property  
212 Todd Road NE, Parcel 042022-2008, Puyallup, WA (P-21-0146)  
City Permit Application # PRGR20230114 (Revised)**

Dear Sam:

We have updated this study for the change in site plan back to a construction yard. This report also addresses the comments presented in the April 6, 2023 letter from Confluence, third party peer review consultant for the City of Puyallup.

## **1.0 BACKGROUND**

On March 1, 2022 I conducted an initial wetland and stream reconnaissance on and adjacent to the subject property utilizing the methodology outlined in the May 2010 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)*. An additional field investigation was conducted by AOA on June 23, 2022.

At the time of the field investigations the property was entirely graveled except for a small house in the northwest corner of the site. Topography is flat and no significant native plant communities or wetlands are located on the property.

Wapato Creek flows from north to south off-site to the southeast. Although access was very limited, a narrow Riverine wetland (Wetland A) was observed in places along the creek. However, no wetlands were observed adjacent to the creek in the area in closest proximity to the subject property. **Attachment A** contains a data sheet prepared for the off-site upland area immediately adjacent to the creek within closest proximity to the property.

## **2.0 WAPATO CREEK AND WETLAND A**

Wapato Creek is known to support salmonids and would therefore be considered a Type II stream by the City of Puyallup. Type II streams require a minimum standard buffer of 100 feet per PMC 21.06.1050(2)(b). There is also a required 10-foot structure setback from the edge of the buffer. Wetland A consists of a narrow Riverine Hydrogeomorphic (HGM) class wetland. Vegetation within Wetland A and the riparian corridor of Wapato Creek in the vicinity of the site consisted primarily of a forested plant community that included red alder (*Alnus rubra*), Pacific willow (*Salix lasiandra*), Himalayan blackberry (*Rubus armeniacus*), climbing nightshade (*Solanum dulcamara*), and English ivy (*Hedera helix*).

Wetland A meets the criteria for a Category II wetland with 6 Habitat Points per the current City of Puyallup rating system (**Attachment B**). Category II wetlands with 6 Habitat Points require a standard 150-foot buffer adjacent high intensity land uses per PMC 21.06.930(2)(c). However, since Wetland A is not located adjacent to the creek in proximity to the site, it appears the Wapato Creek buffer would be more restrictive.

As requested by Confluence, we have prepared a vicinity map (**Figure 1**) and figure (**Figure 2**) showing critical areas within 300 feet of the site.

## **3.0 PROPOSED PROJECT**

The proposed project consists of an outdoor construction yard. As part of the project, the 100-foot buffer from Wapato Creek would be fully restored and protected in perpetuity.

### **3.1 Drainage Plan**

A drainage plan has been prepared by Encompass (see civil plans for all stormwater information).

### **3.2 Critical Area Impacts**

The project has been designed to avoid all critical area impacts and the required 100-foot buffer from Wapato Creek will be preserved in perpetuity. Furthermore, all existing gravel within the buffer and structure setback will be removed and the entire buffer planted with a variety of native tree and shrub species. There are no known or anticipated impacts to the on-site buffer or off-site critical areas from the proposed project.

#### **4.0 BUFFER RESTORATION**

The City of Puyallup requires that the minimum critical area buffer be vegetated with native species as part of any proposed project. Since the 100-foot Wapato Creek buffer extends into the subject property (**Drawing W1.0**) and the buffer area is currently gravel, a buffer restoration planting plan is required as part of a proposed site plan. Restoration will consist of gravel removal and re-planting with native trees and shrubs. A rail fence will then be installed along the buffer boundary.

#### **4.1 Goal, Objectives, and Performance Standards for Restoration Area**

The primary goal of the restoration plan is to increase the habitat function of the enhanced buffer. To meet this goal, the following objectives and performance standards have been incorporated into the design of the plan:

**Objective A:** Increase the structural and plant species diversity within the restoration area.

**Performance Standard:** *Following every monitoring event for a period of at least five years, the planting area will contain at least 7 native plant species. There will be 100% survival of all woody planted species throughout the restoration area at the end of the first year of planting. For Years 2-5, success will be based on an 80% survival rate or similar number of recolonized native woody plants. Areal coverage of plantings or native re-colonized woody species will be at least 10% at Year 1, 20% at Year 2, 30% at Year 3, 40% at Year 4, and 50% at Year 5.*

**Objective B:** Limit the amount of invasive and exotic species within the restoration area.

**Performance Standard:** *After construction and following every monitoring event for a period of five years, exotic and invasive plant species will be maintained at levels below 10% total cover in the designated restoration area.*

#### **4.2 Construction Management**

Prior to commencement of any work in the restoration area the limits will be staked. A pre-construction meeting should be held at the site to review and discuss all aspects of the project with the landscape contractor and/or owner.

A consultant will supervise plan implementation during construction to ensure that objectives and specifications of the restoration plan are met. Any necessary significant modifications to the design that occur because of unforeseen site conditions will be jointly approved by the City of Puyallup and the consultant prior to their implementation.

#### **4.3 Monitoring Methodology**

The monitoring program will be conducted for a period of five years, with annual reports submitted to the City. Vegetation monitoring will include general appearance, health, mortality, colonization rates, percent cover, percent survival, volunteer plant species, and invasive weeds.

Photo-points will be established from which photographs will be taken throughout the monitoring period. These photographs will document general appearance and progress in plant community establishment in the restoration area. Review of the photos over time will provide a visual representation of the success of the plan.

#### **4.4 Maintenance Plan**

Maintenance will be conducted on a routine, year-round basis. Additional maintenance needs will be identified and addressed following periodic maintenance reviews. Routine removal and control of non-native and other invasive plants within the designated mitigation area shall be performed. Undesirable and weedy exotic plant species shall be maintained at levels below 10% total cover within the restoration area during the monitoring period.

Routine maintenance of planted trees and shrubs shall be performed. Measures include resetting plants to proper grades and upright positions. Tall grasses and other competitive weeds shall be weeded at the base of plants to prevent engulfment.

#### **4.5 Contingency Plan**

All dead plants will be replaced with the same species or an approved substitute species that meets the goal of the restoration plan. Plant material shall meet the same specifications as originally installed material. Replanting will not occur until after the reason for failure has been identified (e.g., moisture regime, poor plant stock, disease, shade/sun conditions, wildlife damage, etc.). Replanting shall be completed under the direction of the consultant, City of Puyallup, or the owner.

#### **4.6 As-Built Plan**

Following completion of construction activities, an as-built plan for the restoration area will be provided to the City of Puyallup. The plan will identify and describe any changes in relation to the original approved plan

#### **5.0 Qualifications**

As requested by Confluence, I have attached my qualifications to prepare this study in **Attachment C**. As defined in PMC 21.06.210(108) a *“Qualified professional” or “qualified consultant” shall mean a person with experience and training in the pertinent scientific discipline, and who is a qualified scientific expert with expertise appropriate for the relevant critical area subject in accordance with WAC 365-195-905(4). A qualified professional must have obtained a B.S. or B.A. or equivalent degree in biology, soil science, engineering, environmental studies, fisheries, geomorphology or related field, and two years of related work experience and meet the following criteria:*

*(a) A qualified professional for habitats or wetlands must have a degree in biology and professional experience related to the subject species;*

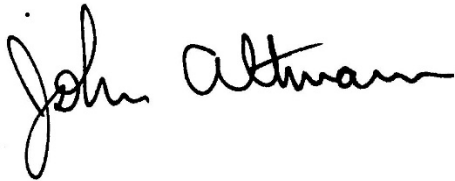
As a wetland ecologist with a degree In Natural Resource Management (Wildlife Science) and over 36 years of professional experience I meet the definition of qualified professional.

Sam Salo  
October 28, 2024  
Page **5** of **5**

If you have any questions, please give me a call.

Sincerely,

ALTMANN OLIVER ASSOCIATES, LLC

A handwritten signature in black ink that reads "John Altmann". The signature is written in a cursive style with a large, looped "J" and a long, sweeping underline.

John Altmann  
Ecologist

Attachments



# Vicinity Map

City of Puyallup  
Parcel 042022-2008

Altmann Oliver Associates, LLC

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AOA-6739

## Figure 1



Subject Property Parcel: 042022-2008

— Roads

— Hydro\_Centerlines

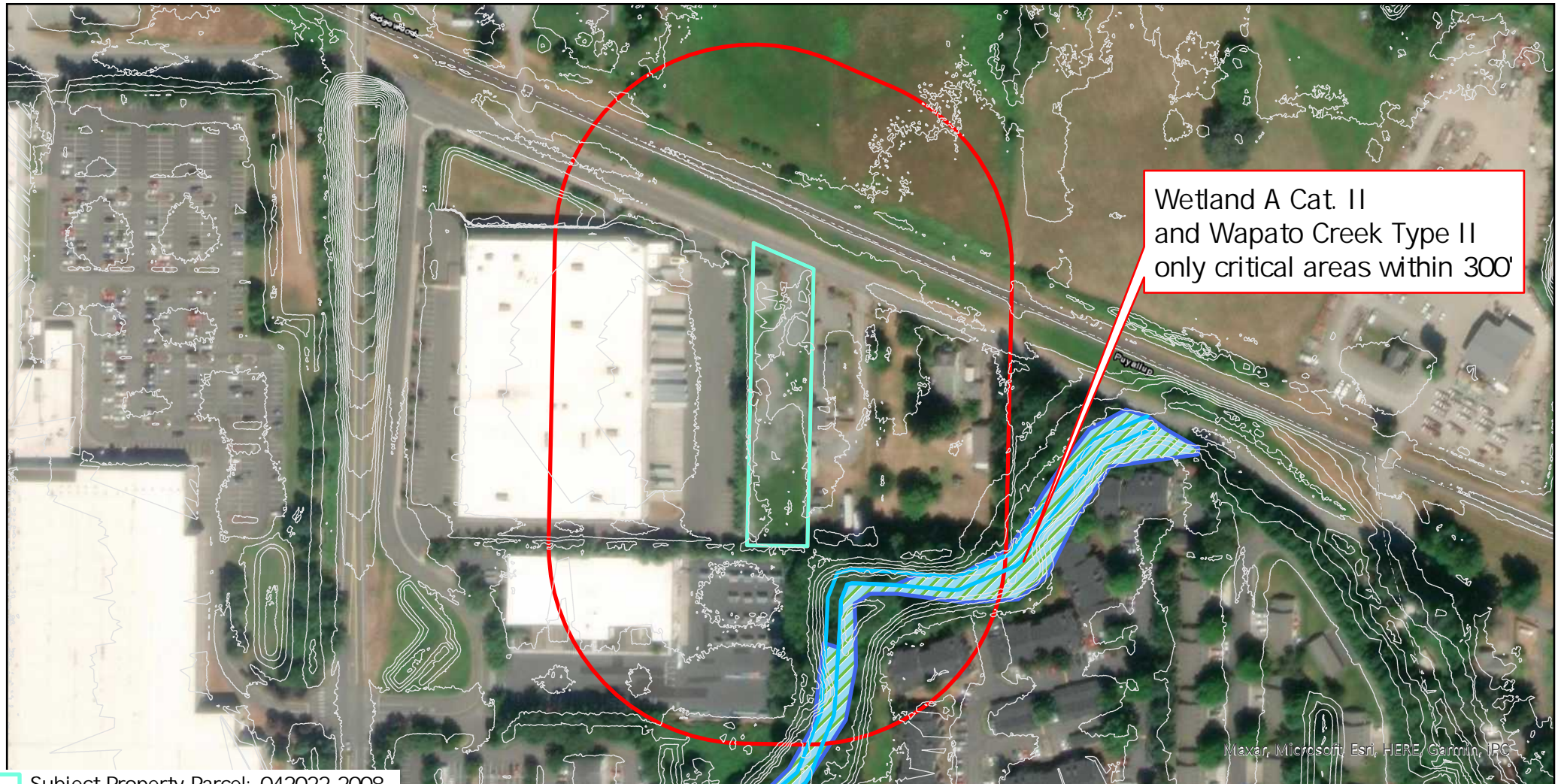
0 500 1,000 2,000 3,000 4,000  
US Feet



City of Puyallup  
Parcel 042022-2008

AOA-6739

# Figure 2



- Subject Property Parcel: 042022-2008
- Approximate Wapato Creek Type II
- 300' Critical Area Assessment Boundary
- Approximate Wetland A Cat. II

0    85    170    340    510    680  
US Feet



Very Limited  
Access

Altmann Oliver Associates, LLC

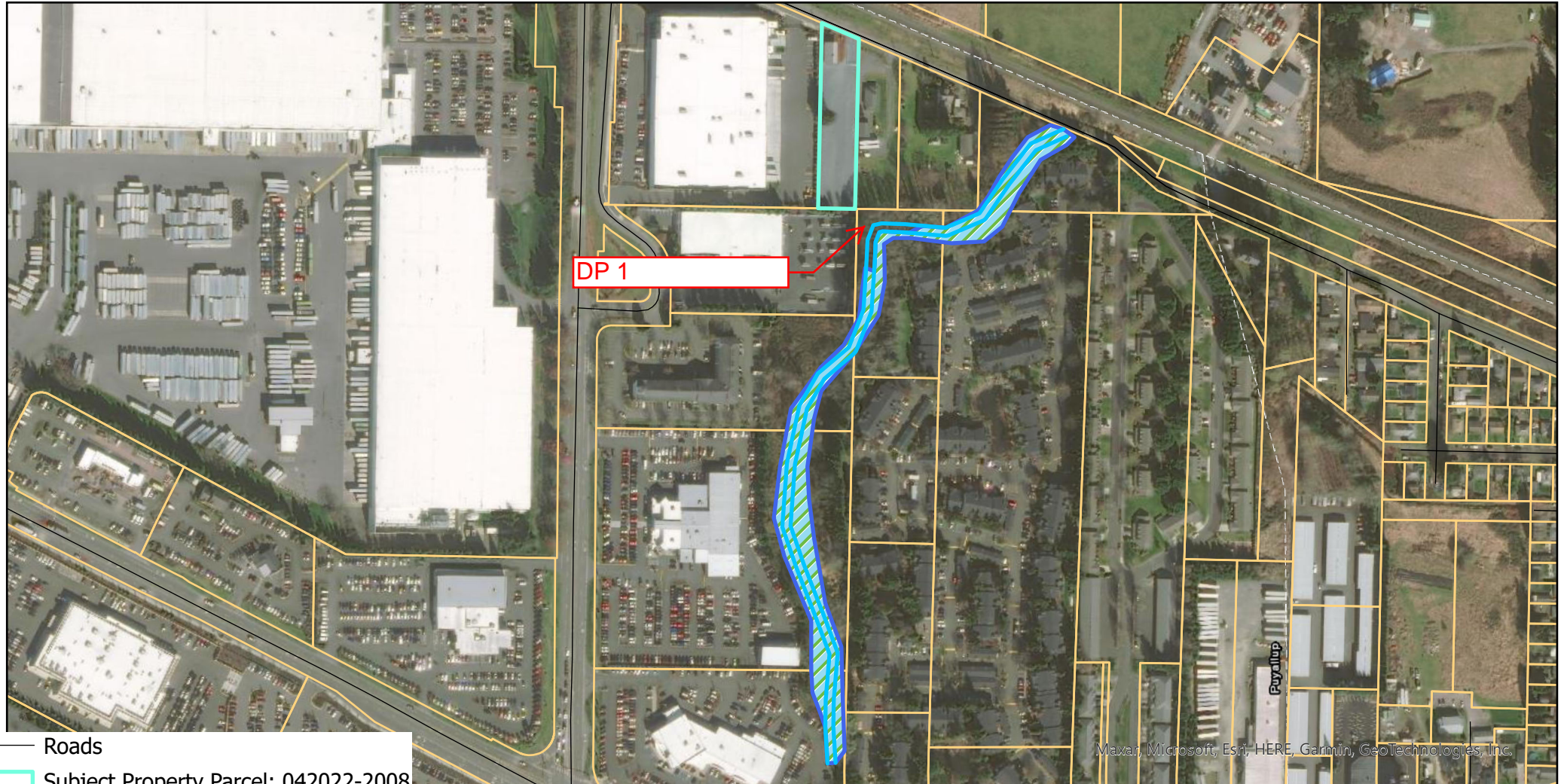
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City of Puyallup  
Parcel 042022-2008

AOA-6739

# Critical Areas Map



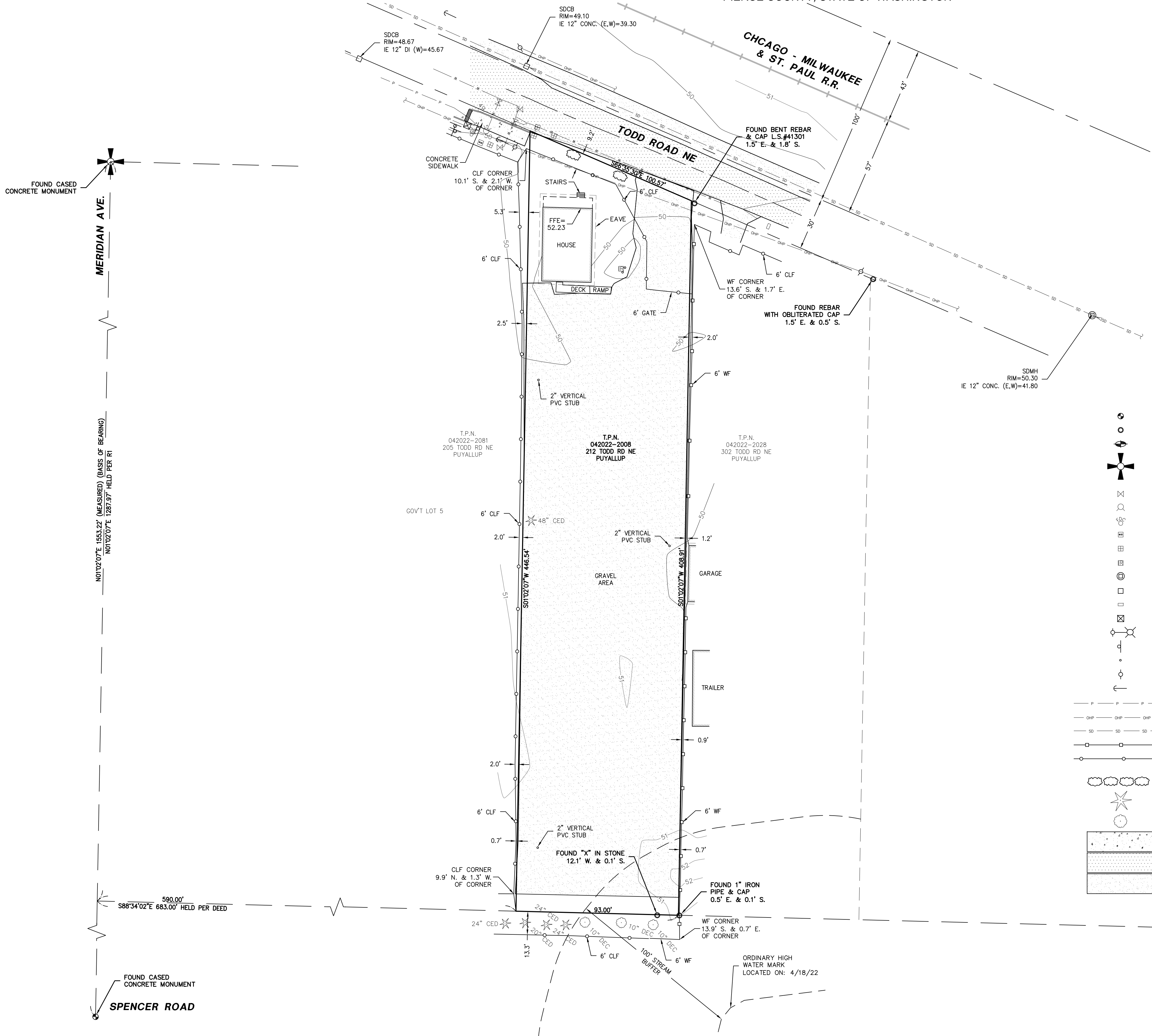
- Roads
- Subject Property Parcel: 042022-2008
- Approximate Stream
- Approximate Wetland A
- Tax\_Parcels

0 140 280 560 840 1,120 US Feet



AMERICAN PRIDE LENDING, LLC

A PORTION OF THE NW 1/4 OF THE NW 1/4 OF SEC. 22, T 20 N., R 04 E., W.M.  
PIERCE COUNTY, STATE OF WASHINGTON



LEGEND

- FOUND MONUMENT IN CASE
- FOUND REBAR & CAP
- BENCHMARK
- SECTION CORNER
- WATER VALVE
- FIRE HYDRANT
- FIRE DEPARTMENT CONNECTION
- WATER VALVE BOX
- WATER METER
- IRRIGATION CONTROL VALVE
- STORM MANHOLE
- CATCH BASIN
- MAILBOX
- JUNCTION BOX
- LIGHT POLE
- SIGN POST
- POST
- UTILITY POLE
- GUY ANCHOR
- UNDERGROUND POWER LINE
- OVERHEAD POWER LINE
- STORM LINE
- WOOD FENCE (WF)
- CHAIN LINK FENCE (CLF)
- HEDGE LINE
- EVERGREEN TREE
- DECIDUOUS TREE
- CONCRETE
- ASPHALT
- GRAVEL

TAX PARCEL

042022-2008

VERTICAL DATUM

NAVD 88

BENCHMARK

HELD CITY OF PUYALLUP BENCHMARK NW-TODD 7  
CONVERTED NGVD 29 ELEVATION OF 39.68' TO NAVD 88  
ELEVATION OF 43.17 BY ADDING THE 3.49' PER CORPSCON  
DATA CONVERSION SOFTWARE

HORIZONTAL DATUM

NAD 83/(2011) WASHINGTON SOUTH ZONE PER THE  
WASHINGTON STATE REFERENCE NETWORK - CHECKED TO  
PIERCE COUNTY REFERENCE NETWORK VIA TIES TO FOUND  
MONUMENTS SM 3572 AND SM 3662

BASIS OF BEARINGS

HELD A BEARING OF S 01°02'07" W ALONG THE WEST LINE  
OF GOV'T LOT 5 FROM THE FOUND MONUMENT AT THE NW  
CORNER THEREOF TO A MONUMENT LOCATED ALONG THE  
EXTENSION OF SAID WEST LINE LOCATED AT THE CENTER OF  
INTERSECTION OF MERIDIAN AVE AND SPENCER RD E

INSTRUMENTATION

INSTRUMENT USED: 5 SECOND TOTAL STATION.

FIELD SURVEY WAS BY CLOSED TRAVERSE LOOPS, MINIMUM  
CLOSURE OF LOOPS WAS 1:22,000, IN ACCORDANCE WITH  
WAC 332-130-090.

LEGAL DESCRIPTION

BEGINNING AT A POINT 683 FEET EAST OF THE SOUTHWEST  
CORNER OF LOT 5 IN SECTION 22, TOWNSHIP 20 NORTH,  
RANGE 4 EAST OF THE WILLAMETTE MERIDIAN;  
THENCE NORTH PARALLEL WITH THE WEST BOUNDARY OF  
SAID LOT, 442 FEET MORE OR LESS TO THE RIGHT OF WAY  
OF CHICAGO, MILWAUKEE & ST PAUL RAILWAY COMPANY;  
THENCE NORTHWESTERLY ALONG SAID RIGHT OF WAY 100  
FEET;  
THENCE SOUTH PARALLEL WITH AND 93 FEET DISTANCE  
FROM EAST BOUNDARY OF TRACT 478 FEET MORE OR LESS  
TO A POINT 93 FEET WEST OF THE POINT OF BEGINNING;  
THENCE EAST 93 FEET TO THE POINT OF BEGINNING.

EXCEPT THE NORTHERLY 15 FEET FOR TODD ROAD  
NORTHEAST.

SITUATE IN THE CITY OF PUYALLUP, COUNTY OF PIERCE,  
STATE OF WASHINGTON.

REFERENCES

ROS 201604295004 (R1)

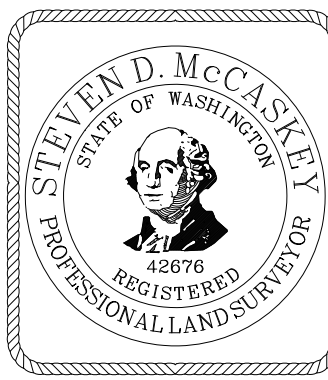
ROS 202012225005

ROS 9005230358

CHICAGO, MILWAUKEE AND ST PAUL RR NORTH PUYALLUP  
TRACK MAPS

REVISIONS

DESCRIPTION	BY	DATE



BOUNDARY TOPOGRAPHIC SURVEY

FOR  
AMERICAN PRIDE LENDING, LLC

Encompass  
ENGINEERING & SURVEYING

Western Washington Division  
165 NE Juniper Street, Suite 201 • Bellingham, WA 98207 • Phone: (425) 392-0230  
Eastern Washington Division  
407 Swiftwater Blvd. • Cle Elum, WA 98922 • Phone: (509) 674-7433

JOB NO.	21715
DATE	07/07/22
SCALE	1"=30'
DESIGNED	N/A
DRAWN	LFM
CHECKED	SDM
APPROVED	SDM

SHEET 1 OF 1

# **ATTACHMENT A**

## **DATA SHEETS**

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

Project Site: Parcel: 042022-2008 City/County: Puyallup/ Sampling Date: 6-23-22  
 Applicant/Owner: Sekhon State: WA Sampling Point: DP#1  
 Investigator(s): John Altmann Section, Township, Range: S22, T20N, R4E  
 Landform (hillslope, terrace, etc.): Slope Local relief (concave, convex, none): concave Slope (%):       
 Subregion (LRR): A Lat: 47.210042 Long: -122.290862 Datum: NAD83  
 Soil Map Unit Name: 31A NWI classification: PFO1C  
 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"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Wetland Hydrology Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Remarks: Upslope of OHW 1-2		

## VEGETATION – Use scientific names of plants

Tree Stratum (Plot size: 10')	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u><i>Alnus rubra</i></u>	<u>90</u>	<u>yes</u>	<u>FAC</u>	
2. <u><i>Pseudotsuga menziesii</i></u>	<u>10</u>	<u>no</u>	<u>FACU</u>	Total Number of Dominant Species Across All Strata: <u>5</u> (B)
3. <u>    </u>	<u>    </u>	<u>    </u>	<u>    </u>	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>40</u> (A/B)
4. <u>    </u>	<u>    </u>	<u>    </u>	<u>    </u>	
50% = <u>50</u> , 20% = <u>20</u>	<u>100</u>	= Total Cover		
Sapling/Shrub Stratum (Plot size: 10')				Prevalence Index worksheet:
1. <u><i>Ilex aquifolium</i></u>	<u>40</u>	<u>yes</u>	<u>FACU</u>	
2. <u><i>Oemleria cerasiformis</i></u>	<u>15</u>	<u>yes</u>	<u>FACU</u>	OBL species <u>    </u> x1 = <u>    </u>
3. <u><i>Corylus cornuta</i></u>	<u>10</u>	<u>no</u>	<u>FACU</u>	FACW species <u>    </u> x2 = <u>    </u>
4. <u><i>Rubus armeniacus</i></u>	<u>10</u>	<u>no</u>	<u>FAC</u>	FAC species <u>    </u> x3 = <u>    </u>
5. <u>    </u>	<u>    </u>	<u>    </u>	<u>    </u>	FACU species <u>    </u> x4 = <u>    </u>
50% = <u>37.5</u> , 20% = <u>15</u>	<u>75</u>	= Total Cover		UPL species <u>    </u> x5 = <u>    </u>
Herb Stratum (Plot size: 10')				Column Totals: <u>    </u> (A) <u>    </u> (B)
1. <u><i>Equisetum telmetia</i></u>	<u>30</u>	<u>yes</u>	<u>FACW</u>	Prevalence Index = B/A = <u>    </u>
2. <u>    </u>	<u>    </u>	<u>    </u>	<u>    </u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 – Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants <sup>1</sup> <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)  <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
3. <u>    </u>	<u>    </u>	<u>    </u>	<u>    </u>	
4. <u>    </u>	<u>    </u>	<u>    </u>	<u>    </u>	
5. <u>    </u>	<u>    </u>	<u>    </u>	<u>    </u>	
6. <u>    </u>	<u>    </u>	<u>    </u>	<u>    </u>	
7. <u>    </u>	<u>    </u>	<u>    </u>	<u>    </u>	
8. <u>    </u>	<u>    </u>	<u>    </u>	<u>    </u>	
9. <u>    </u>	<u>    </u>	<u>    </u>	<u>    </u>	
10. <u>    </u>	<u>    </u>	<u>    </u>	<u>    </u>	
11. <u>    </u>	<u>    </u>	<u>    </u>	<u>    </u>	
50% = <u>15</u> , 20% = <u>6</u>	<u>30</u>	= Total Cover		
Woody Vine Stratum (Plot size: 10')				Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
1. <u><i>Hedera helix</i></u>	<u>100</u>	<u>yes</u>	<u>FACU</u>	
2. <u>    </u>	<u>    </u>	<u>    </u>	<u>    </u>	
50% = <u>50</u> , 20% = <u>20</u>	<u>100</u>	= Total Cover		
% Bare Ground in Herb Stratum <u>    </u>				

Remarks:

**SOIL**Sampling Point: DP#1**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-15	10 YR 3/3	100	_____	_____	_____	_____	clay 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**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- ☐ Histosol (A1)  
☐ Histic Epipedon (A2)  
☐ Black Histic (A3)  
☐ Hydrogen Sulfide (A4)  
☐ Depleted Below Dark Surface (A11)  
☐ Thick Dark Surface (A12)  
☐ Sandy Mucky Mineral (S1)  
☐ Sandy Gleyed Matrix (S4)

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

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- ☐ 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 Soils Present?**Yes ☐ No ☒

Remarks:

**HYDROLOGY****Wetland Hydrology Indicators:**

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

- ☐ Surface Water (A1)  
☐ High Water Table (A2)  
☐ Saturation (A3)  
☐ Water Marks (B1)  
☐ Sediment Deposits (B2)  
☐ Drift Deposits (B3)  
☐ Algal Mat or Crust (B4)  
☐ Iron Deposits (B5)  
☐ Surface Soil Cracks (B6)  
☐ Inundation Visible on Aerial Imagery (B7)  
☐ Sparsely Vegetated Concave Surface (B8)

- ☐ Water-Stained Leaves (B9)  
**(except MLRA 1, 2, 4A, and 4B)**  
☐ Salt Crust (B11)  
☐ Aquatic Invertebrates (B13)  
☐ Hydrogen Sulfide Odor (C1)  
☐ Oxidized Rhizospheres along Living Roots (C3)  
☐ Presence of Reduced Iron (C4)  
☐ Recent Iron Reduction in Tilled Soils (C6)  
☐ Stunted or Stresses Plants (D1) **(LRR A)**  
☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

**Field Observations:**Surface Water Present? Yes ☐ No ☒ Depth (inches): \_\_\_\_\_Water Table Present? Yes ☐ No ☒ Depth (inches): \_\_\_\_\_Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): \_\_\_\_\_**Wetland Hydrology Present?** Yes ☐ No ☒

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

Remarks: Dry

# **ATTACHMENT B**

# **WETLAND RATING**

# RATING SUMMARY – Western Washington

Name of wetland (or ID #): Parcel 0420222008 Date of site visit: 3/1/2022Rated by Altmann Trained by Ecology? ☒ Yes ☐ No Date of training 03/08 & 03/15HGM Class used for rating Riverine & Fresh Water Tidal Wetland has multiple HGM classes? ☐ Yes ☒ No**NOTE: Form is not complete with out the figures requested** (*figures can be combined*).Source of base aerial photo/map Pierce County GISOVERALL 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>List appropriate rating (H, M, L)</i>				
Site Potential	M	M	M	
Landscape Potential	M	H	L	
Value	H	H	H	<b>Total</b>
<b>Score Based on Ratings</b>	7	8	6	<b>21</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	
Wetland of High Conservation Value	
Bog	
Mature Forest	
Old Growth Forest	
Coastal Lagoon	
Interdunal	
None of the above	<b>X</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	B
Hydroperiods	H 1.2	B
Ponded depressions	R 1.1	B
Boundary of area within 150 ft of the wetland ( <i>can be added to another figure</i> )	R 2.4	B
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	B
Width of unit vs. width of stream ( <i>can be added to another figure</i> )	R 4.1	B
Map of the contributing basin	R 2.2, R 2.3, R 5.2	E
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	A
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	C
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	D

### 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 another figure</i> )	S 4.1	
Boundary of area within 150 ft of the wetland ( <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	

## HGM Classification of Wetland in Western Washington

For questions 1 -7, the criteria described must apply to the entire unit being rated.

If hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1 - 7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

☒ NO - go to 2

☐ YES - the wetland class is **Tidal Fringe** - go to 1.1

1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

☐ NO - **Saltwater Tidal Fringe (Estuarine)**

☐ YES - **Freshwater Tidal Fringe**

*If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.*

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it.

Groundwater and surface water runoff are NOT sources of water to the unit.

☒ NO - go to 3

☐ YES - The wetland class is **Flats**

*If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.*

3. Does the entire wetland unit **meet all** of the following criteria?

☐ The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size;

☐ At least 30% of the open water area is deeper than 6.6 ft (2 m).

☒ NO - go to 4

☐ YES - The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. Does the entire wetland unit **meet all** of the following criteria?

☐ The wetland is on a slope (*slope can be very gradual*),

☐ The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.

☐ The water leaves the wetland **without being impounded**.

☒ NO - go to 5

☐ YES - The wetland class is **Slope**

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

5. Does the entire wetland unit **meet all** of the following criteria?

☒ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,

☒ The overbank flooding occurs at least once every 2 years.

☐ NO - go to 6

☒ YES - The wetland class is **Riverine**

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

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.*

NOTES and FIELD OBSERVATIONS:

**RIVERINE AND FRESHWATER TIDAL FRINGE WETLANDS****Water Quality Functions** - Indicators that the site functions to improve water quality

R 1.0. Does the site have the potential to improve water quality?

R 1.1. Area of surface depressions within the Riverine wetland that can trap sediments during a flooding event:

Depressions cover $> \frac{3}{4}$ area of wetland	points = 8	2
Depressions cover $> \frac{1}{2}$ area of wetland	points = 4	
Depressions present but cover $< \frac{1}{2}$ area of wetland	points = 2	
No depressions present	points = 0	

R 1.2. Structure of plants in the wetland (areas with  $> 90\%$  cover at person height, **not** Cowardin classes)

Trees or shrubs $> \frac{2}{3}$ area of the wetland	points = 8	8
<input type="checkbox"/> Trees or shrubs $> \frac{1}{3}$ area of the wetland	points = 6	
<input type="checkbox"/> Herbaceous plants ( $> 6$ in high) $> \frac{2}{3}$ area of the wetland	points = 6	
Herbaceous plants ( $> 6$ in high) $> \frac{1}{3}$ area of the wetland	points = 3	
Trees, shrubs, and ungrazed herbaceous $< \frac{1}{3}$ area of the wetland	points = 0	

Total for R 1

Add the points in the boxes above

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

R 2.0. Does the landscape have the potential to support the water quality function of the site?

R 2.1. Is the wetland within an incorporated city or within its UGA? Yes = 2 No = 0 2

R 2.2. Does the contributing basin to the wetland include a UGA or incorporated area? Yes = 1 No = 0 1

R 2.3. Does at least 10% of the contributing basin contain tilled fields, pastures, or forests that have been clearcut within the last 5 years? Yes = 1 No = 0 0

R 2.4. Is  $> 10\%$  of the area within 150 ft of the wetland in land uses that generate pollutants? Yes = 1 No = 0 1R 2.5. Are there other sources of pollutants coming into the wetland that are not listed in questions R 2.1 - R 2.4?  
Other Sources Yes = 1 No = 0 0

Total for R 2

Add the points in the boxes above

**4****Rating of Landscape Potential** If score is: ☒ 3 - 6 = H ☐ 1 or 2 = M ☐ 0 = L Record the rating on the first page

R 3.0. Is the water quality improvement provided by the site valuable to society?

R 3.1. Is the wetland along a stream or river that is on the 303(d) list or on a tributary that drains to one within 1 mi? Yes = 1 No = 0 1

R 3.2. Is the wetland along a stream or river that has TMDL limits for nutrients, toxics, or pathogens? Yes = 1 No = 0 1

R 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? (answer YES if there is a TMDL for the drainage in which the unit is found) Yes = 2 No = 0 0

Total for R 3

Add the points in the boxes above

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

**RIVERINE AND FRESHWATER TIDAL FRINGE WETLANDS****Hydrologic Functions** - Indicators that site functions to reduce flooding and stream erosion

R 4.0. Does the site have the potential to reduce flooding and erosion?		
R 4.1. Characteristics of the overbank storage the wetland provides: <i>Estimate the average width of the wetland perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (average width of wetland)/(average width of stream between banks).</i>		2
If the ratio is more than 20	points = 9	
If the ratio is 10 - 20	points = 6	
If the ratio is 5 - < 10	points = 4	
If the ratio is 1 - < 5	points = 2	
If the ratio is < 1	points = 1	
R 4.2. Characteristics of plants that slow down water velocities during floods: <i>Treat large woody debris as forest or shrub. Choose the points appropriate for the best description (polygons need to have &gt;90% cover at person height. These are <u>NOT</u> Cowardin classes).</i>		7
Forest or shrub for > $\frac{1}{3}$ area OR emergent plants > $\frac{2}{3}$ area	points = 7	
Forest or shrub for > $\frac{1}{10}$ area OR emergent plants > $\frac{1}{3}$ area	points = 4	
Plants do not meet above criteria	points = 0	
Total for R 4		9

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

R 5.0. Does the landscape have the potential to support the hydrologic functions of the site?		
R 5.1. Is the stream or river adjacent to the wetland downcut?	Yes = 0 No = 1	1
R 5.2. Does the up-gradient watershed include a UGA or incorporated area?	Yes = 1 No = 0	1
R 5.3 Is the up-gradient stream or river controlled by dams?	Yes = 0 No = 1	1
Total for R 5		3

**Rating of Landscape Potential** If score is: ☒ 3 = H ☐ 1 or 2 = M ☐ 0 = L Record the rating on the first page

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

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

**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.*

- |  |                                  |   |
|--|----------------------------------|---|
| <input type="checkbox"/> Aquatic bed   | 4 structures or more: points = 4 | 1 |
| <input type="checkbox"/> Emergent  | 3 structures: points = 2         |   |
| <input type="checkbox"/> Scrub-shrub (areas where shrubs have > 30% cover)   | 2 structures: points = 1         |   |
| <input checked="" type="checkbox"/> Forested (areas where trees have > 30% cover)  | 1 structure: points = 0          |   |
| <i>If the unit has a Forested class, check if:</i>   |                                  |   |
| <input checked="" type="checkbox"/> 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 |                                  |   |

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*).

- |   |                                     |                 |
|---|-------------------------------------|-----------------|
| <input type="checkbox"/> Permanently flooded or inundated   | 4 or more types present: points = 3 | 1               |
| <input type="checkbox"/> Seasonally flooded or inundated  | 3 types present: points = 2         |                 |
| <input checked="" type="checkbox"/> Occasionally flooded or inundated                                   | 2 types present: points = 1         |                 |
| <input type="checkbox"/> Saturated only   | 1 types present: points = 0         |                 |
| <input checked="" type="checkbox"/> Permanently flowing stream or river in, or adjacent to, the wetland |                                     |                 |
| <input type="checkbox"/> Seasonally flowing stream in, or adjacent to, the wetland                      |                                     |                 |
| <input type="checkbox"/> <b>Lake Fringe wetland</b>   |                                     | <b>2 points</b> |
| <input type="checkbox"/> <b>Freshwater tidal wetland</b>  |                                     | <b>2 points</b> |

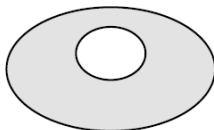
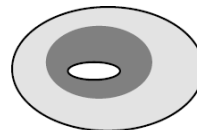
H 1.3. Richness of plant species

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 | 2 |
|                 | 5 - 19 species | points = 1 |   |
|                 | < 5 species    | points = 0 |   |

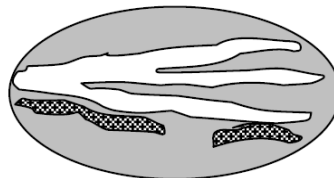
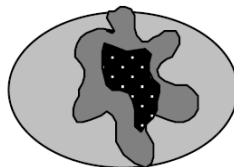
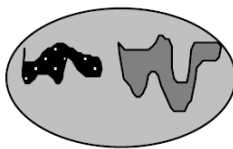
H 1.4. Interspersion of habitats

Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always high.*

**None** = 0 points**Low** = 1 point**Moderate** = 2 points

0

All three diagrams  
in this row are  
**HIGH** = 3 points



Wetland name or number A

<p><b>H 1.5. Special habitat features:</b>  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 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 (see H 1.1 for list of strata)</p>	3
<p><b>Total for H 1</b></p>	<p>Add the points in the boxes above</p> <p><b>7</b></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><b>H 2.0. Does the landscape have the potential to support the habitat function of the site?</b></p>	
<p><b>H 2.1 Accessible habitat</b> (include <i>only habitat that directly abuts wetland unit</i> ).  <b>Calculate:</b>  0.4 % undisturbed habitat + ( _____ 0 % moderate &amp; low intensity land uses / 2 ) = 0.4%</p> <p>If total accessible habitat is:</p> <p>&gt; 1/3 (33.3%) of 1 km Polygon points = 3</p> <p>20 - 33% of 1 km Polygon points = 2</p> <p>10 - 19% of 1 km Polygon points = 1</p> <p>&lt; 10 % of 1 km Polygon points = 0</p>	0
<p><b>H 2.2. Undisturbed habitat in 1 km Polygon around the wetland.</b>  <b>Calculate:</b>  0 % undisturbed habitat + ( _____ 18 % moderate &amp; low intensity land uses / 2 ) = 9%</p> <p>Undisturbed habitat &gt; 50% of Polygon points = 3</p> <p>Undisturbed habitat 10 - 50% and in 1-3 patches points = 2</p> <p>Undisturbed habitat 10 - 50% and &gt; 3 patches points = 1</p> <p>Undisturbed habitat &lt; 10% of 1 km Polygon points = 0</p>	0
<p><b>H 2.3 Land use intensity in 1 km Polygon:</b> If</p> <p>&gt; 50% of 1 km Polygon is high intensity land use points = (-2)</p> <p>≤ 50% of 1km Polygon is high intensity points = 0</p>	-2
<p><b>Total for H 2</b></p>	<p>Add the points in the boxes above</p> <p><b>-2</b></p>

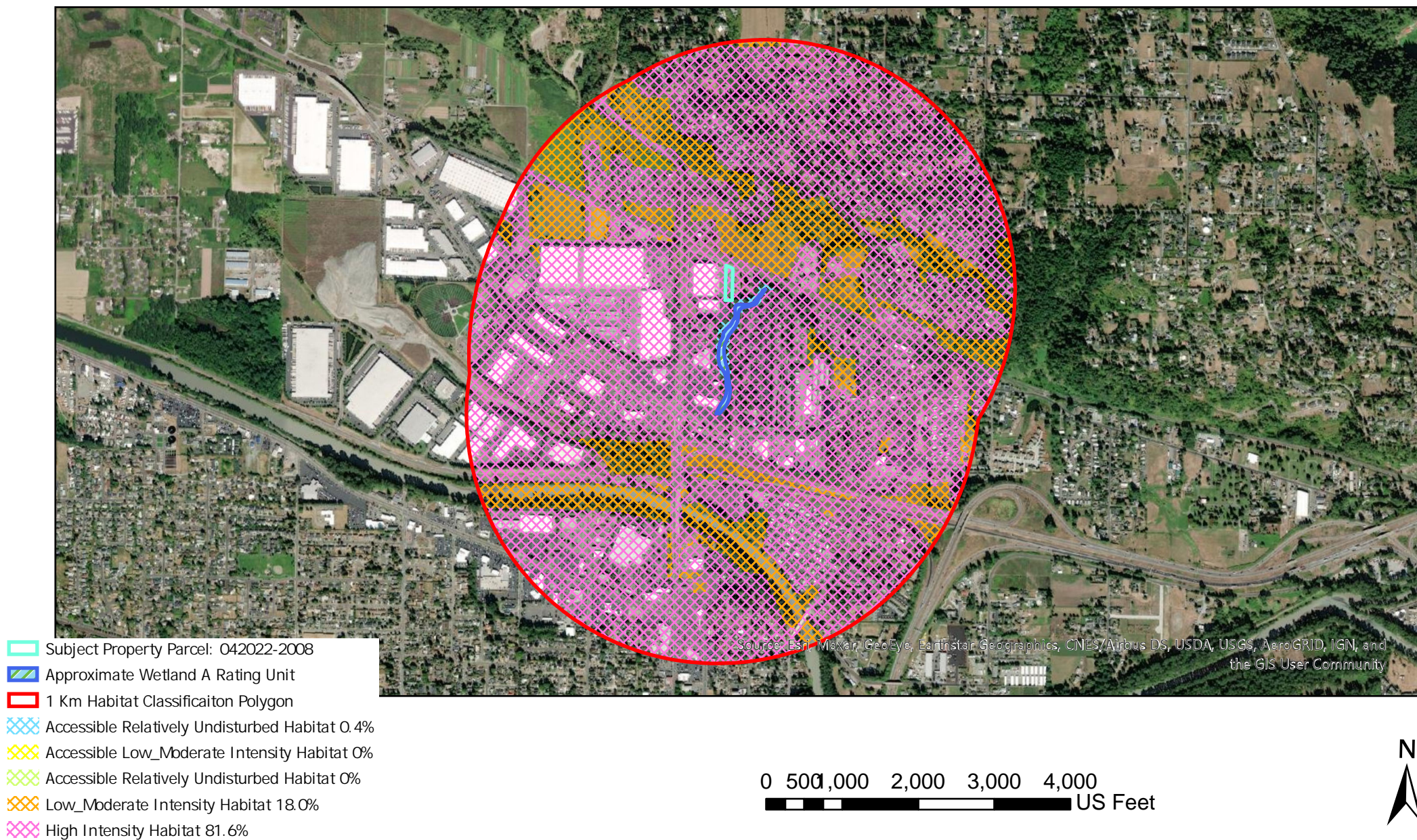
**Rating of Landscape Potential** If Score is: ☐ 4 - 6 = H ☐ 1 - 3 = M ☒ < 1 = L Record the rating on the first page

<p><b>H 3.0. Is the habitat provided by the site valuable to society?</b></p>	
<p><b>H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? Choose only the highest score that applies to the wetland being rated .</b></p> <p>Site meets ANY of the following criteria: points = 2</p> <p><input 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 checked="" 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) with in 100m points = 1</p> <p>Site does not meet any of the criteria above points = 0</p>	2

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

# Figure A

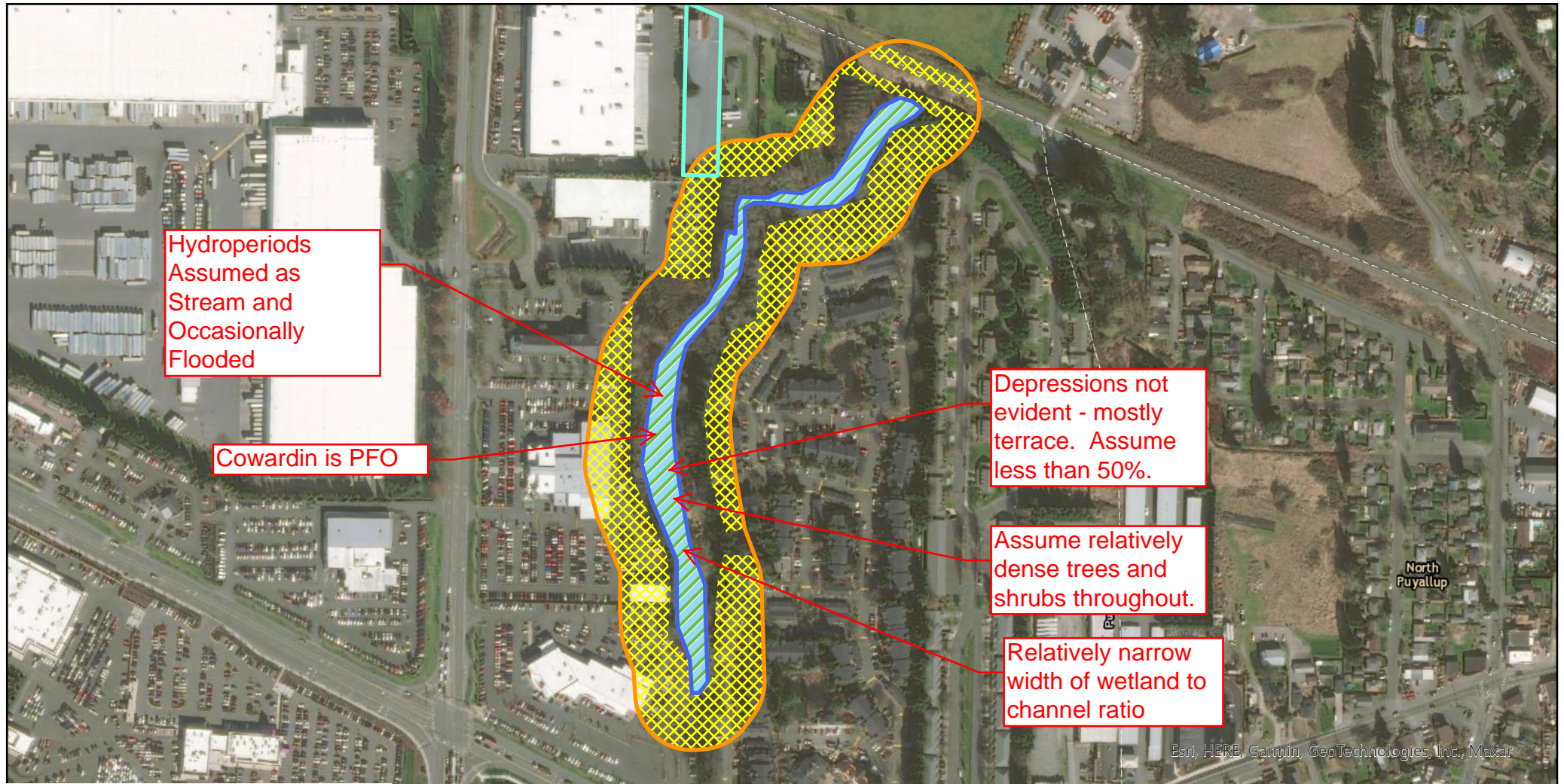
AOA - 6739



City of Puyallup  
Parcel 042022-2008

AOA-6739

# Figure B



 Subject Property Parcel: 042022-2008

 Approximate Wetland A

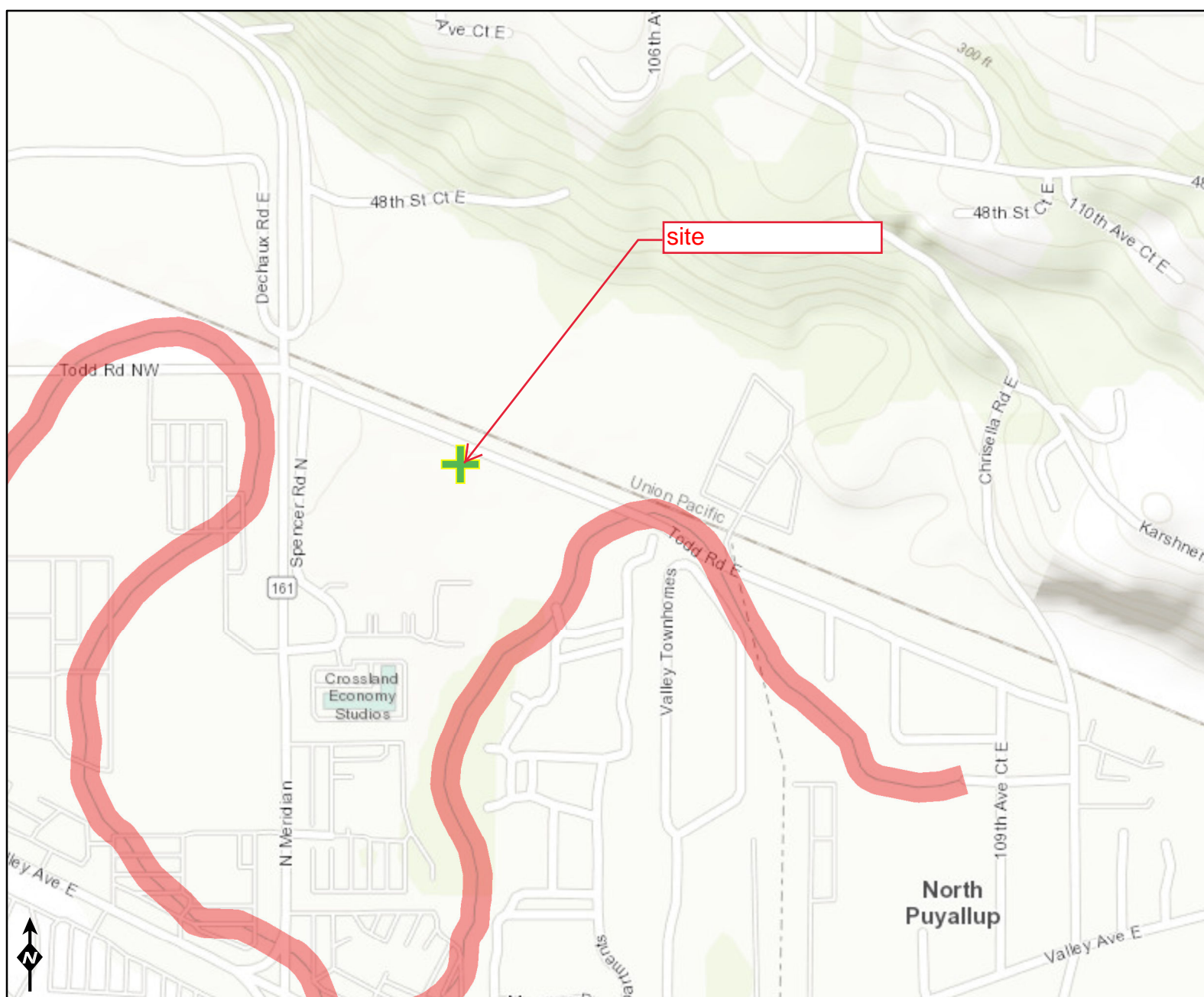
 150' Pollution Assessment Polygon


 Pollution Generating Surfaces 64.6%

0    150    300    600    900    1,200  
US Feet









## 6739 Figure C

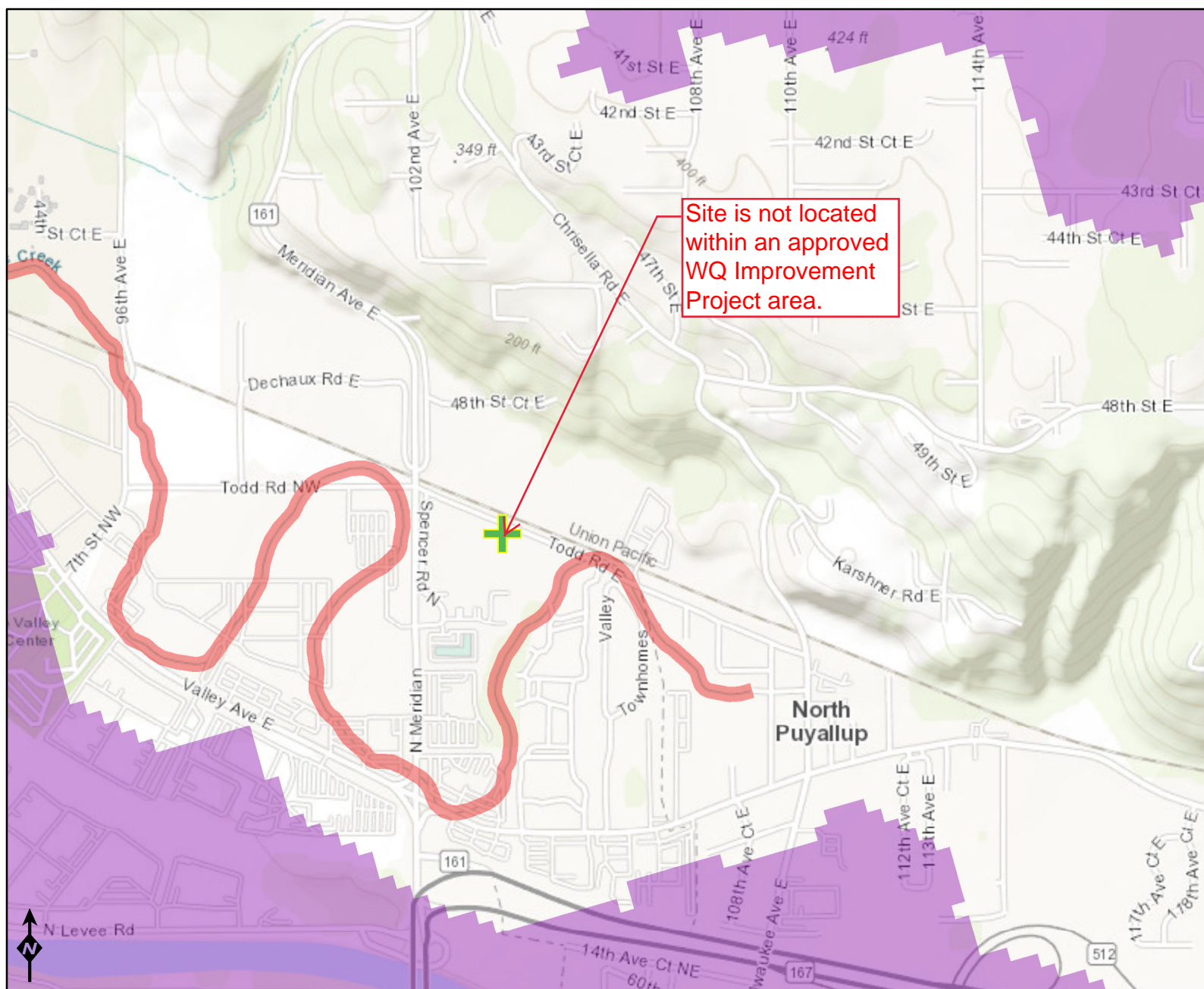
**Assessed Water/Sediment****Water**

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

**Sediment**

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

## 6739 Figure D

**Assessed Water/Sediment****Water**

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

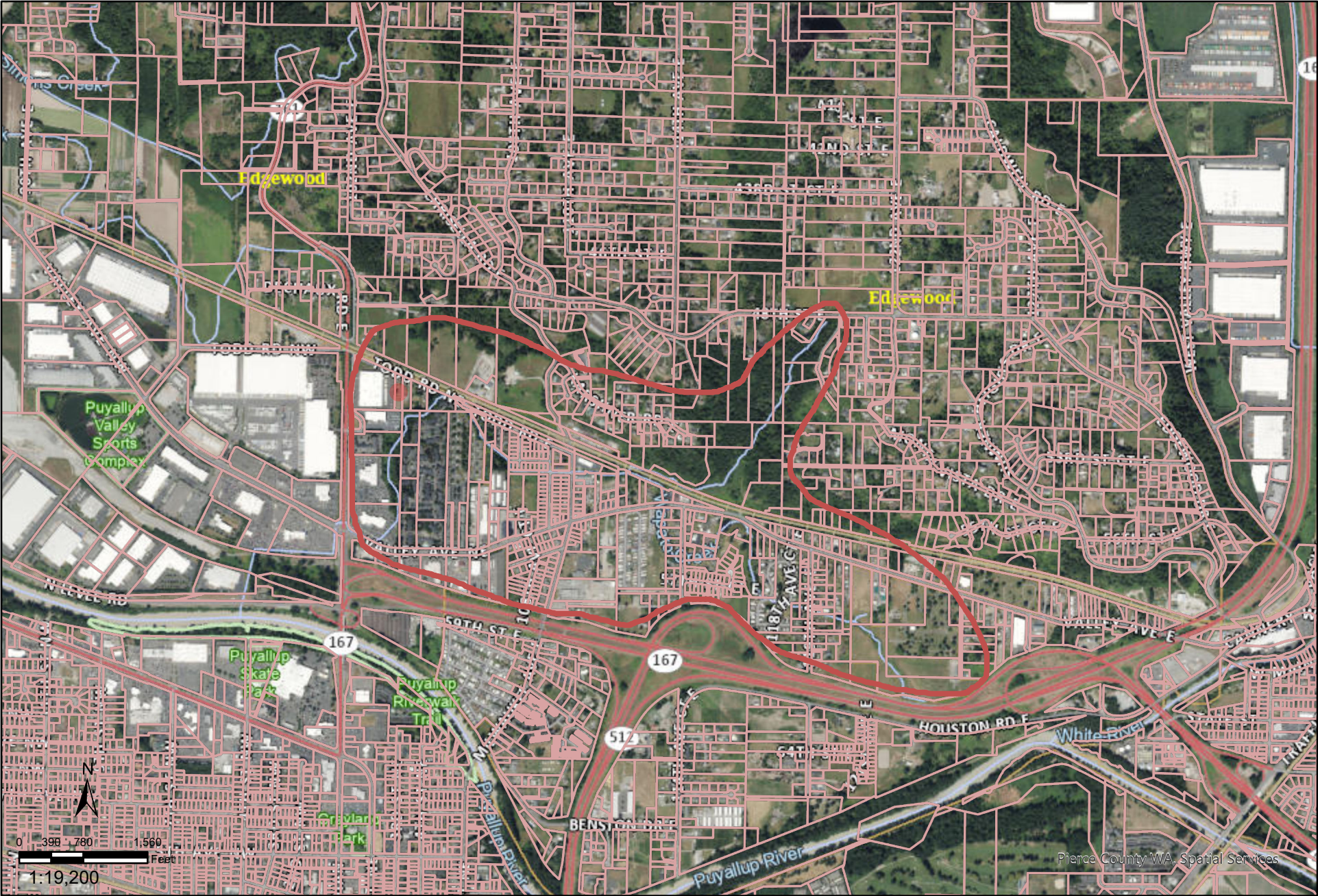
**Sediment**

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

**WQ Improvement Projects**

- Approved
- In Development

Figure E Rough Basin



Disclaimer: The map features are approximate and have not been surveyed. Additional features not yet mapped may be present.  
Pierce County assumes no liability for variations ascertained by formal survey.

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# AOA

Environmental  
Planning &  
Landscape  
Architecture



### JOHN J. ALTMANN, PRINCIPAL

Ecologist, Project Manager

*Wetland Delineations, Stream Studies, Functional Analysis, Mitigation, Environmental Impact Assessments, Planning, Regulatory Analysis & Permitting, Wildlife Studies*

### EXPERIENCE

Mr. Altmann has 36 years of experience working in resource and environmental planning, project management, and field analysis. His main area of concentration is wetlands and streams and his experience includes: delineations; environmental assessments; impact statements; mitigation plans; natural resource inventories and sensitivity analyses; site planning; and wildlife habitat management studies in Washington, Oregon, Idaho, Alaska, California, Wyoming, New Jersey, New York, and Pennsylvania.

### REPRESENTATIVE PROJECTS

Responsible for over 4,000 wetland and wildlife studies conducted in past 36 years, with most of these projects occurring in King, Snohomish, Skagit, Whatcom, Pierce, Thurston, Clark, Lewis, Kitsap, and Mason counties in Washington State. Most of these projects involved analysis of wetland and stream conditions in relation to some proposed construction activity that could potentially affect their functions and values. Many of the studies involved delineation only, whereas others required determination of wetland functions and values and wetland impact mitigation planning and other sensitive areas analyses. Project sizes ranged from under 1 acre to over 600 acres, with the wetlands on these properties being nearly as variable as their size. Wildlife studies include flora and fauna inventories, habitat impact assessments, and threatened and endangered species studies. Some of the projects representative of this experience are listed below.

***Shoreline Delineation & Habitat Assessment*** for private land owners on Lake Sammamish, Bellevue, WA

***Wetland Mitigation and Long-Term Monitoring*** for Weyerhaeuser Real Estate Development Company's Mint Farm Phase II project in the City of Longview, WA

***Stream Delineation Study, Mitigation Plan*** for the Greystone PRD, Redmond, WA

***Wetland Delineation and Study*** for the Group Health Support Facility in the City of Tukwila, WA

***Critical Areas Delineation, Study, and Mitigation Plan*** for the Cadman High Rock Quarry in Snohomish County, WA

***Critical Areas Delineations, Studies, and Mitigation Plans*** for the Microsoft Corporate Campus in the City of Redmond, WA

***Critical Areas Study, Mitigation Plan, Biological Assessment, and Long-Term Monitoring*** on 90-acre Northpointe Corporate Campus for OPUS NW in Snohomish County, WA  
***Wetland Delineation, Study, and Mitigation Plan*** for the Puyallup Downs Residential Development in the City of Puyallup, WA  
***Wildlife Study*** on 40-acre Site in North Bend Area of King County, WA for Private Developer  
***Critical Areas Delineation and Study*** for Data I/O Corporation in Redmond, WA for the Quadrant Corporation  
***Sensitive Areas Assessment*** for 74-acre Church site in Redmond, King County, WA  
***Wetland Delineation*** on 47-acre Marine Industrial Site Location in Snohomish River Estuary, Everett, Snohomish County, WA for Private Developer  
***Wetland Study and Mitigation Plan*** for 37-acre Office Park Site in Redmond, King County, WA for Private Developer  
***Wetland Maintenance and Monitoring Plan*** for Property on Raging River in King County, WA for Private Developer

## OTHER PROJECT EXPERIENCE

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- Wetland Biologist for the King County Parks, Planning and Resource Department, Environmental Division, Resource Planning Section. Mapped, classified, inventoried and rated the wetlands in the cities of Kirkland, Bothell, Normandy Park, Duvall, and Lake Forest Park for inclusion in the King County Sensitive Areas Folio.
- Research Assistant for the NJ Division of Fish, Game and Wildlife's Endangered and Nongame Species Program. Responsible for the research, feeding, and monitoring of osprey fledglings for 3 seasons of the NJ osprey hacking program. Responsible for the collection and analysis of information pertaining to population size and migration along with species density and behavior of shorebirds along the Delaware Bay.
- Research Assistant for the NJ Division of Fish, Game and Wildlife. Responsible for the collection, processing and analysis of biological information pertaining to the whitetail deer population in NJ.

## EDUCATION

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B.S., Natural Resource Management, Wildlife Science Option, Rutgers University, Cook College, New Brunswick, NJ.

## PROFESSIONAL MEMBERSHIPS

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Society of Wetland Scientists  
The Wildlife Society