

Wetland and Stream Investigation and Delineation Memorandum

To: City of Sumner
From: Widener & Associates, (425) 348-3059
Date: May 28, 2015
Subject: Salmon Springs Transmission Main Replacement Project

Authorizing Agency / Reason for the Investigation

On behalf of the City of Puyallup, Widener & Associates performed a wetland and stream investigation and delineation within a 4.5 acre study area associated with the proposed Salmon Springs Water Transmission Main Replacement Project in order to locate any wetlands, streams, or regulated buffers that could potentially be impacted by the proposed project.

Project Location

The project is located just north of the confluence of Salmon Tributary and Salmon Creek, starting at the existing chlorination compound approximately 0.1 mile upstream of this confluence. Salmon Tributary enters Salmon Creek at approximately river mile (RM) 0.5 of Salmon Creek. Salmon Tributary runs generally north to south through the project area. The proposed project is located just north of Downtown Sumner in Section 18 of Township 20N and Range 05E. *Refer to Figure 1- Vicinity Map and Figure 2 – Study Area.*

Project Description

The City of Puyallup is proposing to replace the existing Salmon Springs Water Transmission Main from just below the existing concrete dam to the existing chlorination compound in the City of Sumner, Pierce County, WA. This transmission main is the oldest and most important piece of infrastructure in the City of Puyallup's water system. It was originally constructed in 1906, with the portion just below the concrete dam replaced in 1997. In 2013, Salmon Springs provided nearly 63% of the City's water. Due to the age and critical nature of this transmission main, the City is proposing to construct a new transmission main from the spring source to the existing chlorination compound. This will be accomplished by tying into the 16-inch ductile iron pipe that was replaced in 1997, south of the concrete dam, and following the proposed alignment to the existing chlorination compound. The existing portion of the transmission main that will be bypassed will remain in place to maintain service during construction, to provide redundancy in case of a landslide or seismic event, and to minimize ground disturbance and vegetation removal in sensitive areas. One elevated stream crossing is proposed for the new transmission main, with a small bridge proposed just upstream of the crossing to provide construction and maintenance access for the new alignment. No in-water work or wetland impacts are proposed for this project.

Site Description

The proposed project is located adjacent to and over Salmon Tributary, a spring-fed tributary of Salmon Creek. In addition, there is a Category III palustrine seepage wetland (Wetland A) that was also identified and delineated within the study area (Figure 3). Both of these features are considered "Waters of the United States" and are thus regulated by the U.S. Army Corps of Engineers (USACE) under the Clean Water Act.¹

¹ 33 CFR 328.3(a)

The entire proposed project occurs within the limits of property owned by the City of Puyallup; however, the project is within the city limits of the City of Sumner and is therefore subject to the City of Sumner's critical areas regulations. According to City of Sumner mapping, the project area is within parcels zoned as Low Density Residential 12000 (LDR-12)² and within an area designated as Public-Private Utilities & Facilities according to the City of Sumner's Comprehensive Plan.³

The proposed project area is located within the steep west-facing slope situated between Lake Tapps and the Kent-Auburn Valley. Elevation of the site varies from 80 ft. at the existing chlorination compound to 210 ft. just below the existing concrete dam. Much of the project vicinity is characterized by shallow groundwater that is the result of groundwater seeps in the area. A natural upland levee separates most of Wetland A from the OHWM of Salmon Tributary. Much of the proposed alignment will follow this levee in order to avoid impacts to the creek or the adjacent wetland.

Date of Visit

Widener & Associates conducted this investigation and delineation on April 8th of 2015.

Methods

A routine determination with onsite inspection was used to determine if any wetlands were present within the project footprint.⁴ Prior to the field investigation, wetland maps and hydrology data were reviewed. Site conditions (vegetation, hydrology, and soils) were recorded throughout the site. Refer to Appendix A – Wetland Determination Data Forms.

Vegetative Communities

The study area is located within the *Tsuga heterophylla* major vegetation area.⁵ The proposed project area is characterized by an overstory of red alder (*Alnus rubra*), western red cedar (*Thuja plicata*), and bigleaf maple (*Acer macrophyllum*) with a shrub layer dominated by Indian plum (*Oemleria cerasiformis*), salmonberry (*Rubus spectabilis*), Himalayan blackberry (*Rubus armeniacus*), red-osier dogwood (*Cornus sericea*), vine maple (*Acer circinatum*), English holly (*Ilex aquifolium*), red elderberry (*Sambucus racemosa*), and devil's club (*Oplopanax horridus*). The herbaceous layer within the upland levee and surrounding upland slopes is dominated by Pacific waterleaf (*Hydrophyllum tenuipes*), Pacific bleeding heart (*Dicentra formosa*), stinging nettle (*Urtica dioica*), and western sword fern (*Polystichum munitum*) while the herbaceous layer within the delineated seepage wetland is dominated by watercress (*Nasturtium officinale*), water parsley (*Oenanthe sarmentosa*), lady fern (*Athyrium filix-femina*), horsetail (*equisetum spp.*), creeping buttercup (*Ranunculus repens*), reed canarygrass (*Phalaris arundinacea*), and skunk cabbage (*Lysichiton americanus*).

Soils

The Pierce County Area soil survey indicates that soils within the study area are mapped completely as Xerochrepts, 45 to 70% slopes. This soil type is characterized by deep gravelly sandy loam that

² City of Sumner. 2014a. City of Sumner Zoning Map. City of Sumner Community Development Department. Adopted September 15, 2014. Accessed April 7, 2015.

³ City of Sumner. 2014b. City of Sumner Comprehensive Plan Map. City of Sumner Community Development Department. Adopted September 15, 2014. Accessed April 7, 2015.

⁴ Army Corps of Engineers. 1987. Wetland Delineation Manual Part 4, section D, subsection 2

⁵ Franklin JF and Dyrness CT. 1973. Natural Vegetation of Oregon and Washington. Oregon State University Press, Corvallis, OR.

formed from sandy and gravelly outwash and/or glacial till on valley sides.⁶ The upper layer of soil contains a significant amount of loose gravel and stream cobbles. *Refer to Appendix B – NRCS Soil Data.*

Within Wetland A, soil was found to be dark (low chroma/depleted) mucky sandy gravelly loam. Soil in Wetland A satisfied hydric soil indicator F1 (loamy mucky mineral).

Hydrology

The growing season in Sumner, WA is 234 days in length, from March 22 to November 11 (using the 5 years in 10 criteria and 28°F).⁷ Therefore, the area must be inundated or saturated to the surface for a minimum of 12 consecutive days in order to have wetland hydrology 5 percent of the growing season (29 days to have wetland hydrology 12.5 percent of the growing season). 3.72 inches of rain were recorded during the month prior to the site visit, while no precipitation was recorded the day of the site visit. *Refer to Appendix C - Hydrologic Data.*

The primary sources of hydrology to the wetland were determined to be precipitation and groundwater, with groundwater seepage from Salmon Springs being the primary hydrological contributor to the wetland. Test pits were excavated to a depth of 20 inches. Shallow inundation and surface saturation were observed in Wetland A at the time of the delineation, and the water table was located 2 inches deep at Test Pit 5.

Wetland Findings/Conclusion

The National Wetlands Inventory (NWI) map and City of Sumner's 2007 Wetland Inventory Map for the area were referenced for information on known wetlands within the study area. No NWI wetlands are indicated within the study area; however, there is a small palustrine emergent wetland that coincides with the location of Salmon Springs, north of the proposed project area. Delineated Wetland A coincides with an area of wetland indicated on the City of Sumner's Wetland Inventory Map.⁸ *Refer to Appendix D – Existing Wetland Mapping.*

The boundary of Wetland A was delineated in order to determine its jurisdictional limits as well as the extent of its regulated buffer (Figure 3). Wetland A was rated as a Category III palustrine slope wetland according to the Washington State Wetland Rating System for Western Washington.⁹ *Refer to Appendix E – Wetland Rating Form.*

As a Category III wetland, Wetland A has a standard regulated buffer width of 75 feet.¹⁰ Earth moving and vegetation removal within this standard buffer is regulated under the City of Sumner's Critical Areas Ordinance. Temporary and permanent clearing and excavation within this buffer will be required for trenching of the new transmission main alignment and the proposed access bridge. A Habitat Management and Mitigation Plan has been prepared in accordance with Sumner Municipal Code 16.56.080 that outlines the proposed mitigation for temporary and permanent impacts proposed within this regulated buffer.

⁶ Natural Resources Conservation Service. 2013. NRCS Web Soil Survey. US Department of Agriculture, Natural Resource Conservation Service. Accessed May 18, 2015.

⁷ Natural Resource Conservation Service. 2000. WETS Table Documentation. WETS Station 5224. National Water and Climate Center. Portland, Oregon. Accessed May 28, 2015.

⁸ City of Sumner. 2007. City of Sumner Wetland Inventory Map, 2007. City of Sumner Community Development Department. Accessed May 28, 2015.

⁹ Hruby, T. 2014. Washington State Wetland Rating System for Western Washington: 2014 Update. Publication #14-06-029. Olympia, WA: Washington Department of Ecology.

¹⁰ Sumner Municipal Code 16.46.150(A)

The ordinary high water mark (OHWM) of Salmon Tributary was also delineated to determine the jurisdictional limits of the creek as well as the extent of its regulated buffer (Figure 3). According to the Washington Department of Natural Resources (DNR) water typing map¹¹ and the City of Sumner's Fish and Wildlife Habitat Area Map¹², Salmon Tributary is listed as a Type 5 non-fish bearing water (formerly type N). However, data from WDFW¹³ and Puyallup Tribal Fisheries¹⁴ suggest that anadromous fish utilize up to the lower 700-foot reach of the creek. Therefore, Salmon Tributary would be more appropriately classified as a Type 3 fish-bearing water within the lower 700 feet of the creek where the gradient is low enough to allow spawning access. Above this point, the creek would more appropriately be classified as a Type 4 water as it has perennial flow.¹⁵ According to Sumner Municipal Code 16.56.100, Type 4 waters have a standard regulated buffer of 50 feet while Type 3 waters have a standard regulated buffer width of 100 feet. As permanent and temporary vegetation removal is required within these regulated buffers to construct along the proposed alignment, restoration of temporarily-disturbed stream buffer and additional buffer enhancement or preservation downstream along Salmon Creek is proposed in the Habitat Management and Mitigation Plan to mitigate for permanent and temporal loss of buffer functions in accordance with SMC 16.56.080.

¹¹ Washington State Department of Natural Resources. 2007. Forest Practices Application Review System. Accessed April 9, 2015.

¹² City of Sumner. 2003. City of Sumner Fish and Wildlife Habitat Area Map. City of Sumner Community Development Department. Printed November 13, 2003. Accessed April 9, 2015.

¹³ Washington Department of Fish and Wildlife. 2015. SalmonScape web mapping application. Accessed April 7, 2015.

¹⁴ Marks, E. L., R.C. Ladley, B.E. Smith, A.G. Berger, J.A. Paul, T.G. Sebastian and K. Williamson. 2014. 2013-2014 Annual Salmon, Steelhead, and Bull Trout Report: Puyallup/White River Watershed--Water Resource Inventory Area 10. Puyallup Tribal Fisheries, Puyallup, WA.

¹⁵ WAC 222-16-031

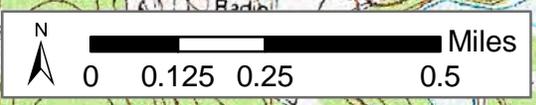
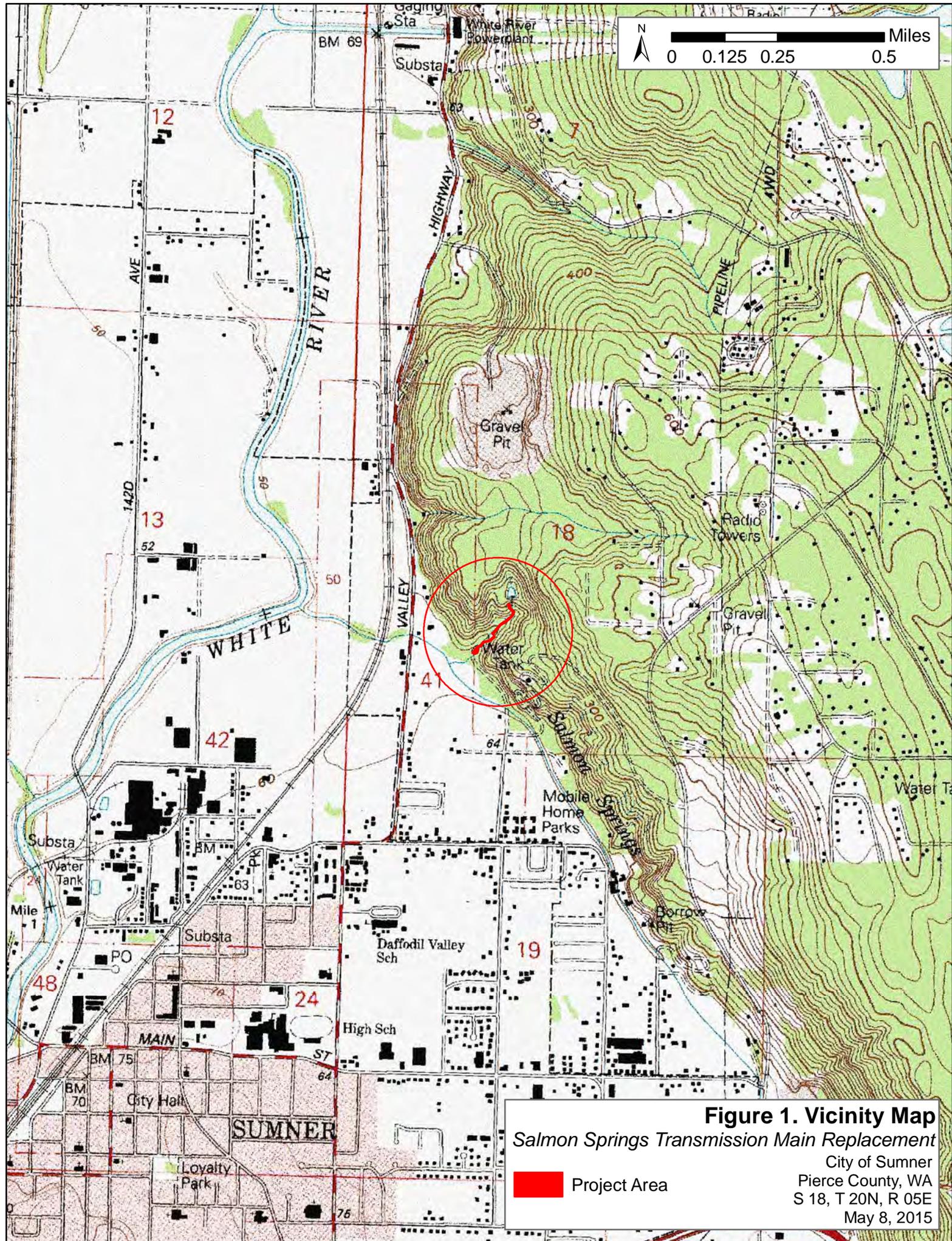
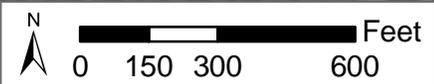


Figure 1. Vicinity Map
Salmon Springs Transmission Main Replacement
 City of Sumner
 Pierce County, WA
 S 18, T 20N, R 05E
 May 8, 2015

 Project Area

This page intentionally left blank for printing purposes.



E Valley Hwy



Figure 2. Study Area
Salmon Springs Transmission Main Replacement
City of Sumner
Pierce County, WA
S 18, T 20N, R 05E
May 28, 2015

 Study Area

This page intentionally left blank for printing purposes.

- Project Area
- Upland Test Pits
- Wetland Test Pits
- Wetland A
- Wetland A Buffer (75 ft.)
- Type 3 Stream OHW
- Type 3 Stream Buffer (100 ft.)
- Type 4 Stream OHW
- Type 4 Stream Buffer (50 ft.)

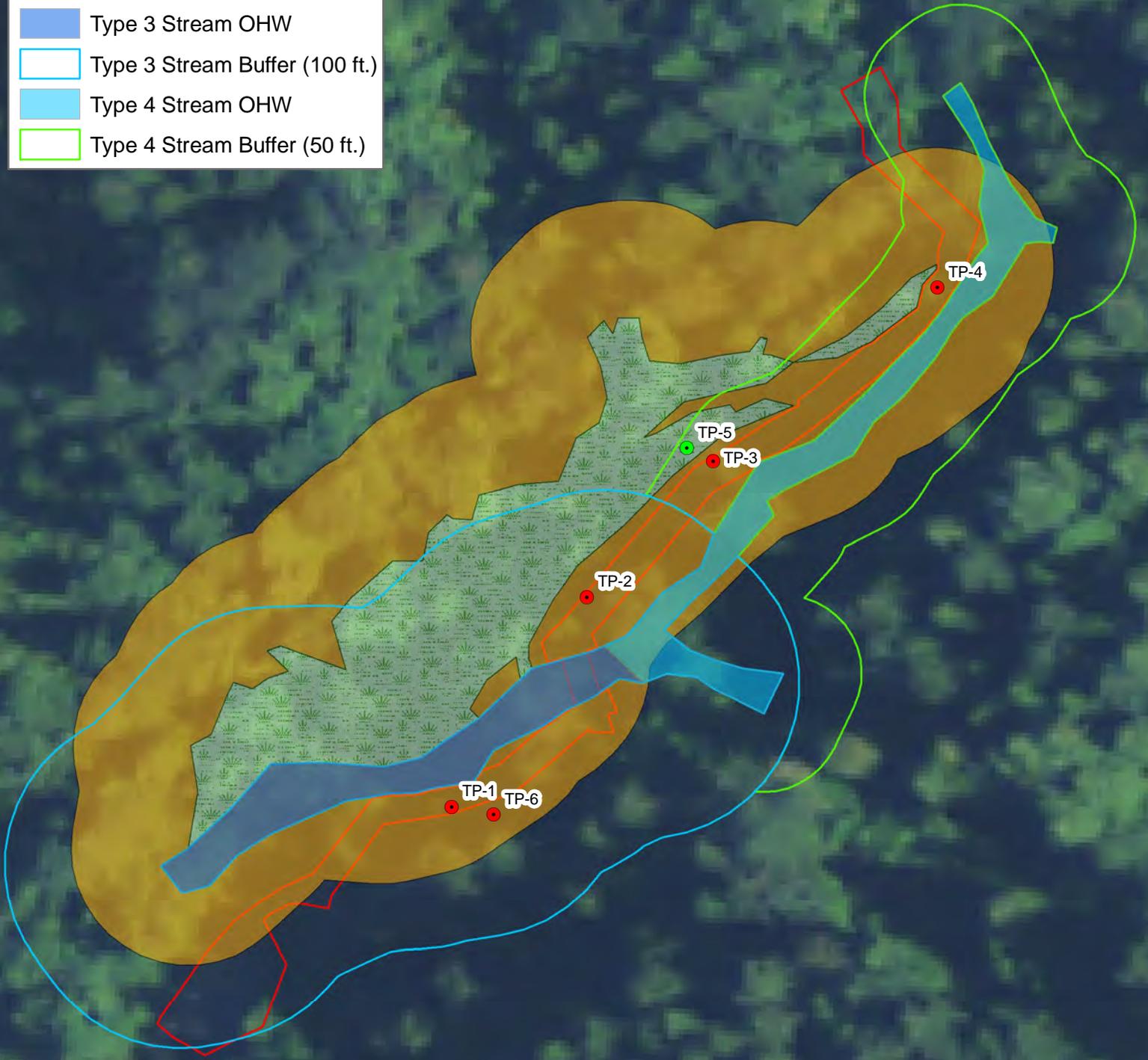
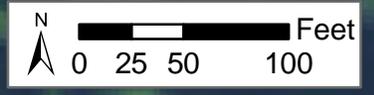


Figure 3. Delineated Critical Areas
Salmon Springs Transmission Main Replacement
 City of Sumner
 Pierce County, WA
 S 18, T 20N, R 05E
 May 28, 2015

This page intentionally left blank for printing purposes.

Appendix A – Wetland Determination Data Forms

This page intentionally left blank for printing purposes.

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

Project Site: Salmon Springs Transmission Main Replacement City/County: Sumner/Pierce Sampling Date: 4/8/15
 Applicant/Owner: City of Puyallup State: WA Sampling Point: TP-1
 Investigator(s): Jason Cade, Widener and Associates Section, Township, Range: 18, 20N, 05E
 Landform (hillslope, terrace, etc.): valley side Local relief (concave, convex, none): convex Slope (%): 2
 Subregion (LRR): A Lat: 47.217358 N Long: -122.222343 W Datum: NAD83
 Soil Map Unit Name: Xerochrepts, 45 to 70% slopes 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"/>	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"/>		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Remarks:					

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:																
1. <u><i>Alnus rubra</i></u>	<u>50</u>	<u>yes</u>	<u>FAC</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>66.7</u> (A/B)																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
50% = <u>1</u> , 20% = _____	<u>50</u>	= Total Cover		Prevalence Index worksheet: <table style="width: 100%; border: none;"> <tr> <td style="text-align: center;">Total % Cover of:</td> <td style="text-align: center;">Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x1 = _____</td> </tr> <tr> <td>FACW species _____</td> <td>x2 = _____</td> </tr> <tr> <td>FAC species _____</td> <td>x3 = _____</td> </tr> <tr> <td>FACU species _____</td> <td>x4 = _____</td> </tr> <tr> <td>UPL species _____</td> <td>x5 = _____</td> </tr> <tr> <td>Column Totals: _____ (A)</td> <td>_____ (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = _____</td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species _____	x1 = _____	FACW species _____	x2 = _____	FAC species _____	x3 = _____	FACU species _____	x4 = _____	UPL species _____	x5 = _____	Column Totals: _____ (A)	_____ (B)	Prevalence Index = B/A = _____	
Total % Cover of:	Multiply by:																			
OBL species _____	x1 = _____																			
FACW species _____	x2 = _____																			
FAC species _____	x3 = _____																			
FACU species _____	x4 = _____																			
UPL species _____	x5 = _____																			
Column Totals: _____ (A)	_____ (B)																			
Prevalence Index = B/A = _____																				
<u>Sapling/Shrub Stratum (Plot size: 15')</u>																				
1. <u><i>Rubus spectabilis</i></u>	<u>10</u>	<u>no</u>	<u>FAC</u>																	
2. <u><i>Sambucus racemosa</i></u>	<u>5</u>	<u>no</u>	<u>FACU</u>																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
50% = _____, 20% = _____	<u>15</u>	= Total Cover																		
<u>Herb Stratum (Plot size: 5')</u>																				
1. <u><i>Hydrophyllum tenuipes</i></u>	<u>40</u>	<u>yes</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 – Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																
2. <u><i>Dicentra formosa</i></u>	<u>25</u>	<u>yes</u>	<u>FACU</u>																	
3. <u><i>Urtica dioica</i></u>	<u>15</u>	<u>no</u>	<u>FAC</u>																	
4. <u><i>Claytonia sibirica</i></u>	<u>5</u>	<u>no</u>	<u>FAC</u>																	
5. <u><i>Galium aparine</i></u>	<u>5</u>	<u>no</u>	<u>FACU</u>																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
50% = _____, 20% = <u>2</u>	<u>90</u>	= Total Cover																		
<u>Woody Vine Stratum (Plot size: 15')</u>																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
50% = _____, 20% = _____	<u>0</u>	= Total Cover																		
% Bare Ground in Herb Stratum <u>10</u>																				
<table style="width: 100%; border: none;"> <tr> <td style="width: 35%;">Hydrophytic Vegetation Present?</td> <td style="width: 10%;">Yes</td> <td style="width: 10%;"><input checked="" type="checkbox"/></td> <td style="width: 10%;">No</td> <td style="width: 10%;"><input type="checkbox"/></td> </tr> </table>					Hydrophytic Vegetation Present?	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>											
Hydrophytic Vegetation Present?	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>																
Remarks:																				

SOIL

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 ¹	Loc ²		
0-20	7.5YR 2/1	100	_____	_____	_____	_____	lo sa gr	loamy sandy gravel
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
¹ Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ² Location: PL=Pore Lining, M=Matrix								
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)						Indicators for Problematic Hydric Soils³:		
<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)			³ 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)					
Restrictive Layer (if present):					Hydric Soils Present?			
Type: _____					Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>			
Depth (inches): _____								
Remarks: Soil has a large percentage of rounded cobbles ranging from small to large								

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)	<input type="checkbox"/> Water-Stained Leaves (B9)	
<input type="checkbox"/> High Water Table (A2)	(except MLRA 1, 2, 4A, and 4B)	(MLRA 1, 2, 4A, and 4B)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Stunted or Stresses Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)			
Field Observations:		Wetland Hydrology Present?	
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Water Table Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Saturation Present? (includes capillary fringe)	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Depth (inches): _____			
Depth (inches): _____			
Depth (inches): _____			
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks:			

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

Project Site: Salmon Springs Transmission Main Replacement City/County: Sumner/Pierce Sampling Date: 4/8/15
 Applicant/Owner: City of Puyallup State: WA Sampling Point: TP-2
 Investigator(s): Jason Cade, Widener and Associates Section, Township, Range: 18, 20N, 05E
 Landform (hillslope, terrace, etc.): valley side Local relief (concave, convex, none): convex Slope (%): 2
 Subregion (LRR): A Lat: 47.217758 N Long: -122.222007 W Datum: NAD83
 Soil Map Unit Name: Xerochrepts, 45 to 70% slopes 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"/>	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"/>		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Remarks:					

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:	
1. <u><i>Alnus rubra</i></u>	<u>50</u>	<u>yes</u>	<u>FAC</u>	Number of Dominant Species That Are OBL, FACW, or FAC:	1 (A)
2. <u><i>Thuja plicata</i></u>	<u>5</u>	<u>no</u>	<u>FAC</u>	Total Number of Dominant Species Across All Strata:	2 (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC:	50 (A/B)
4. _____	_____	_____	_____		
50% = <u>1</u> , 20% = _____	<u>55</u>	= Total Cover			
<u>Sapling/Shrub Stratum (Plot size: 15')</u>				Prevalence Index worksheet:	
1. <u><i>Rubus spectabilis</i></u>	<u>10</u>	<u>no</u>	<u>FAC</u>	Total % Cover of:	Multiply by:
2. <u><i>Sambucus racemosa</i></u>	<u>3</u>	<u>no</u>	<u>FACU</u>	OBL species _____	x1 = _____
3. <u><i>Acer circinatum</i></u>	<u>2</u>	<u>no</u>	<u>FAC</u>	FACW species _____	x2 = _____
4. _____	_____	_____	_____	FAC species <u>77</u>	x3 = <u>231</u>
5. _____	_____	_____	_____	FACU species <u>43</u>	x4 = <u>172</u>
50% = _____, 20% = _____	<u>15</u>	= Total Cover		UPL species _____	x5 = _____
<u>Herb Stratum (Plot size: 5')</u>				Column Totals:	<u>120</u> (A) <u>403</u> (B)
1. <u><i>Dicentra formosa</i></u>	<u>40</u>	<u>yes</u>	<u>FACU</u>	Prevalence Index = B/A = <u>3.36</u>	
2. <u><i>Claytonia sibirica</i></u>	<u>5</u>	<u>no</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators:	
3. <u><i>Hydrophyllum tenuipes</i></u>	<u>5</u>	<u>no</u>	<u>FAC</u>		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
9. _____	_____	_____	_____		
10. _____	_____	_____	_____		
11. _____	_____	_____	_____		
50% = _____, 20% = <u>1</u>	<u>50</u>	= Total Cover			
<u>Woody Vine Stratum (Plot size: 15')</u>				Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
1. _____	_____	_____	_____		
2. _____	_____	_____	_____		
50% = _____, 20% = _____	<u>0</u>	= Total Cover			
% Bare Ground in Herb Stratum <u>50</u>					
Remarks:					

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

Project Site: Salmon Springs Transmission Main Replacement City/County: Sumner/Pierce Sampling Date: 4/8/15
 Applicant/Owner: City of Puyallup State: WA Sampling Point: TP-3
 Investigator(s): Jason Cade, Widener and Associates Section, Township, Range: 18, 20N, 05E
 Landform (hillslope, terrace, etc.): valley side Local relief (concave, convex, none): convex Slope (%): 2
 Subregion (LRR): A Lat: 47.218001 N Long: -122.22169 W Datum: NAD83
 Soil Map Unit Name: Xerochrepts, 45 to 70% slopes 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"/>	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"/>		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Remarks:					

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:																
1. <u><i>Alnus rubra</i></u>	30	yes	FAC	Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>66.7</u> (A/B)																
2. <u><i>Acer macrophyllum</i></u>	10	no	FACU																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
50% = _____, 20% = <u>1</u>	40	= Total Cover		Prevalence Index worksheet: <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; text-align: center;"><u>Total % Cover of:</u></td> <td style="width: 50%; text-align: center;"><u>Multiply by:</u></td> </tr> <tr> <td>OBL species _____</td> <td>x1 = _____</td> </tr> <tr> <td>FACW species _____</td> <td>x2 = _____</td> </tr> <tr> <td>FAC species _____</td> <td>x3 = _____</td> </tr> <tr> <td>FACU species _____</td> <td>x4 = _____</td> </tr> <tr> <td>UPL species _____</td> <td>x5 = _____</td> </tr> <tr> <td>Column Totals: _____ (A)</td> <td>_____ (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = _____</td> </tr> </table>	<u>Total % Cover of:</u>	<u>Multiply by:</u>	OBL species _____	x1 = _____	FACW species _____	x2 = _____	FAC species _____	x3 = _____	FACU species _____	x4 = _____	UPL species _____	x5 = _____	Column Totals: _____ (A)	_____ (B)	Prevalence Index = B/A = _____	
<u>Total % Cover of:</u>	<u>Multiply by:</u>																			
OBL species _____	x1 = _____																			
FACW species _____	x2 = _____																			
FAC species _____	x3 = _____																			
FACU species _____	x4 = _____																			
UPL species _____	x5 = _____																			
Column Totals: _____ (A)	_____ (B)																			
Prevalence Index = B/A = _____																				
<u>Sapling/Shrub Stratum (Plot size: 15')</u>																				
1. <u><i>Acer circinatum</i></u>	15	no	FAC																	
2. <u><i>Sambucus racemosa</i></u>	15	no	FACU																	
3. <u><i>Rubus spectabilis</i></u>	10	no	FAC																	
4. <u><i>Ilex aquifolium</i></u>	5	no	FACU																	
5. _____	_____	_____	_____																	
50% = _____, 20% = _____	45	= Total Cover																		
<u>Herb Stratum (Plot size: 5')</u>																				
1. <u><i>Dicentra formosa</i></u>	30	yes	FACU																	
2. <u><i>Hydrophyllum tenuipes</i></u>	20	yes	FAC																	
3. <u><i>Polystichum munitum</i></u>	10	no	FACU																	
4. <u><i>Rubus spectabilis</i></u>	5	no	FAC																	
5. <u><i>Galium aparine</i></u>	2	no	FACU																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
50% = _____, 20% = <u>2</u>	67	= Total Cover																		
<u>Woody Vine Stratum (Plot size: 15')</u>																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
50% = _____, 20% = _____	0	= Total Cover																		
% Bare Ground in Herb Stratum <u>33</u>																				
<table style="width: 100%; border: none;"> <tr> <td style="width: 35%;">Hydrophytic Vegetation Present?</td> <td style="width: 10%;">Yes</td> <td style="width: 10%;">No</td> <td style="width: 45%;"></td> </tr> <tr> <td></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td></td> </tr> </table>				Hydrophytic Vegetation Present?	Yes	No			<input checked="" type="checkbox"/>	<input type="checkbox"/>										
Hydrophytic Vegetation Present?	Yes	No																		
	<input checked="" type="checkbox"/>	<input type="checkbox"/>																		
Remarks:																				

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

Project Site: Salmon Springs Transmission Main Replacement City/County: Sumner/Pierce Sampling Date: 4/8/15
 Applicant/Owner: City of Puyallup State: WA Sampling Point: TP-4
 Investigator(s): Jason Cade, Widener and Associates Section, Township, Range: 18, 20N, 05E
 Landform (hillslope, terrace, etc.): valley side Local relief (concave, convex, none): none Slope (%): 2
 Subregion (LRR): A Lat: 47.218315 N Long: -122.221123 W Datum: NAD83
 Soil Map Unit Name: Xerochrepts, 45 to 70% slopes 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"/>	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"/>		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Remarks:					

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:																
1. <u><i>Acer macrophyllum</i></u>	<u>20</u>	<u>yes</u>	<u>FACU</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50</u> (A/B)																
2. <u><i>Thuja plicata</i></u>	<u>10</u>	<u>no</u>	<u>FAC</u>																	
3. <u><i>Alnus rubra</i></u>	<u>10</u>	<u>no</u>	<u>FAC</u>																	
4. _____	_____	_____	_____																	
50% = _____, 20% = <u>1</u>	<u>40</u>	= Total Cover		Prevalence Index worksheet: <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Total % Cover of:</th> <th style="width: 50%;">Multiply by:</th> </tr> </thead> <tbody> <tr> <td>OBL species _____</td> <td>x1 = _____</td> </tr> <tr> <td>FACW species _____</td> <td>x2 = _____</td> </tr> <tr> <td>FAC species <u>125</u></td> <td>x3 = <u>375</u></td> </tr> <tr> <td>FACU species <u>25</u></td> <td>x4 = <u>100</u></td> </tr> <tr> <td>UPL species _____</td> <td>x5 = _____</td> </tr> <tr> <td>Column Totals: <u>150</u> (A)</td> <td><u>475</u> (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = <u>3.17</u></td> </tr> </tbody> </table>	Total % Cover of:	Multiply by:	OBL species _____	x1 = _____	FACW species _____	x2 = _____	FAC species <u>125</u>	x3 = <u>375</u>	FACU species <u>25</u>	x4 = <u>100</u>	UPL species _____	x5 = _____	Column Totals: <u>150</u> (A)	<u>475</u> (B)	Prevalence Index = B/A = <u>3.17</u>	
Total % Cover of:	Multiply by:																			
OBL species _____	x1 = _____																			
FACW species _____	x2 = _____																			
FAC species <u>125</u>	x3 = <u>375</u>																			
FACU species <u>25</u>	x4 = <u>100</u>																			
UPL species _____	x5 = _____																			
Column Totals: <u>150</u> (A)	<u>475</u> (B)																			
Prevalence Index = B/A = <u>3.17</u>																				
Sapling/Shrub Stratum (Plot size: 15')																				
1. <u><i>Rubus spectabilis</i></u>	<u>10</u>	<u>no</u>	<u>FAC</u>																	
2. <u><i>Sambucus racemosa</i></u>	<u>5</u>	<u>no</u>	<u>FACU</u>																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
50% = _____, 20% = _____	<u>15</u>	= Total Cover																		
Herb Stratum (Plot size: 5')																				
1. <u><i>Hydrophyllum tenuipes</i></u>	<u>80</u>	<u>yes</u>	<u>FAC</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 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																
2. <u><i>Urtica dioica</i></u>	<u>10</u>	<u>no</u>	<u>FAC</u>																	
3. <u><i>Rubus spectabilis</i></u>	<u>5</u>	<u>no</u>	<u>FAC</u>																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
50% = <u>1</u> , 20% = _____	<u>95</u>	= Total Cover																		
Woody Vine Stratum (Plot size: 15')																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
50% = _____, 20% = _____	<u>0</u>	= Total Cover																		
% Bare Ground in Herb Stratum <u>5</u>																				
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Hydrophytic Vegetation Present?</td> <td style="width: 10%;">Yes <input type="checkbox"/></td> <td style="width: 10%;">No <input checked="" type="checkbox"/></td> </tr> </table>				Hydrophytic Vegetation Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>														
Hydrophytic Vegetation Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>																		
Remarks:																				

SOIL

Sampling Point: TP-4

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 ¹	Loc ²		
0-2	7.5YR 2/1	100	_____	_____	_____	_____	duff	_____
2-8	7.5YR 2/1	100	_____	_____	_____	_____	gr sa lo	gravelly sandy loam
8-20	2.5Y 3/3	100	_____	_____	_____	_____	gr sa lo	gravelly sandy loam
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____

¹Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: 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 Soils³:

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

³Indicators 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: Soil has a large percentage of rounded cobbles ranging from small to medium-sized

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:

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

Project Site: Salmon Springs Transmission Main Replacement City/County: Sumner/Pierce Sampling Date: 4/8/15
 Applicant/Owner: City of Puyallup State: WA Sampling Point: TP-5
 Investigator(s): Jason Cade, Widener and Associates Section, Township, Range: 18, 20N, 05E
 Landform (hillslope, terrace, etc.): valley side Local relief (concave, convex, none): concave Slope (%): 2
 Subregion (LRR): A Lat: 47.218024 N Long: -122.221758 W Datum: NAD83
 Soil Map Unit Name: Xerochrepts, 45 to 70% slopes 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"/>	Is the Sampled Area within a Wetland?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>		Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>		Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Remarks:					

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:																
1. <u><i>Alnus rubra</i></u>	<u>40</u>	<u>yes</u>	<u>FAC</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)																
2. <u><i>Acer macrophyllum</i></u>	<u>10</u>	<u>no</u>	<u>FACU</u>																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
50% = _____, 20% = <u>1</u>	<u>50</u>	= Total Cover		Prevalence Index worksheet: <table style="width: 100%; border: none;"> <tr> <td style="text-align: center;">Total % Cover of:</td> <td style="text-align: center;">Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x1 = _____</td> </tr> <tr> <td>FACW species _____</td> <td>x2 = _____</td> </tr> <tr> <td>FAC species _____</td> <td>x3 = _____</td> </tr> <tr> <td>FACU species _____</td> <td>x4 = _____</td> </tr> <tr> <td>UPL species _____</td> <td>x5 = _____</td> </tr> <tr> <td>Column Totals: _____ (A)</td> <td>_____ (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = _____</td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species _____	x1 = _____	FACW species _____	x2 = _____	FAC species _____	x3 = _____	FACU species _____	x4 = _____	UPL species _____	x5 = _____	Column Totals: _____ (A)	_____ (B)	Prevalence Index = B/A = _____	
Total % Cover of:	Multiply by:																			
OBL species _____	x1 = _____																			
FACW species _____	x2 = _____																			
FAC species _____	x3 = _____																			
FACU species _____	x4 = _____																			
UPL species _____	x5 = _____																			
Column Totals: _____ (A)	_____ (B)																			
Prevalence Index = B/A = _____																				
<u>Sapling/Shrub Stratum (Plot size: 15')</u>																				
1. <u><i>Rubus spectabilis</i></u>	<u>30</u>	<u>yes</u>	<u>FAC</u>																	
2. <u><i>Sambucus racemosa</i></u>	<u>5</u>	<u>no</u>	<u>FACU</u>																	
3. <u><i>Acer circinatum</i></u>	<u>10</u>	<u>no</u>	<u>FAC</u>																	
4. <u><i>Oemleria cerasiformis</i></u>	<u>5</u>	<u>no</u>	<u>FACU</u>																	
5. _____	_____	_____	_____																	
50% = _____, 20% = <u>1</u>	<u>50</u>	= Total Cover																		
<u>Herb Stratum (Plot size: 5')</u>																				
1. <u><i>Equisetum arvense</i></u>	<u>30</u>	<u>yes</u>	<u>FAC</u>																	
2. <u><i>Nasturtium officinale</i></u>	<u>20</u>	<u>yes</u>	<u>OBL</u>																	
3. <u><i>Oenanthe sarmentosa</i></u>	<u>20</u>	<u>yes</u>	<u>OBL</u>																	
4. <u><i>Tolmiea menziesii</i></u>	<u>10</u>	<u>no</u>	<u>FAC</u>																	
5. <u><i>Claytonia sibirica</i></u>	<u>2</u>	<u>no</u>	<u>FAC</u>																	
6. <u><i>Athyrium filix-femina</i></u>	<u>3</u>	<u>no</u>	<u>FAC</u>																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
50% = _____, 20% = <u>3</u>	<u>85</u>	= Total Cover																		
<u>Woody Vine Stratum (Plot size: 15')</u>																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
50% = _____, 20% = _____	<u>0</u>	= Total Cover																		
% Bare Ground in Herb Stratum <u>15</u>																				
<table style="width: 100%; border: none;"> <tr> <td style="width: 35%;">Hydrophytic Vegetation Present?</td> <td style="width: 10%;">Yes</td> <td style="width: 10%;">No</td> <td style="width: 10%;"></td> <td style="width: 35%;"></td> </tr> <tr> <td></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td></td> </tr> </table>				Hydrophytic Vegetation Present?	Yes	No				<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
Hydrophytic Vegetation Present?	Yes	No																		
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																	
Remarks:																				

SOIL

Sampling Point: TP-5

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 ¹	Loc ²		
0-8	<u>10YR 2/1</u>	<u>100</u>	_____	_____	_____	_____	<u>mu sa gr lo</u>	<u>mucky sandy gravelly loam</u>
8-20	<u>10YR 2/2</u>	<u>100</u>	_____	_____	_____	_____	<u>mu sa gr lo</u>	<u>mucky sandy gravelly loam</u>
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
¹ Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ² Location: PL=Pore Lining, M=Matrix								
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)						Indicators for Problematic Hydric Soils³:		
<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 checked="" 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)			³ 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)					
Restrictive Layer (if present):			Hydric Soils Present?					
Type: _____			Depth (inches): _____					
Remarks: Soil has a large percentage of rounded cobbles ranging from small to medium-sized								

HYDROLOGY

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)	
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Water-Stained Leaves (B9)	
<input checked="" type="checkbox"/> High Water Table (A2)	(except MLRA 1, 2, 4A, and 4B)	(MLRA 1, 2, 4A, and 4B)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Salt Crust (B11)	<input checked="" type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Stunted or Stresses Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)			
Field Observations:		Wetland Hydrology Present?	
Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): <u>0</u>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): <u>2</u>		
Saturation Present? (includes capillary fringe) Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): <u>0</u>		
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks: Water observed on surface trickling down slope in this area			

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

Project Site: Salmon Springs Transmission Main Replacement City/County: Sumner/Pierce Sampling Date: 4/8/15
 Applicant/Owner: City of Puyallup State: WA Sampling Point: TP-6
 Investigator(s): Jason Cade, Widener and Associates Section, Township, Range: 18, 20N, 05E
 Landform (hillslope, terrace, etc.): valley side Local relief (concave, convex, none): concave Slope (%): 2
 Subregion (LRR): A Lat: 47.217373 N Long: -122.222235 W Datum: NAD83
 Soil Map Unit Name: Xerochrepts, 45 to 70% slopes 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"/>	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"/>		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Remarks:					

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:																
1. <u><i>Alnus rubra</i></u>	<u>30</u>	<u>yes</u>	<u>FAC</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)																
2. <u><i>Pseudotsuga menziesii</i></u>	<u>10</u>	<u>no</u>	<u>FACU</u>																	
3. <u><i>Prunus emarginata</i></u>	<u>10</u>	<u>no</u>	<u>FACU</u>																	
4. _____	_____	_____	_____																	
50% = _____, 20% = <u>1</u>	<u>50</u>	= Total Cover		Prevalence Index worksheet: <table style="width: 100%; border: none;"> <tr> <td style="text-align: center; border: none;">Total % Cover of:</td> <td style="text-align: center; border: none;">Multiply by:</td> </tr> <tr> <td style="border: none;">OBL species _____</td> <td style="border: none;">x1 = _____</td> </tr> <tr> <td style="border: none;">FACW species _____</td> <td style="border: none;">x2 = _____</td> </tr> <tr> <td style="border: none;">FAC species _____</td> <td style="border: none;">x3 = _____</td> </tr> <tr> <td style="border: none;">FACU species _____</td> <td style="border: none;">x4 = _____</td> </tr> <tr> <td style="border: none;">UPL species _____</td> <td style="border: none;">x5 = _____</td> </tr> <tr> <td style="border: none;">Column Totals: _____ (A)</td> <td style="border: none;">_____ (B)</td> </tr> <tr> <td colspan="2" style="border: none; text-align: center;">Prevalence Index = B/A = _____</td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species _____	x1 = _____	FACW species _____	x2 = _____	FAC species _____	x3 = _____	FACU species _____	x4 = _____	UPL species _____	x5 = _____	Column Totals: _____ (A)	_____ (B)	Prevalence Index = B/A = _____	
Total % Cover of:	Multiply by:																			
OBL species _____	x1 = _____																			
FACW species _____	x2 = _____																			
FAC species _____	x3 = _____																			
FACU species _____	x4 = _____																			
UPL species _____	x5 = _____																			
Column Totals: _____ (A)	_____ (B)																			
Prevalence Index = B/A = _____																				
<u>Sapling/Shrub Stratum (Plot size: 15')</u>																				
1. <u><i>Acer circinatum</i></u>	<u>20</u>	<u>yes</u>	<u>FAC</u>																	
2. <u><i>Rubus spectabilis</i></u>	<u>10</u>	<u>no</u>	<u>FAC</u>																	
3. <u><i>Ilex aquifolium</i></u>	<u>5</u>	<u>no</u>	<u>FACU</u>																	
4. <u><i>Ribes divaricatum</i></u>	<u>2</u>	<u>no</u>	<u>FAC</u>																	
5. _____	_____	_____	_____																	
50% = _____, 20% = <u>1</u>	<u>37</u>	= Total Cover																		
<u>Herb Stratum (Plot size: 5')</u>																				
1. <u><i>Hydrophyllum tenuipes</i></u>	<u>70</u>	<u>yes</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 – Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 – Dominance Test is >50% <input type="checkbox"/> 3 – Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 – Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 – Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																
2. <u><i>Urtica dioica</i></u>	<u>10</u>	<u>no</u>	<u>FAC</u>																	
3. <u><i>Polystichum munitum</i></u>	<u>10</u>	<u>no</u>	<u>FACU</u>																	
4. <u><i>Oemleria cerasiformis</i></u>	<u>3</u>	<u>no</u>	<u>FACU</u>																	
5. <u><i>Rubus spectabilis</i></u>	<u>2</u>	<u>no</u>	<u>FAC</u>																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
50% = <u>1</u> , 20% = _____	<u>95</u>	= Total Cover																		
<u>Woody Vine Stratum (Plot size: 15')</u>																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
50% = _____, 20% = _____	<u>0</u>	= Total Cover																		
% Bare Ground in Herb Stratum <u>5</u>																				
Remarks:																				

SOIL

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 ¹	Loc ²		
0-20	7.5YR 2/1	100	_____	_____	_____	_____	lo sa gr	loamy sandy gravel
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
¹ Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.			² Location: PL=Pore Lining, M=Matrix					
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)						Indicators for Problematic Hydric Soils³:		
<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)			³ 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)					
Restrictive Layer (if present):								
Type: _____						Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Depth (inches): _____								
Remarks: Soil has a large percentage of rounded cobbles ranging from small to medium-sized								

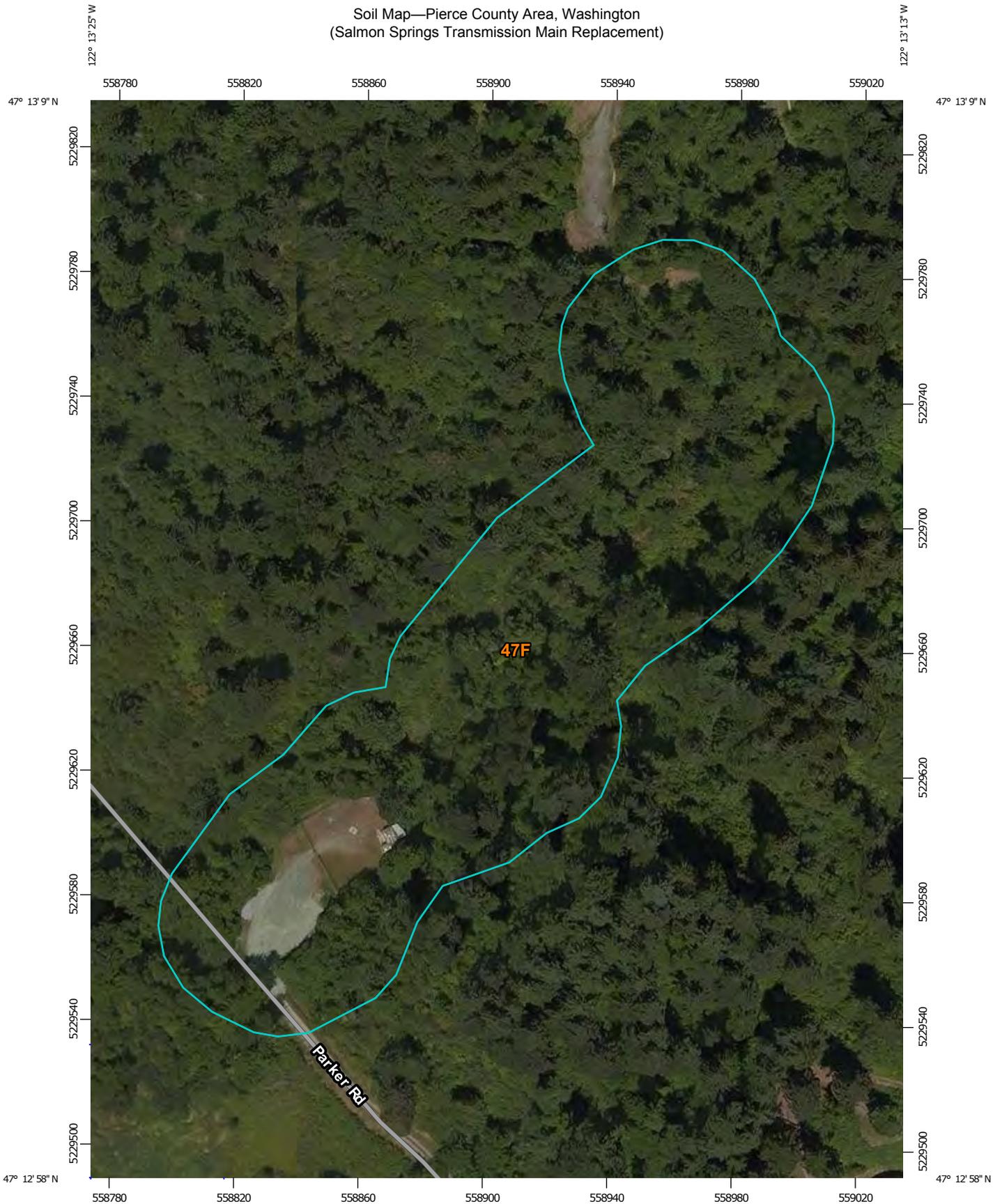
HYDROLOGY

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)	<input type="checkbox"/> Water-Stained Leaves (B9)	
<input type="checkbox"/> High Water Table (A2)	(except MLRA 1, 2, 4A, and 4B)	(MLRA 1, 2, 4A, and 4B)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Stunted or Stresses Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)			
Field Observations:		Wetland Hydrology Present?	
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____		
Saturation Present? (includes capillary fringe) Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____		
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks: TP-6 is within a topographical depression separated from Salmon Tributary by a natural upland levee. No primary indicators of wetland hydrology were observed and geomorphic position is the only secondary hydrology indicator observed. Soils are very well drained as there is a large percentage of sand and gravel.			

Appendix B – NRCS Soil Data

This page intentionally left blank for printing purposes.

Soil Map—Pierce County Area, Washington
(Salmon Springs Transmission Main Replacement)



Map Scale: 1:1,680 if printed on A portrait (8.5" x 11") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

 Area of Interest (AOI)	 Spoil Area
 Soil Map Unit Polygons	 Stony Spot
 Soil Map Unit Lines	 Very Stony Spot
 Soil Map Unit Points	 Wet Spot
 Special Point Features	 Other
 Blowout	 Special Line Features
 Borrow Pit	 Water Features
 Clay Spot	 Streams and Canals
 Closed Depression	 Transportation
 Gravel Pit	 Rails
 Gravelly Spot	 Interstate Highways
 Landfill	 US Routes
 Lava Flow	 Major Roads
 Marsh or swamp	 Local Roads
 Mine or Quarry	 Background
 Miscellaneous Water	 Aerial Photography
 Perennial Water	
 Rock Outcrop	
 Saline Spot	
 Sandy Spot	
 Severely Eroded Spot	
 Sinkhole	
 Slide or Slip	
 Sodic Spot	

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Pierce County Area, Washington
Survey Area Data: Version 9, Sep 16, 2014

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 8, 2014—Jul 15, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Pierce County Area, Washington (WA653)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
47F	Xerochrepts, 45 to 70 percent slopes	5.4	100.0%
Totals for Area of Interest		5.4	100.0%

Pierce County Area, Washington

47F—Xerochrepts, 45 to 70 percent slopes

Map Unit Setting

National map unit symbol: 2hr5

Mean annual precipitation: 30 to 50 inches

Mean annual air temperature: 45 to 46 degrees F

Farmland classification: Not prime farmland

Map Unit Composition

Xerochrepts and similar soils: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Xerochrepts

Setting

Landform: Valley sides

Parent material: Sandy and gravelly outwash and/or glacial till

Typical profile

H1 - 0 to 6 inches: gravelly sandy loam

H2 - 6 to 40 inches: gravelly sandy loam

H3 - 40 to 60 inches: very gravelly sandy loam

Properties and qualities

Slope: 45 to 70 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat):

Moderately high to high (0.57 to 5.95 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7e

Hydrologic Soil Group: A

Minor Components

Coastal beaches

Percent of map unit:

Landform: Alluvial cones

Data Source Information

Soil Survey Area: Pierce County Area, Washington

Survey Area Data: Version 9, Sep 16, 2014

Appendix C – Hydrologic Data

This page intentionally left blank for printing purposes.

USDA Field Office Climate Data

WETS Station : MC MILLIN RSVR, WA5224 Creation Date: 05/28/2015
 Latitude: 4708 Longitude: 12215 Elevation: 00579
 State FIPS/County(FIPS): 53053 County Name: Pierce
 Start yr. - 1971 End yr. - 2000

Month	Temperature (Degrees F.)			Precipitation (Inches)					
	avg daily max	avg daily min	avg	avg	30% chance will have		avg	snow fall	
					less than	more than	# of days w/.1 or more		total
January	44.5	31.7	38.1	5.54	3.67	6.65	13	1.8	
February	48.0	33.2	40.6	4.68	3.06	5.63	11	1.1	
March	52.3	35.4	43.9	4.38	3.49	5.02	13	0.9	
April	57.4	38.3	47.9	3.45	2.47	4.08	10	0.0	
May	63.6	43.5	53.6	2.64	1.76	3.16	8	0.0	
June	68.7	47.9	58.3	2.19	1.50	2.61	6	0.0	
July	74.5	51.2	62.9	1.16	0.45	1.40	3	0.0	
August	75.3	51.4	63.4	1.23	0.48	1.49	3	0.0	
September	69.5	46.9	58.2	2.00	0.70	2.42	6	0.0	
October	59.3	40.7	50.0	3.40	1.97	4.14	9	0.1	
November	49.4	36.0	42.7	6.53	4.53	7.77	14	1.0	
December	44.1	32.0	38.1	5.92	4.23	6.99	13	2.0	
Annual	-----	-----	-----	-----	38.98	46.65	--	-----	
Average	58.9	40.7	49.8	-----	-----	-----	--	-----	
Average	-----	-----	-----	43.12	-----	-----	109	6.6	

GROWING SEASON DATES

Probability	Temperature		
	24 F or higher	28 F or higher	32 F or higher
	Beginning and Ending Dates		
	Growing Season Length		
50 percent *	2/ 8 to 12/ 3 297 days	3/22 to 11/11 234 days	4/20 to 10/17 179 days
70 percent *	1/30 to 12/12 315 days	3/13 to 11/20 251 days	4/14 to 10/23 192 days

 * Percent chance of the growing season occurring between the Beginning
 and Ending dates.

total 1941-2015 prcp

Station : WA5224, MC MILLIN RSVR

----- Unit = inches

yr	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec	annl
41			1.79	2.07	3.87	1.45	0.00	2.45	2.88	2.67	4.04	7.19	28.41
42	2.68	2.29	1.86	1.57	2.92	3.04	1.36	0.21	0.03	2.63	8.64	4.06	31.29
43	1.85	2.18	3.98	3.88	1.76	2.15	0.27	0.67	1.08	4.24	2.08	2.65	26.79
44	3.86	3.19	1.29	2.40	1.88	0.85	0.10	0.29	2.28	1.38	3.75	1.35	22.62
45	4.59	4.91	3.80	3.67	4.14	0.14	0.37	0.76	3.91	2.98	5.43	5.24	39.94
46	5.68	5.30	4.41	1.50	0.66	5.12	2.30	0.09	2.97	3.62	5.87	7.05	44.57
47	5.04	2.98	3.09	3.01	0.29	3.91	1.24	0.26	0.86	8.37	3.77	4.39	37.21
48	4.30	5.15	3.67	3.74	3.80	2.22	2.65	1.87	3.78	2.89	6.10	6.38	46.55
49	0.89	6.51	3.10	2.18	1.61	0.87	0.50	0.73	1.61	3.95	7.20	6.18	35.33
50	7.18	5.82	7.08	3.17	1.16	1.67	0.79	1.22	1.73	7.09	7.67	7.72	52.30
51	5.81	8.48	3.78	0.44	1.74	0.10	0.05	0.68	2.42	5.24	4.30	3.77	36.81
52	3.09	3.32	3.04	2.73	1.61	1.01	0.42	0.29	0.11	1.03	1.24	4.18	22.07
53	12.97	3.11	2.95	2.91	3.26	2.41	0.32	1.47	1.36	4.16	6.94	7.11	48.97
54	8.59	4.13	2.43	3.45	1.89	3.24	1.32	2.41	2.27	2.75	5.24	4.42	42.14
55	2.28	3.23	3.92	4.69	1.59	1.40	2.50	0.15	2.16	7.02	8.16	10.37	47.47
56	7.58	2.69	5.75	0.61	1.10	3.17	0.52	1.08	1.70	5.94	2.81	6.08	39.03
57	2.32	5.32	6.29	1.86	2.14	2.44	1.00	1.94	1.85	3.38	3.35	5.99	37.88
58	6.90	5.50	1.51	4.39	1.70	1.69	0.02	0.42	1.88	3.74	9.39	6.66	43.80
59	7.55	2.69	3.20	3.20	2.35	3.16	0.53	0.73	4.75	3.94	7.88	5.14	45.12
60	5.13	4.44	4.02	3.95	4.76	1.33	0.00	4.34	1.11	4.13	11.49	3.11	47.81
61	6.05	9.49	3.86	3.04	3.01	1.08	0.51	0.54	0.47	3.49	4.00	5.30	40.84
62	2.38	2.38	4.07	3.13	3.10	0.98	0.33	2.72	2.44	3.28	8.97	5.27	39.05
63	1.76	5.19	4.05	4.32	1.61	1.65	1.84	2.03	0.79	4.82	7.61	4.43	40.10
64	10.23	1.80	3.25	2.08	1.64	3.52	1.55	1.30	1.00	2.43	7.91	7.68	44.39
65	6.69	4.00	0.59	4.51	1.76	0.44	1.32	2.83	0.56	3.45	4.52	6.10	36.77
66	5.22	2.48	5.25	2.62	1.61	3.20	1.79	0.26	2.29	3.39	5.36	7.05	40.52
67	9.51	2.91	4.71	2.97	0.84	2.31	0.10	0.00	1.08	7.10	2.85	2.89	37.27
68	5.10	6.17	4.77	1.34	2.34	3.93	0.60	5.21	2.02	5.14	5.54	6.77	48.93
69	6.81	2.27	2.35	3.93	2.76	1.94	0.35	0.46	4.96	2.30	3.09	6.15	37.37
70	8.91	2.92	2.25	3.89	1.81	0.41	0.50	0.24	2.18	3.19	4.39	7.80	38.49
71	7.34	3.39	6.21	2.75	2.06	3.13	1.06	0.43	4.48	3.15	5.53	6.00	45.53
72	8.23	7.99	6.58	4.61	1.04	2.81	1.51	1.39	4.32	0.86	3.47	8.18	50.99
73	3.65	2.23	2.63	1.77	2.30	3.35	0.07	0.27	2.52	4.16	8.51	8.24	39.70
74	7.08	4.74	5.54	4.52	3.18	2.14	2.14	0.11	0.34	1.75	7.82	7.38	46.74
75	8.34	6.06	3.36	1.78	1.92	1.17	0.51	4.65	0.01	7.01	5.59	9.18	49.58
76	5.75	4.64	3.26	3.07	2.38	1.35	1.42	4.29	1.67	1.35	1.50	2.74	33.42
77	1.35	1.60	4.45	1.32	4.07	1.65	0.18	3.82	3.97	2.91	5.68	7.32	38.32
78	5.16	2.72	2.71	4.09	2.65	1.19	1.63	2.09	5.56	0.48	6.21	3.04	37.53
79	2.62	6.68	2.32	3.05	1.66	0.67	1.88	2.05	3.91	4.22	2.22	8.81	40.09
80	5.66	5.90	3.73	4.28	1.40	2.57	0.59	0.98	2.07	0.96	8.12	8.85	45.11
81	2.63	6.54	2.84	3.91	2.24	3.98	0.97	0.46	3.11	5.22	4.59	7.11	43.60
82	5.91	8.77	3.53	3.63	0.81	1.49	1.81	0.96	2.16	4.37	4.55	6.36	44.35
83	7.50	4.40	5.61	1.44	1.94	3.33	3.94	2.48	2.46	2.12	8.83	4.79	48.84
84	5.68	3.50	5.01	3.06	4.77	4.77	0.01	0.41	1.20	3.15	8.32	5.42	45.30
85	0.47	2.23	3.20	2.06	1.67	2.35	0.03	1.22	1.78	6.85	4.37	1.60	27.83

86	8.50	4.72	3.40	2.32	3.40	1.03	2.03	0.32	3.08	2.89	9.85	3.18	44.72
87	4.62	3.95	5.55	3.62	3.33	0.54	0.54	0.44	0.71	0.35	3.16	6.86	33.67
88	4.08	1.49	5.98	4.68	4.35	2.40	1.18	0.60	2.09	2.98	9.17	3.51	42.51
89	3.74	3.30	6.95	3.57	2.81	1.40	0.69	0.82	0.29	2.15	7.52	4.51	37.75
90	10.65	6.01	3.42	3.04	2.90	4.04	0.70	1.52	0.04	5.88	10.74	4.26	53.20
91	3.61	5.75	4.86	6.66	2.71	1.55	0.28	1.38	0.59	1.87	7.17	3.57	40.00
92	6.09	3.52	2.10	4.68	0.22	1.94	1.03	0.92	1.98	2.22	6.91	3.63	35.24
93	3.57	0.33	4.77	6.60	4.00	3.23	2.20	0.31	0.00	1.74	1.63	4.75	33.13
94	3.35	M4.59	4.09	2.84	1.86	2.32	1.19	0.42	2.47	5.36	6.04	8.80	43.33
95	4.21	5.35	4.92	2.88	1.56	1.73	1.76		1.72	4.71	9.51	6.17	44.52
96	8.16	8.73	2.57	7.23	4.57	1.34	1.08	0.30	2.34	6.07	8.26	12.23	62.88
97	7.82	3.83	7.06	3.80	2.91	2.82	1.96	1.13	2.51	M6.13	4.27	3.10	47.34
98	M7.60	4.05	5.01	1.53	3.08	M1.18	0.29	0.05	0.46	3.98	11.16	9.69	48.08
99	8.63	6.53	5.06	1.28	3.26	2.28	0.97	M0.88	0.44	3.10	11.33	5.14	48.90
0	4.33	6.30	4.67	3.45	4.14	1.89	1.17	0.37	1.56	4.11	3.97	3.02	38.98
1	2.82	3.10	3.62	4.38	2.43	4.01	M0.55	1.66	0.78	M2.75	9.59	6.58	42.27
2	6.02	4.88	4.82	4.41	2.45	2.25	0.82	0.30	0.50	1.19	M2.32	M6.11	36.07
3	7.53	1.92	6.18	3.38	0.69	0.41	0.32	0.53	1.08	7.15	5.67	6.62	41.48
4	7.03	2.55	1.93	M0.99	4.24	1.01	0.06	3.73	3.02	4.01	M3.25	4.36	36.18
5	M4.36	0.69	4.68	5.59	M4.32	4.29	1.42	0.15	1.83	M3.73	6.07	6.78	43.91
6	12.01	3.51	M2.54	M4.05	2.21	2.21	0.41	M0.04	M0.77	M1.86	14.30	8.95	52.86
7	6.66	4.63	M6.54	2.06	1.11	2.89	1.61	1.08	2.14	M4.85	2.81	7.58	43.96
8	4.44	3.81	5.10	1.85	1.37	1.74	1.18	2.06	0.56	2.69	8.42	5.56	38.78
9	M7.40	1.52	5.42	3.48	M3.96	1.78	0.02	2.15	2.81	5.89	9.31	3.22	46.96
10	8.56	3.16	M2.85	3.48	5.06	4.38	0.33	0.31	3.95	3.96	7.12	7.10	50.26
11	6.19	3.52	7.09	6.13	4.97	3.29	0.76	0.25	1.37	4.12	M6.26	3.20	47.15
12	7.33	4.06	6.81	4.71	4.28	3.32	1.80	0.00	0.11	6.60	6.48	M7.76	53.26
13		M3.87	M4.03	M5.06	M4.98	M2.31	M0.00	M0.00	M4.85	M4.17	M4.11	M1.74	35.12
14	M4.52	M6.75	M9.81	M4.54	M3.46	M1.36	M1.27	M1.26	M3.07	M6.49	M5.51	M6.89	54.93
15	M4.28	M3.91	M4.15	M1.75	M0.80								14.89

Product generated by ACIS - NOAA Regional Climate Centers.

This page intentionally left blank for printing purposes.

Appendix D – Existing Wetland Mapping

This page intentionally left blank for printing purposes.



U.S. Fish and Wildlife Service National Wetlands Inventory

Salmon Springs Transmission Main

Mar 19, 2015



Wetlands

- Freshwater Emergent
- Freshwater Forested/Shrub
- Estuarine and Marine Deepwater
- Estuarine and Marine
- Freshwater Pond
- Lake
- Riverine
- Other

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

User Remarks:

This page intentionally left blank for printing purposes.



City of Sumner
Wetland Inventory
Map, 2007

Scale:

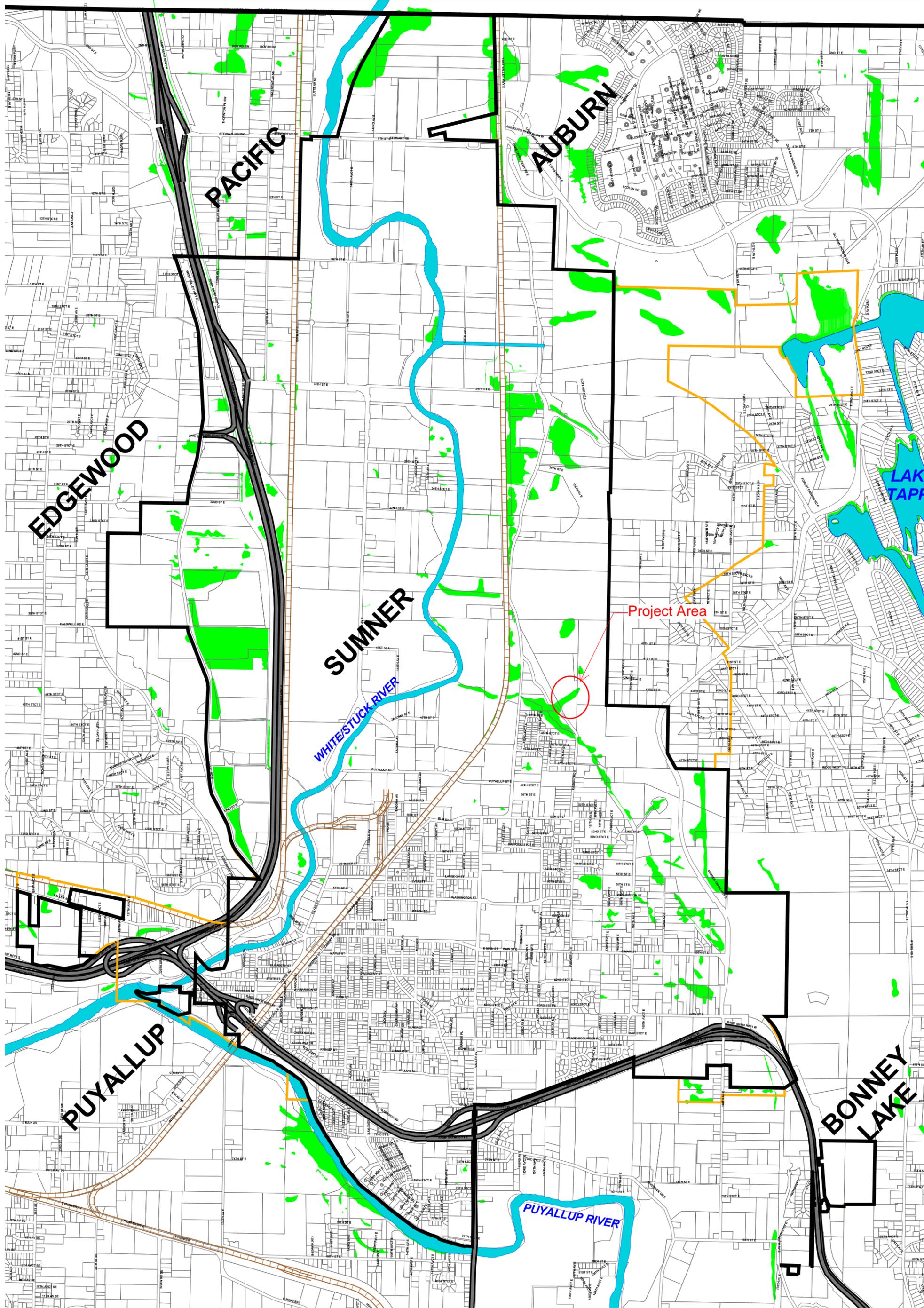
0 1000 2000 3000 Feet

LEGEND:

- Sumner City Limits
- Sumner UGA
- Parcels
- Wetlands
- Wetlands, March 2007



EXHIBIT A



This page intentionally left blank for printing purposes.

Appendix E – Wetland Rating Forms

This page intentionally left blank for printing purposes.

Wetland name or number A

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Wetland A Date of site visit: 4/8/15
 Rated by Jason Cade, Widener and Associates Trained by Ecology? Yes No Date of training _____
 HGM Class used for rating Slope Wetland has multiple HGM classes? Y N

NOTE: Form is not complete without the figures requested (figures can be combined).
 Source of base aerial photo/map 2013 National Agriculture Imagery Program

OVERALL WETLAND CATEGORY _____ (based on functions _____ or special characteristics _____)

1. Category of wetland based on FUNCTIONS

- _____ Category I – Total score = 23 - 27
- _____ Category II – Total score = 20 - 22
- Category III – Total score = 16 - 19
- _____ Category IV – Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
<i>Circle the appropriate ratings</i>				
Site Potential	H (M) L	H (M) L	H (M) L	
Landscape Potential	H M (L)	H M (L)	H (M) L	
Value	(H) M L	(H) M L	(H) M L	TOTAL
Score Based on Ratings	6	6	7	19

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

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

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	I II
Wetland of High Conservation Value	I
Bog	I
Mature Forest	I
Old Growth Forest	I
Coastal Lagoon	I II
Interdunal	I II III IV
None of the above	

Wetland name or number 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	1
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	1
Hydroperiods	H 1.2	2
Plant cover of dense trees, shrubs, and herbaceous plants	S 1.3	2
Plant cover of dense, rigid trees, shrubs, and herbaceous plants (<i>can be added to figure above</i>)	S 4.1	3
Boundary of 150 ft buffer (<i>can be added to another figure</i>)	S 2.1, S 5.1	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	4
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	5
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	6

Wetland name or number A

HGM Classification of Wetlands in Western Washington

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

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

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

NO - go to 2

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

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

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

YES - **Freshwater Tidal Fringe**

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

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

NO - go to 3

YES - The wetland class is **Flats**

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

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

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

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

NO - go to 4

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

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

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

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

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

NO - go to 5

YES - The wetland class is **Slope**

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

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

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

The overbank flooding occurs at least once every 2 years.

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

SLOPE WETLANDS	
Hydrologic Functions - Indicators that the site functions to reduce flooding and stream erosion	
S 4.0. Does the site have the potential to reduce flooding and stream erosion?	
<p>S 4.1. Characteristics of plants that reduce the velocity of surface flows during storms: Choose the points appropriate for the description that best fits conditions in the wetland. <i>Stems of plants should be thick enough (usually > 1/8 in), or dense enough, to remain erect during surface flows.</i></p> <p>Dense, uncut, rigid plants cover > 90% of the area of the wetland points = <u>1</u></p> <p>All other conditions points = 0</p>	<u>1</u>
<p>Rating of Site Potential If score is: <input checked="" type="checkbox"/> 1 = M <input type="checkbox"/> 0 = L <i>Record the rating on the first page</i></p>	

S 5.0. Does the landscape have the potential to support the hydrologic functions of the site?	
<p>S 5.1. Is more than 25% of the area within 150 ft upslope of wetland in land uses or cover that generate excess surface runoff?</p> <p>Yes = 1 <input checked="" type="radio"/> No = 0</p>	<u>0</u>
<p>Rating of Landscape Potential If score is: <input type="checkbox"/> 1 = M <input checked="" type="checkbox"/> 0 = L <i>Record the rating on the first page</i></p>	

S 6.0. Are the hydrologic functions provided by the site valuable to society?	
<p>S 6.1. Distance to the nearest areas downstream that have flooding problems:</p> <p>The sub-basin immediately down-gradient of site has flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds) points = <u>2</u></p> <p>Surface flooding problems are in a sub-basin farther down-gradient points = 1</p> <p>No flooding problems anywhere downstream points = 0</p>	<u>2</u>
<p>S 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan?</p> <p>Yes = 2 <input checked="" type="radio"/> No = 0</p>	<u>0</u>
<p>Total for S 6</p>	<u>2</u>
<p>Rating of Value If score is: <input checked="" type="checkbox"/> 2-4 = H <input type="checkbox"/> 1 = M <input type="checkbox"/> 0 = L <i>Record the rating on the first page</i></p>	

NOTES and FIELD OBSERVATIONS:

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

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 ft².

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

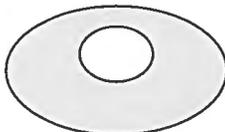
1

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.*



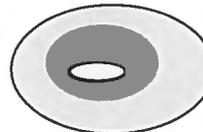
None = 0 points



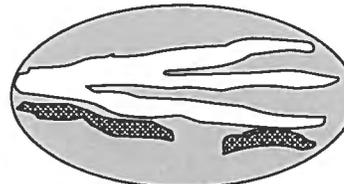
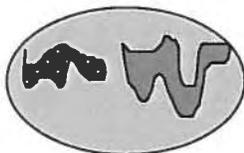
Low = 1 point



Moderate = 2 points



All three diagrams in this row are HIGH = 3points



3

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 checked="" type="checkbox"/> Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long).</p> <p><input type="checkbox"/> Standing snags (dbh > 4 in) within the wetland</p> <p><input type="checkbox"/> Undercut banks are present for at least 6.6 ft (2 m) and/or overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m)</p> <p><input type="checkbox"/> Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present (<i>cut shrubs or trees that have not yet weathered where wood is exposed</i>)</p> <p><input checked="" type="checkbox"/> At least 1/4 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 checked="" 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>		3
Total for H 1	Add the points in the boxes above	13

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: % undisturbed habitat 37.4 + [(% moderate and low intensity land uses)/2] <u>1.2</u> = <u>28.2</u> %</p> <p>If total accessible habitat is:</p> <p>> 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>< 10% of 1 km Polygon points = 0</p>		2
<p>H 2.2. Undisturbed habitat in 1 km Polygon around the wetland.</p> <p>Calculate: % undisturbed habitat 32.1 + [(% moderate and low intensity land uses)/2] <u>1.2</u> = <u>33.3</u> %</p> <p>Undisturbed habitat > 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 > 3 patches points = 1</p> <p>Undisturbed habitat < 10% of 1 km Polygon points = 0</p>		1
<p>H 2.3. Land use intensity in 1 km Polygon: If</p> <p>> 50% of 1 km Polygon is high intensity land use points = (- 2)</p> <p>≤ 50% of 1 km Polygon is high intensity points = 0</p>		-2
Total for H 2	Add the points in the boxes above	1

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

<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: points = 2</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 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*

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.

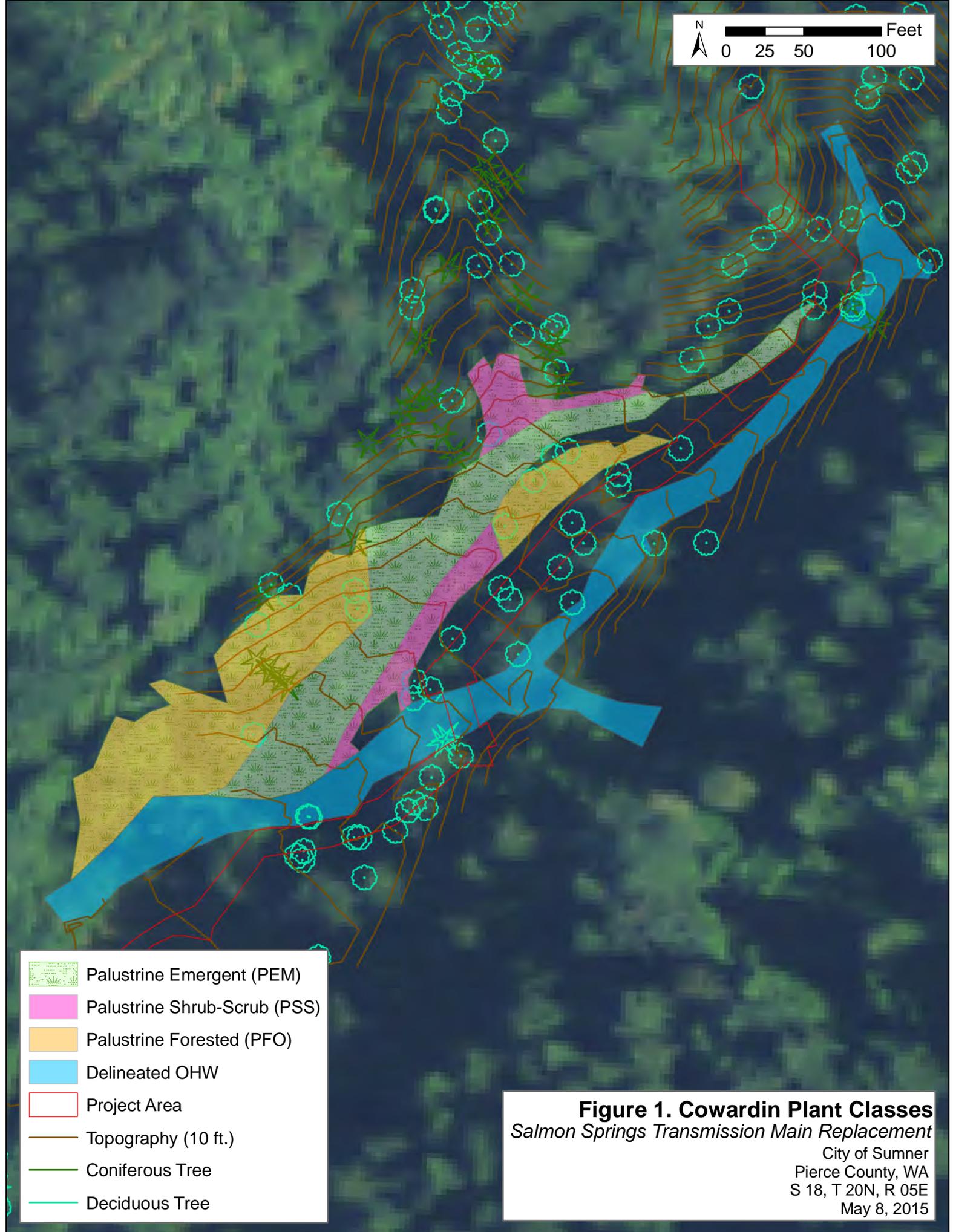
Wetland name or number A

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type	Category
<p><i>Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.</i></p>	
<p>SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt Yes – Go to SC 1.1 No – Not an estuarine wetland</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? Yes = Category I No - Go to SC 1.2</p>	<p>Cat. I</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? — 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) — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or unmowed grassland. — The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = Category I No = Category II</p>	<p>Cat. I Cat. II</p>
<p>SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? Yes – Go to SC 2.2 No – Go to SC 2.3 SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes = Category I No = Not a WHCV SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf Yes – Contact WNHP/WDNR and go to SC 2.4 No = Not a WHCV SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? Yes = Category I No = Not a WHCV</p>	<p>Cat. I</p>
<p>SC 3.0. Bogs 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> SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? Yes – Go to SC 3.3 No – Go to SC 3.2 SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes – Go to SC 3.3 No = Is not a bog SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? Yes = Is a Category I bog No – Go to SC 3.4 NOTE: If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? Yes = Is a Category I bog No = Is not a bog</p>	<p>Cat. I</p>

Wetland name or number _____

This page left blank intentionally

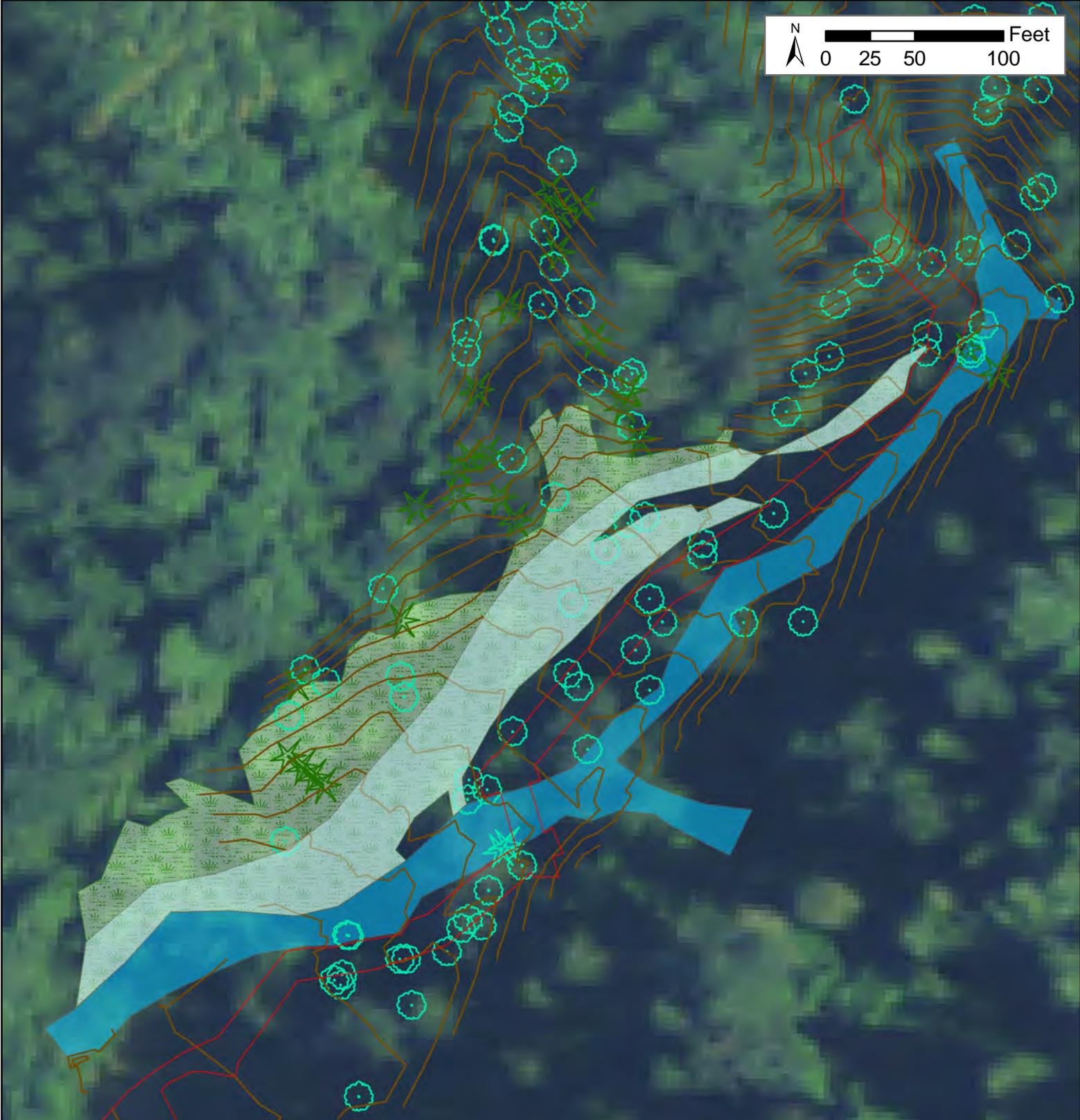
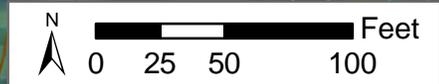


N
0 25 50 100 Feet

-  Palustrine Emergent (PEM)
-  Palustrine Shrub-Scrub (PSS)
-  Palustrine Forested (PFO)
-  Delineated OHW
-  Project Area
-  Topography (10 ft.)
-  Coniferous Tree
-  Deciduous Tree

Figure 1. Cowardin Plant Classes
Salmon Springs Transmission Main Replacement
 City of Sumner
 Pierce County, WA
 S 18, T 20N, R 05E
 May 8, 2015

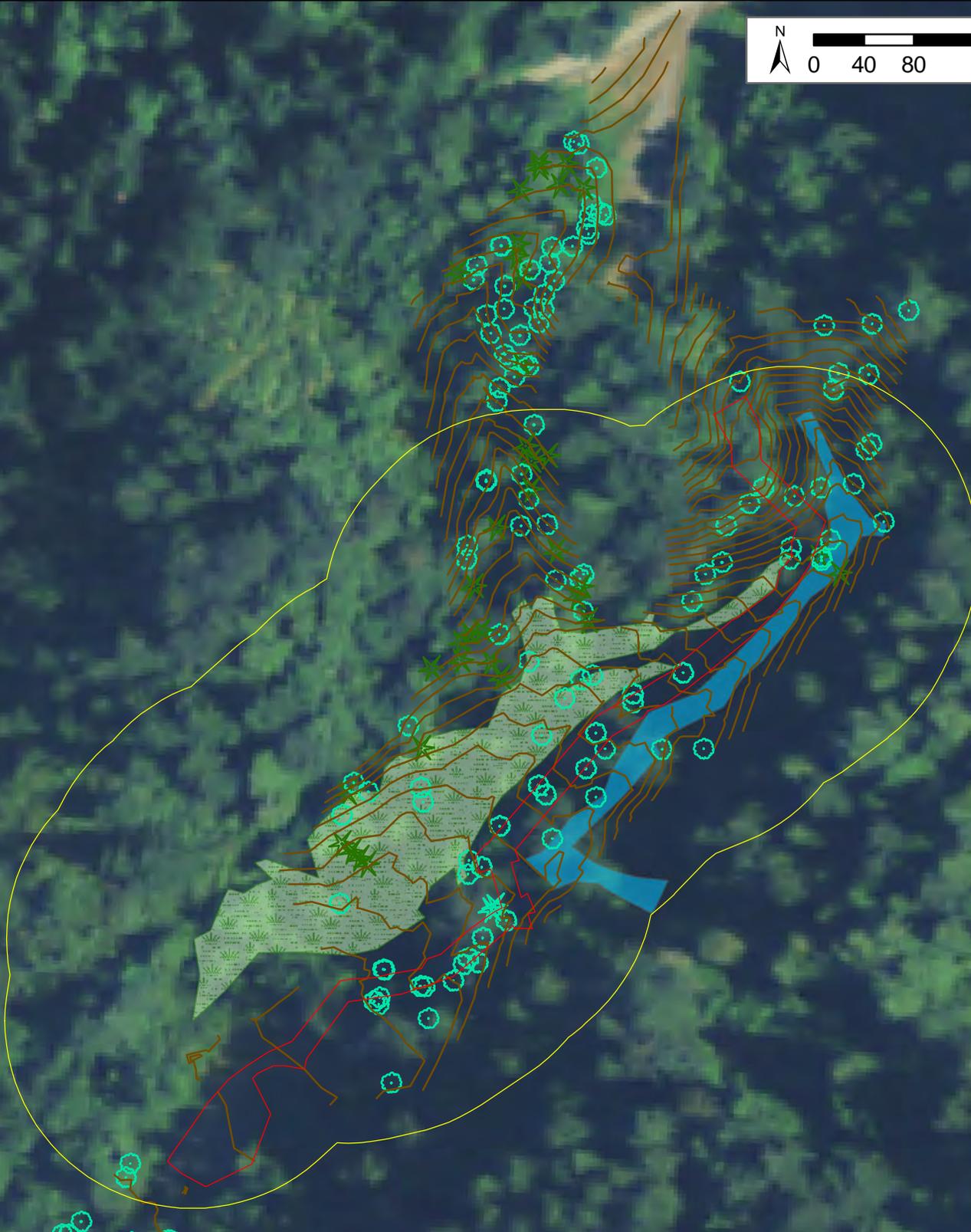
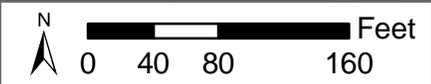
This page intentionally left blank for printing purposes.



-  Saturated Only
-  Seasonally Flooded or Inundated
-  Delineated OHW
-  Project Area
-  Topography (10 ft.)
-  Coniferous Tree
-  Deciduous Tree

Figure 2. Hydroperiods
Salmon Springs Transmission Main Replacement
 City of Sumner
 Pierce County, WA
 S 18, T 20N, R 05E
 May 8, 2015

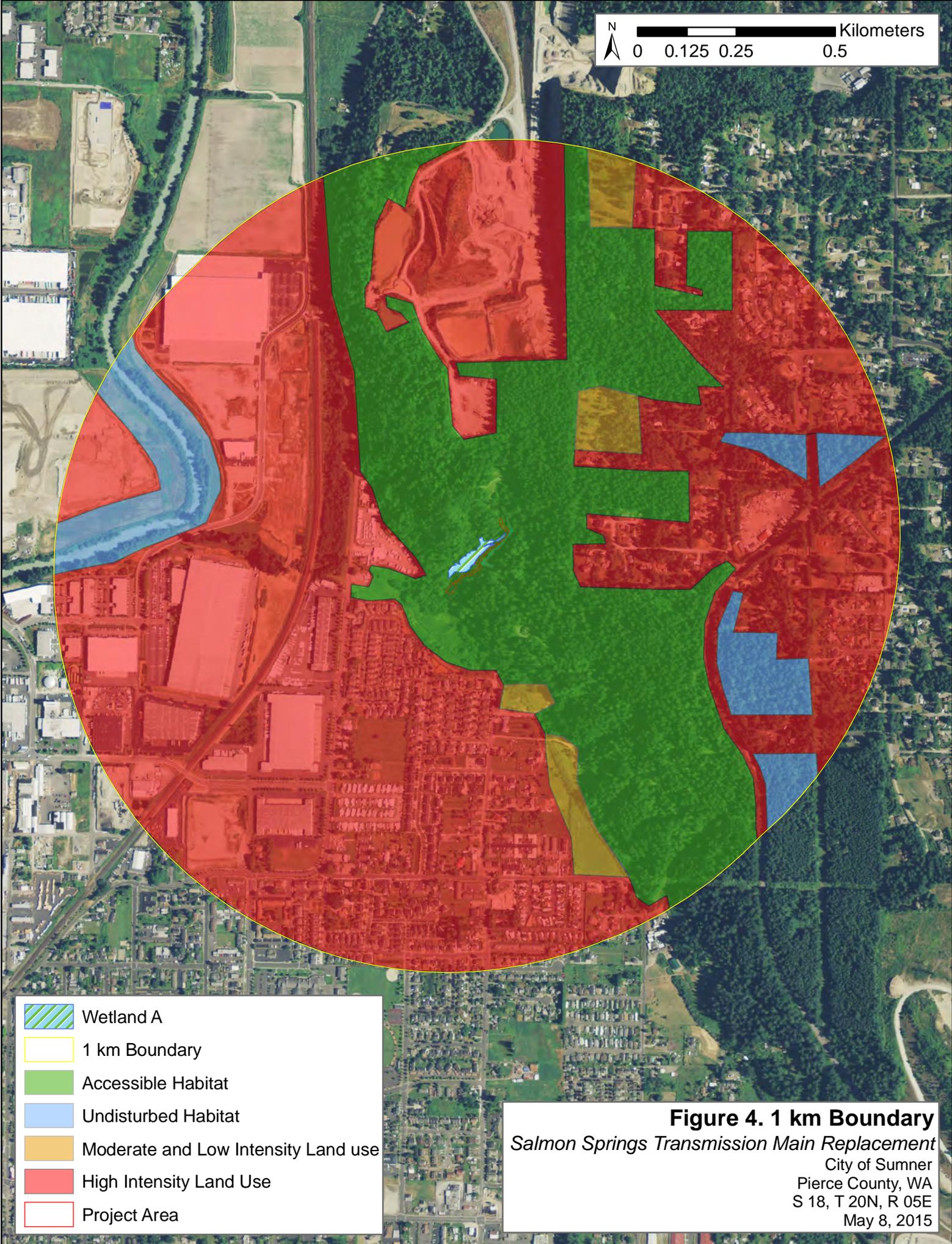
This page intentionally left blank for printing purposes.



- Dense/Rigid Plant Cover
- 150 ft. Wetland Boundary
- Delineated OHW
- Project Area
- Topography (10 ft.)
- Coniferous Tree
- Deciduous Tree

Figure 3. Dense/Rigid Plant Cover
Salmon Springs Transmission Main Replacement
City of Sumner
Pierce County, WA
S 18, T 20N, R 05E
May 8, 2015

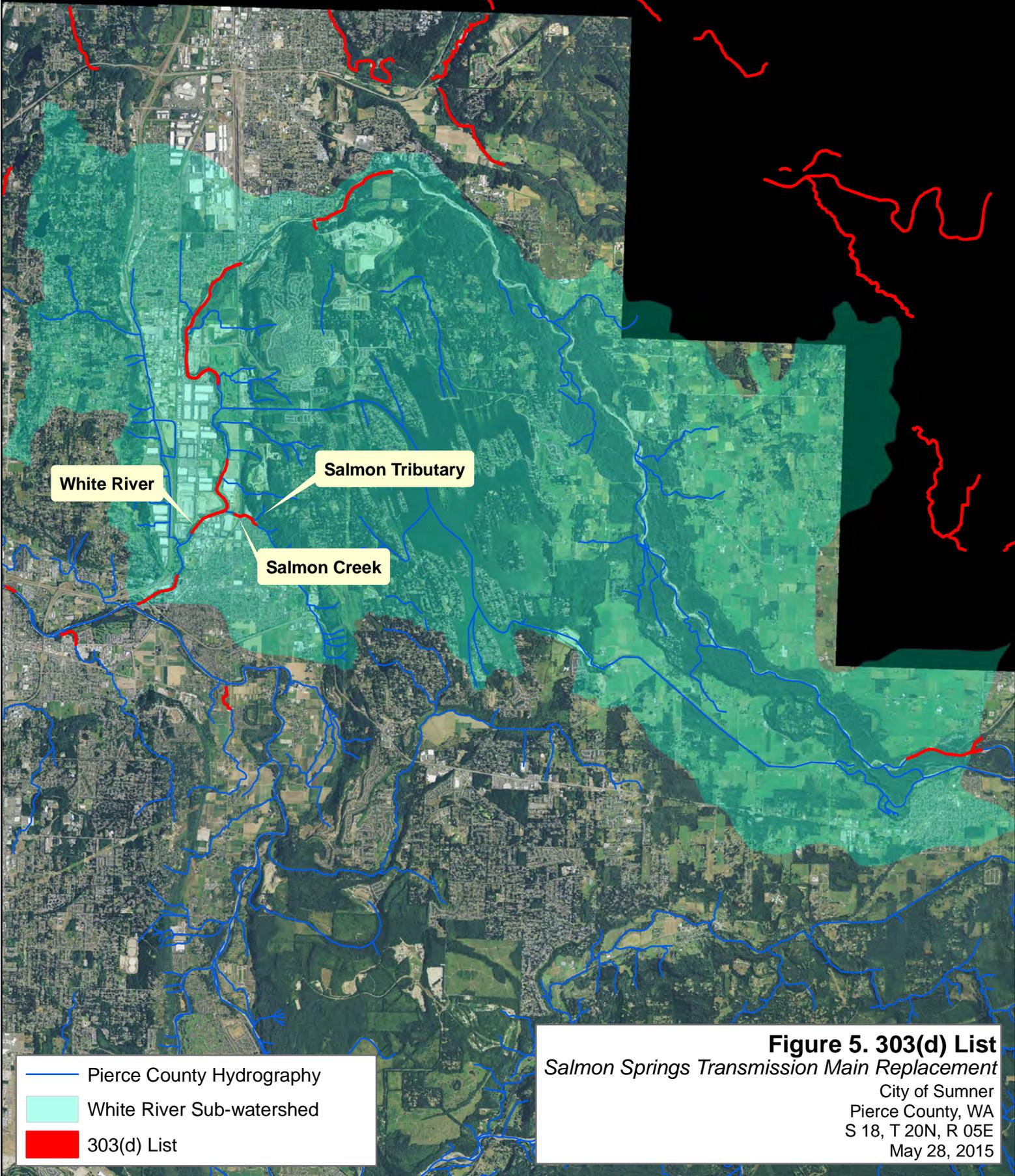
This page intentionally left blank for printing purposes.



-  Wetland A
-  1 km Boundary
-  Accessible Habitat
-  Undisturbed Habitat
-  Moderate and Low Intensity Land use
-  High Intensity Land Use
-  Project Area

Figure 4. 1 km Boundary
Salmon Springs Transmission Main Replacement
City of Sumner
Pierce County, WA
S 18, T 20N, R 05E
May 8, 2015

This page intentionally left blank for printing purposes.



- Pierce County Hydrography
- White River Sub-watershed
- 303(d) List

Figure 5. 303(d) List
Salmon Springs Transmission Main Replacement
City of Sumner
Pierce County, WA
S 18, T 20N, R 05E
May 28, 2015

This page intentionally left blank for printing purposes.

Figure 6. WRIA 10 TMDLs

Water Quality Improvement Projects (TMDLs)

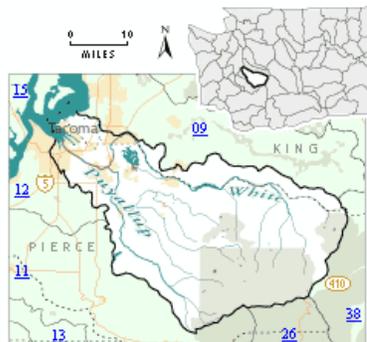
[Water Quality Improvement](#) > [Water Quality Improvement Projects by WRIA](#) > WRIA 10: Puyallup-White

WRIA 10: Puyallup-White

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

Counties

- [King County](#)
- [Pierce County](#)



Waterbody Name	Pollutant	Status**	TMDL Leads
Clarks Creek Meeker Creek	Dissolved Oxygen Sediment	Submitted to EPA for approval	Brett Raunig 360-690-4660
	Fecal Coliform	Approved by EPA Has an implementation plan	
Commencement Bay	Dioxin	Approved by EPA	Donovan Gray 360-407-6407
Puyallup River Watershed	Fecal Coliform	Approved by EPA	Donovan Gray 360-407-6407
	Multi-parameter Ammonia-N BOD (5-day)	Approved by EPA	
	White River Watershed Upper White: <ul style="list-style-type: none"> • Sediment • Temperature Lower White <ul style="list-style-type: none"> • pH 	Approved by EPA Under Development	
South Prairie Creek Tributary: Wilkeson/Gale Creek	Fecal Coliform Temperature	Approved by EPA Has an implementation plan	Donovan Gray 360-407-6407

** **Status** will be listed as one of the following: *Approved by EPA, Under Development or Implementation*

For more information about WRIA 10:

- [Waterbodies in WRIA 10](#) - using the Water Quality Assessment Query Tool
- [Watershed Information for WRIA 10](#)

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

[Back to top of page](#)

Last updated December 2014

Copyright © Washington State Department of Ecology. See <http://www.ecy.wa.gov/copyright.htm>

This page intentionally left blank for printing purposes.