



Critical Areas Report and Mitigation Plan

Sultan River Engineered Log Jams 9 and 10



**Prepared for
Snohomish County Public Utility District No. 1**

**Prepared by
Herrera Environmental Consultants, Inc.**

Critical Areas Report and Mitigation Plan

Sultan River Engineered Log Jams 9 and 10 Snohomish County, Washington

Prepared for
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Disclaimer

Herrera prepared this report for use by Snohomish County Public Utility District No. 1 (PUD) in support of the Sultan River Engineered Log Jams 9 and 10 Project. The results and conclusions in this report represent the professional opinion of Herrera Environmental Consultants, Inc. They are based upon examination of public domain information concerning the study area, site investigation, and data analysis.

The wetland delineation was performed according to accepted standards in the field of jurisdictional wetland determination and delineation, using the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Western Mountains, Valleys, and Coast Region* (Environmental Laboratory 2010). Stream and lake boundaries were determined using *Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State* (Anderson et al. 2016). However, final determination of jurisdictional wetland boundaries pertinent to Section 404 of the Clean Water Act is the responsibility of the Seattle District of the U.S. Army Corps of Engineers. Various agencies of the State of Washington and local jurisdictions may require a review of final site development plans that could potentially affect zoning, critical areas, buffer requirements, water quality, or habitat functions of lands in question. Therefore, the findings and conclusions in this report should be reviewed by appropriate regulatory agencies before any detailed site planning or construction activities.

Herrera Qualifications

Established in 1980, Herrera Environmental Consultants, Inc. (Herrera) is an innovative, employee-owned, consulting firm focused on three practice areas: water, restoration, and sustainable development. The following staff authored this report and conducted field work in support of its findings. A summary of their qualifications is provided.

Danielle Rapoza, PWS

Danielle Rapoza is an ecologist with 11 years of experience in fisheries research, restoration monitoring, water quality assessment, and flow monitoring. Danielle is involved in pre- and post-restoration monitoring efforts on stream and wetland projects. Danielle is trained in biological assessments, wetland delineation, functional wetland assessment, the policy framework, and summarizing results in reports.

Credentials

- BA Planning and Environmental Policy, Western Washington University, Bellingham, 2007
- Certificate in Wetland Science and Management, University of Washington, Seattle, 2018
- WSDOT Junior Biological Assessment Author, 2026
- Certified Professional Wetland Scientist (PWS) #3410, Society of Wetland Scientists, 2021

Liliana Hansen, PWS

Liliana is a senior scientist with 18 years of professional experience in wetland, stream, and shoreline delineations; floodplain habitat assessments; native plant identification; biological evaluations and assessments; shoreline assessments; mitigation/restoration design; and mitigation monitoring. She is experienced with project management and permitting projects at the local, state, and federal levels. She has conducted hundreds of critical areas delineations in Washington and led projects from initial stages of field work through permitting and 10 years of successful mitigation performance monitoring.

Credentials

- BS Environmental Science, Western Washington University, Bellingham, 2003
- Certified PWS #2755, Society of Wetland Scientists, 2016
- Wetland Delineation Certification, Portland State University, 2004
- Wetland and Upland Habitat Restoration Design, Portland State University, 2004

Introduction

Herrera Environmental Consultants, Inc. (Herrera) performed the wetland delineation, ordinary high water mark (OHWM) determinations, and mitigation planning described in this report for Snohomish County Public Utility District No. 1 (PUD), in support of the Sultan River Engineered Log Jams (ELJs) 9 and 10 Project (Project). The proposed project involves installing two ELJs along the right bank (west side) of the Sultan River in Snohomish County, Washington. This work represents the PUD's ongoing mitigation as a component of the Federal Energy Regulatory Commission license (Project No. 2157) for the Henry M. Jackson Hydroelectric Project and is intended to improve instream habitat for salmon in the Sultan River watershed. Project construction and staging will utilize existing roads/paths and minimally vegetated areas to the extent practicable in order to minimize impacts to riparian vegetation and other natural resources. No new permanent access corridors are proposed.

Areas within approximately 300 feet of the proposed ELJ locations were investigated for the presence of wetlands, streams, and fish and wildlife habitat conservation areas (Figure 1). The results of the site investigation, including descriptions of existing environmental conditions; wetlands; streams; applicable protective buffer widths; and relevant local, state, and federal regulations, are provided in the following sections.

Study Area

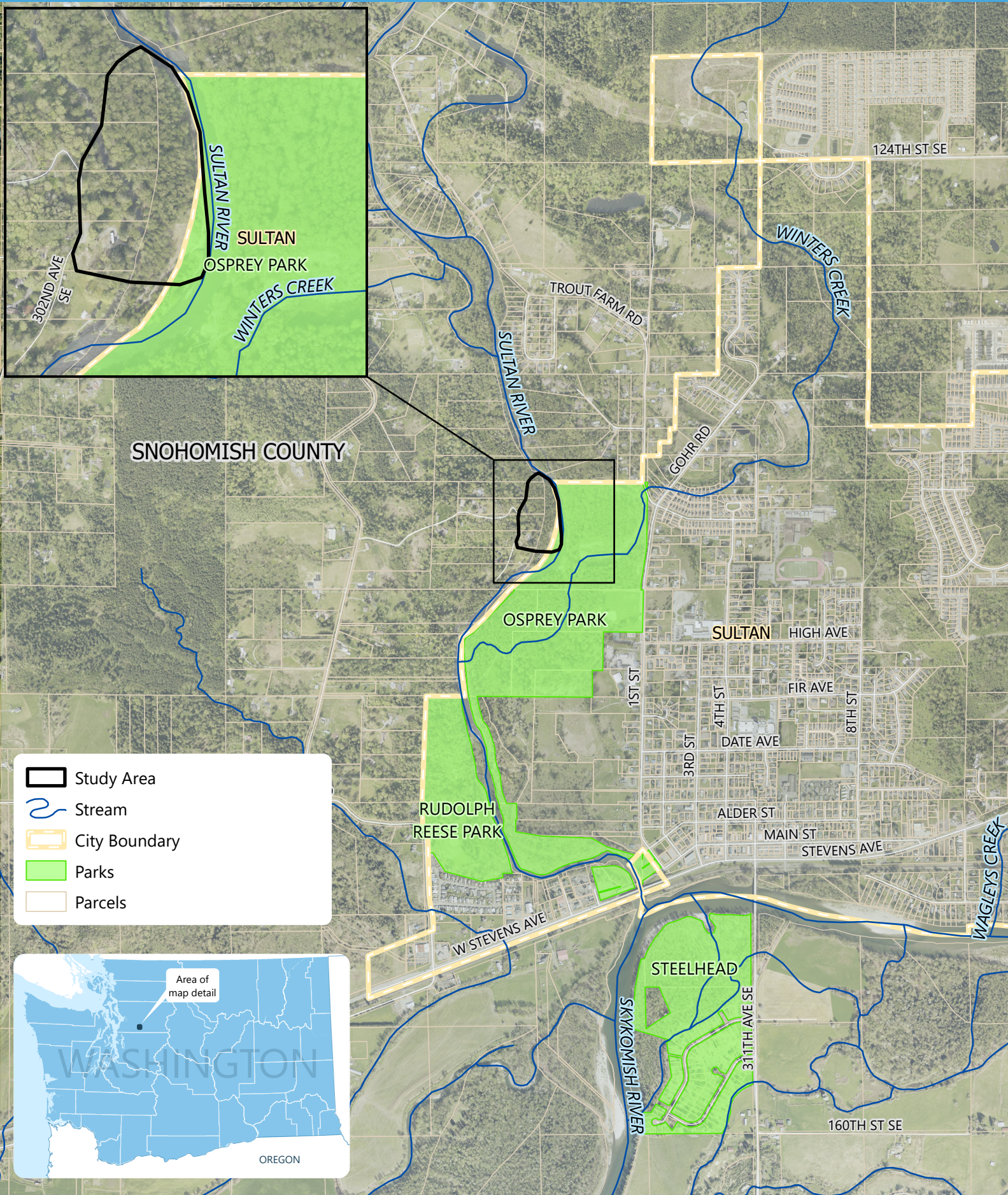
The study area is in the Lower Sultan River subbasin within the Snohomish Watershed, in Watershed Resource Inventory Area (WRIA) 7 – Snohomish, within the northeast portion of Section 31, Township 28 North, Range 08 East of the Willamette Meridian, in Snohomish County, Washington. The proposed project, identified as the study area in Figure 1, is situated within seven Snohomish County parcels on the west side of the Sultan River: 28083100100900, 28083100101100, 28083100101200, 28083100101300, 28083100100800, 28083100101600, and 00765600099900. Although a small portion of the eastern project area is located within Sultan city limits, the Director of Community Development communicated to the project team that Snohomish County would be the Authority Having Jurisdiction over the project (M. Newman, City of Sultan, personal communication, February 23, 2026). Historically, the eastern boundary of the Sultan River defined the County/City boundary along a defined tax parcel line within the study area. River migration led to a shift in the river to the east, while the original parcel lines remained the same, resulting in a small upland/gravel bar and portion of the river shifting within Sultan city limits.

Study Objectives

The objectives of this study are to document critical areas reporting requirements in accordance with Snohomish County Code (SCC) 30.62A.140, including the following:

- Identify wetlands and delineate wetland boundaries within 300 feet of the proposed work.
- Rate wetlands to determine required buffer widths as established by SCC 30.62A Part 300.
- Delineate (flag) the OHWM of the Sultan River and Side Channel 2 and classify these features in accordance with SCC 30.62A Part 300.
- Identify applicable buffers, regulations, and guidance pertinent to other critical areas on site, such as Fish and Wildlife Habitat Conservation Areas (FWHCAs) (SCC 30.62A Part 200).
- Identify regulations and mitigation requirements pertinent to the Snohomish County's Shoreline Management Program (SMP) (SCC 30.67) and Critical Areas Ordinance SCC30.62A Part 300.

Figure 1.
Vicinity Map of Study Area.



Laws and Regulations

Wetlands and streams are subject to a variety of federal, state, and local regulations. Federal laws regulating wetlands and streams include Sections 404 and 401 of the Clean Water Act (United States Code, Title 33, Chapter 1344 [33 USC 1344]). However, temporary disturbance to waters of the United States (streams and wetlands) could occur with this project; therefore, the Project will require review under the Clean Water Act. Washington State laws and programs designed to control the loss of wetland acreage and waters of the State include the State Environmental Policy Act (SEPA), the State Hydraulic Code (WAC 220-110), and the Washington State Water Pollution Control Act (RCW 90.48). Federal laws regulating habitat and species include Sections 404 and 401 of the Clean Water Act (USC Title 33, Chapter 1344 [33 USC 1344]), the Endangered Species Act (ESA) (16 USC 1531), the Bald and Golden Eagle Protection Act (16 USC 668–668c), and the Migratory Bird Treaty Act (16 USC 703–712).

The Sultan River is a Shoreline of the State and is therefore subject to Shoreline Management Act regulations (RCW 90.58.065) and regulations per the Snohomish County's SMP. The associated shoreline jurisdiction applies to all uplands 200 feet landward of the OHWM of the river, the 100-year floodplain and floodway, and all wetlands in the 100-year floodplain (SCC 30.91S.181). All proposed modifications or development in shoreline jurisdiction must be designed to achieve no net loss of ecological functions as defined in WAC 173-26-201(3)(d)(i)(C).

Critical areas located within shoreline jurisdiction are subject to the regulations contained in SCC 30.62A. Critical areas are defined as the following in the County's Critical Areas Ordinance (CAO): critical aquifer recharge areas, fish and wildlife habitat conservation areas, frequently flooded areas, geologically hazardous areas, and wetlands.

Methods

Herrera conducted a review of available information within the study area prior to the site visit. The following sections describe the research methods and field protocols for the wetland and stream evaluations. Appendix A includes more information about the methodology used in the wetland delineation performed for this project.

Review of Available Information

Herrera reviewed publicly available resources for supporting critical areas information within the study area. Sources of information include the following:

- Snohomish County Planning and Development Services (PDS) mapping (Snohomish County 2026)
- National Wetlands Inventory (NWI) map (USFWS 2017)
- Precipitation and climate data (NRCS 2026a)
- Hydrograph data for the Sultan River (USGS 2026, USGS [n.d.])
- Soil survey maps and soil series descriptions (NRCS 2026b, 2026c)
- Washington Department of Natural Resources (WDNR) Official Water Type Reference maps (2026a)
- WDNR Natural Heritage Program mapping data (2026b)
- Statewide Washington Integrated Fish Distribution and SalmonScape mapping (Washington Department of Fish and Wildlife [WDFW] and Northwest Indian Fisheries Commission [NWIFC] 2026, WDFW 2026a)
- Washington State Priority Habitat and Species (PHS) (WDFW 2026b),
- U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) (USFWS 2026)
- National Marine Fisheries Service, Species and Habitat App (NMFS 2026)

Wetland Delineation

Herrera conducted the wetland delineation in accordance with the *Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Western Mountains, Valleys, and Coast Region* (Environmental Laboratory 2010), which is consistent with the *1987 Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987). The methods in these guidance manuals use a three-parameter approach for identifying and delineating wetlands and rely on the presence of field indicators for hydrophytic vegetation, hydric soils, and hydrology. The detailed methods for evaluating these three parameters and for performing the wetland delineation are described in Appendix A. Test plots were

established to document conditions in wetlands and in adjacent uplands. For each test plot, data on dominant plant species, soil conditions, and evidence of hydrologic conditions were recorded on wetland determination data forms (Appendix B).

Wetland boundaries were flagged in the field with bright colored flagging and labeled sequentially (e.g., A-1, A-2, etc.). Wetland boundaries were subsequently located with an Eos Skadi 100 GNSS GPS receiver with sub-meter accuracy.

Hydrology Analysis

Analyzing climatic conditions and local weather patterns is important in the assessment of vegetation, soil conditions, and hydrology for wetland delineations (Environmental Laboratory 1987, 2010), and information on precipitation that precedes a site visit is valuable in helping determine whether conditions observed at a site are reflective of normal rainfall. The Natural Resources Conservation Service (NRCS) methodology for the analysis of normal environmental conditions was used to analyze conditions prior to the site visit (NRCS 1997; see Appendix A for additional methodology description). The U.S. Army Corps of Engineers Antecedent Precipitation Tool was used for this analysis (USACE 2025).

Hydrograph data for the Sultan River below the diversion dam near Sultan, WA, (U.S. Geological Survey station 12137800) was consulted to determine the range of normal flows relative to recent flood events, and current OHWM indicators observed in the field.

Classification

Wetlands observed within the study area were classified according to the U.S. Fish and Wildlife Service classification system (FGDC 2013). This system is based on an evaluation of attributes, such as vegetation class, hydrologic regime, salinity, and substrate. The wetlands were also classified according to the HGM system, which is based on an evaluation of attributes such as the position of the wetland within the surrounding landscape, the source and location of water just before it enters the wetland, and the pattern of water movement in the wetland (Brinson 1993).

Rating and Functional Assessment

Wetlands were rated using *Washington State Wetland Rating System for Western Washington: 2014 Update, Version 2.0* (Hruby and Yahnke 2023), hereafter referred to as the "Ecology rating system." The Ecology rating system is required by SCC 30.62A.230. It categorizes wetlands according to specific attributes, such as rarity; sensitivity to disturbance; hydrologic, water quality, and habitat functions; and special characteristics (e.g., mature forested wetland, bog). The total score for all functions determines the wetland rating. The rating system consists of four categories, with Category I wetlands exhibiting outstanding functions and/or special characteristics and Category IV wetlands exhibiting minimal attributes and functions. The rating categories are used to identify permitted uses in a wetland and its buffer, to determine the buffer widths needed to protect a wetland from adjacent development, and to identify the mitigation ratios required to compensate for potential impacts on wetlands. Wetland rating forms are provided in Appendix C.

Wetland functions are those physical and chemical processes that occur within a wetland, such as the storage of water, cycling of nutrients, and maintenance of diverse plant communities and habitats that benefit wildlife. Wetland functions are grouped into three broad categories: water quality, hydrologic, and habitat.

- Water quality functions include the potential for removing sediment, nutrients, heavy metals, and toxic organic compounds in the water passing through the wetland.
- Hydrologic functions include reducing the velocity of stormwater, recharging and discharging groundwater, and providing flood storage.
- Habitat functions include providing food, water, and shelter for fish, shellfish, birds, amphibians, and mammals. Wetlands also serve as a breeding ground and nursery for numerous species.

Wetland functions were assessed using the Ecology rating system (Hruby and Yahnke 2023). This system generates a qualitative functional rating (high, moderate, or low) for each of the functions (water quality, hydrology, and habitat) provided by wetlands.

Stream Delineation

Herrera identified streams within the study area, in accordance with Washington Administrative Code (WAC) Section 222-16-010, as required by SCC 30.62A.140. According to the WAC definition, the OHWM of streams is *"that mark that will be found by examining the bed and banks and ascertaining where the presence and action of waters are so common and usual, and so long continued in all ordinary years, as to mark upon the soil a character distinct from that of the abutting upland, in respect to vegetation."* In addition, methods in the publication Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State (Anderson et al. 2016) were applied.

Stream OHWM boundaries were flagged in the field with bright colored flagging and labeled sequentially (e.g., OH-1, OH-2, etc.). Stream boundaries were subsequently located with an Eos Skadi 100 GNSS GPS receiver with sub-meter accuracy.

Fish and Wildlife Habitat Conservation Areas

Public databases were queried to identify mapped Fish and Wildlife Habitat Conservation Areas in the study area. Herrera biologists also conducted an on-site field assessment of habitats within the study area based on best professional judgement.

Other Critical Areas

The Snohomish County PDS Map Portal was consulted to identify critical areas within the study area (Snohomish County 2026). Herrera did not verify the accuracy or relevance of these identified areas. Further evaluation and reporting by qualified subject matter experts may be necessary.

Results of Desktop Review

The existing available information compiled for critical areas is summarized in the following subsections.

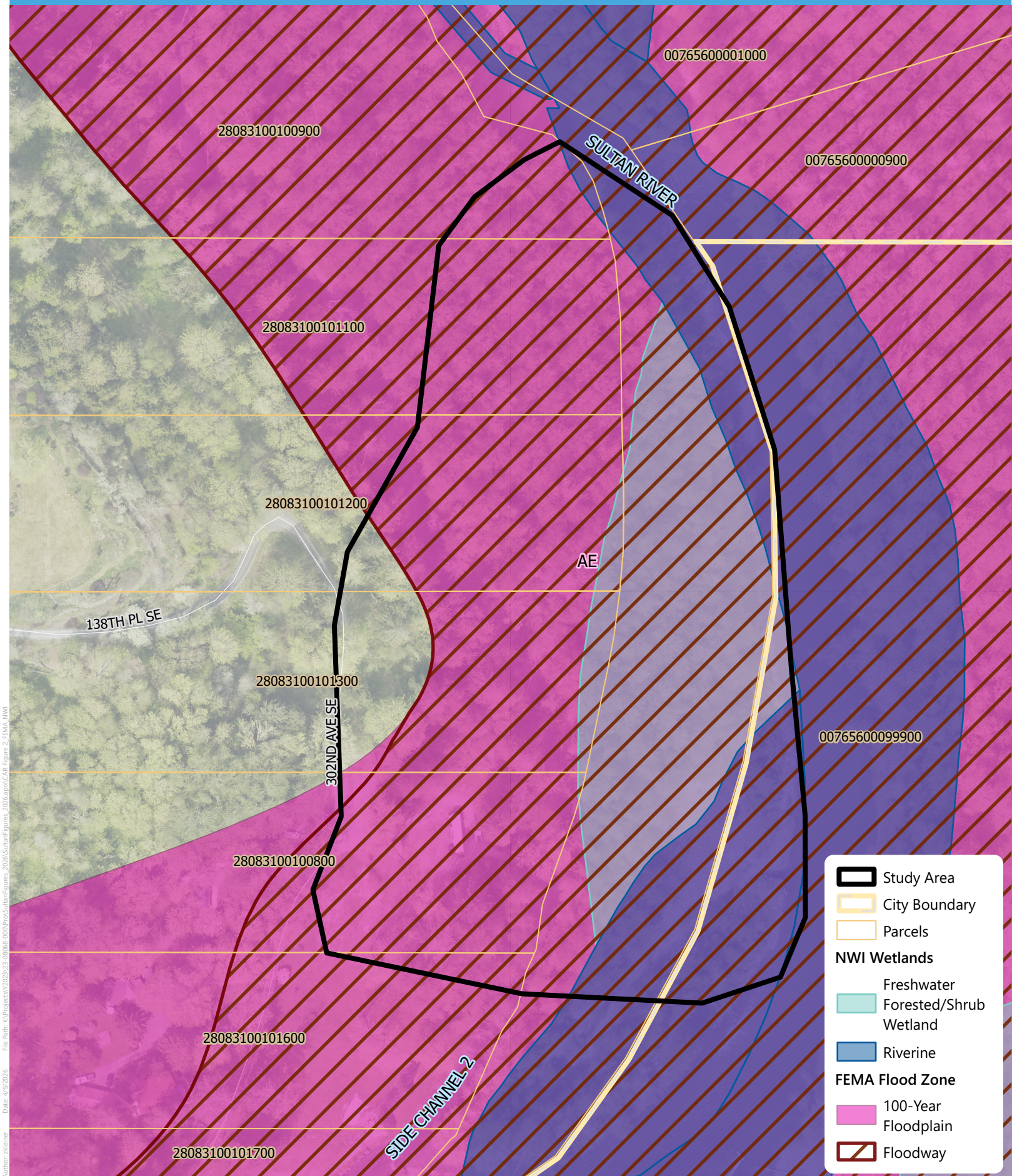
Mapped Wetlands and Streams

The National Wetland Inventory (NWI) maps seasonally flooded, forest/shrub wetlands between the Sultan River and Side Channel 2 (Figure 2) (USFWS 2017). Snohomish County maps this area as a “potential wetland” associated with shoreline jurisdiction (Snohomish County 2026). The shorelands associated with the study area are mapped as Rural Conservancy and Aquatic Shoreline Environments (Snohomish County 2026).

Precipitation Data

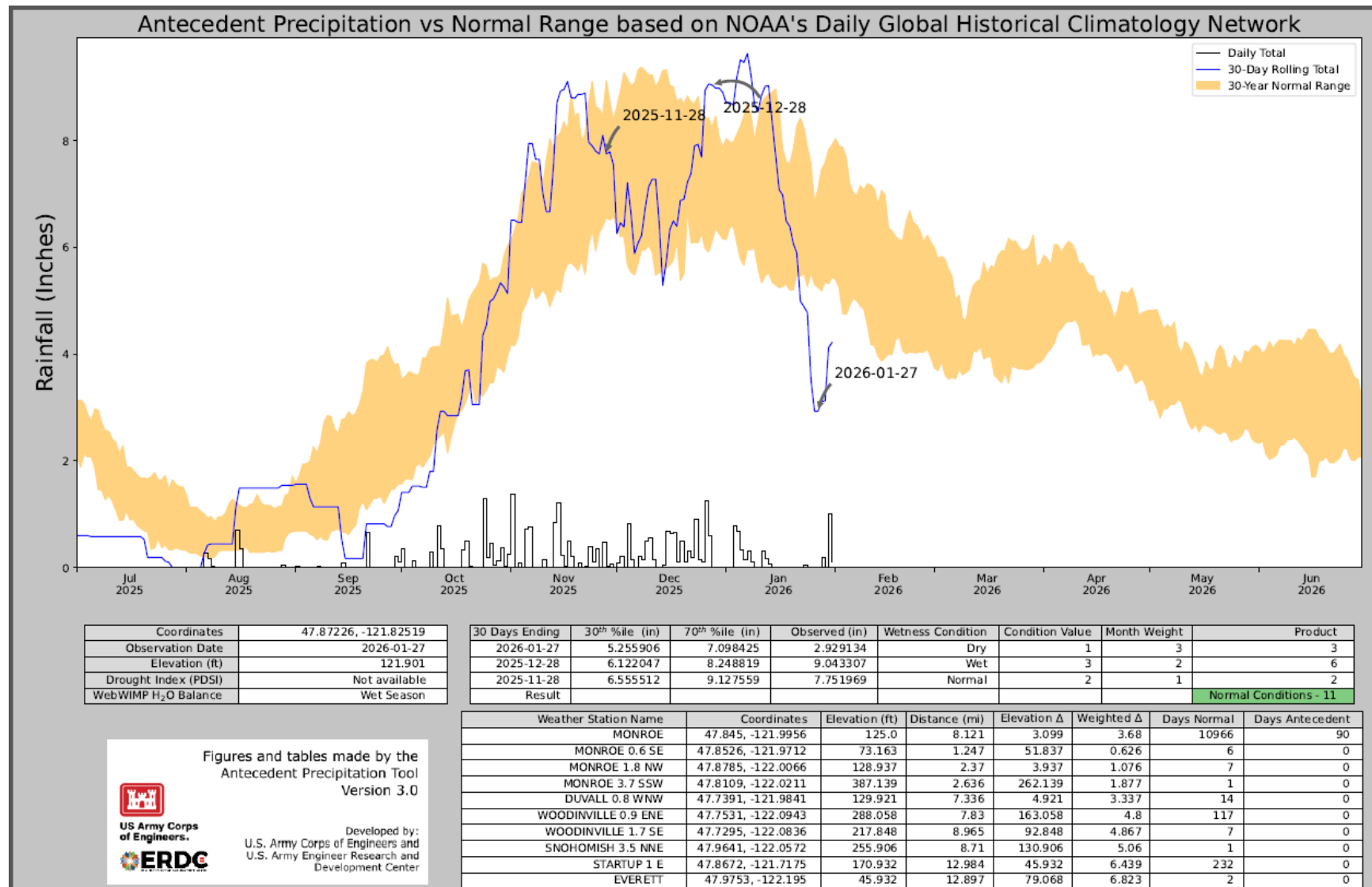
Precipitation was evaluated for the 3 months prior to field investigations, which occurred on January 27, 2026. In the 3 months preceding January field work, average precipitation in December, November, and October were all within the normal range of average (NRCS 2026a, USACE 2025) (Figure 3). There was no precipitation in the 10 days prior to the January field work (NRCS 2026a).

Figure 2.
Previously Mapped Wetlands and Flood Hazards.



File Path: K:\Projects\2023\23-08068-0000\Pro\SultanFigures_2026.aprx | Figure 2, FEMA, NWI
Date: 4/9/2026
Author: zblener

Figure 3. Antecedent Precipitation vs Normal Range Based on NOAA's Daily Global Historical Climatology Network.

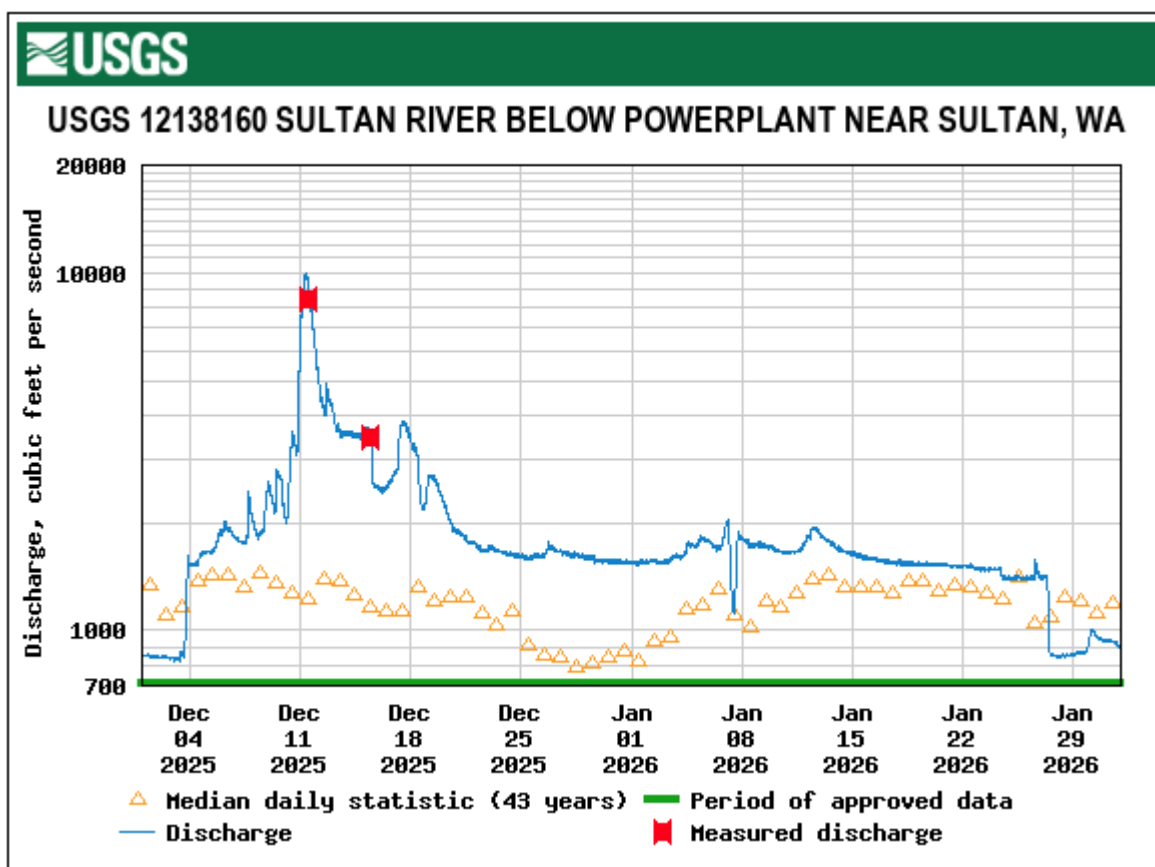


Source: USACE 2025

Hydrograph Data

Flooding in December 2025 exhibited flows well above the mean daily discharge as indicated by provisional data for USGS gauge 12138160, which is located less than 2 miles upriver of the study area (Figure 4) (USGS 2026). USGS data indicate that the 2-year flood return interval is 8,290 cubic feet per second, at the gauge location (USGS [n.d.]). Flows were between 851 and 1,270 cubic feet per second at the time of the site visit (USGS 2026). These data indicate that an approximately 2- to 5-year flood last occurred in December 2025, approximately 1 month prior to the site visit.

Figure 4. Hydrograph for USGS Station 12138160 for December 2025 through January 2026.



Source: USGS 2026

Mapped Soils

There are two soil series mapped within the study area (Appendix D) (NRCS 2026b, 2026c).

Pilchuck Loamy Sand

Pilchuck loamy sand (soil unit 50) is formed on flood plains from alluvium, and is not considered to be a hydric soil (NRCS 2025b, 2025c). Minor components within the study area include Puget, undrained, which is a hydric soil (NRCS 2026b, 2026c). A typical soil profile includes the following:

- 31-inch layer of loamy sand, very dark gray (10YR 3/1) to dark grayish brown (2.5Y 4/2)
- 19-inch layer of fine sand, very dark gray (10YR 3/1) and dark gray (10YR 4/1)
- 10-inch layer of gravelly sand, black (10YR 2/1) gravelly sand

Tokul-Winston Gravelly Loams

Tokul-Winston gravelly loams (soil unit 77) are formed on terrace escarpments and till plains from volcanic ash over basal till (NRCS 2026b, 2026c). Neither Tokul or Winston soils are considered to be hydric (NRCS 2026b, 2026c). A typical soil profile of Tokul includes the following:

- 4-inch layer of gravelly medial loam, dark brown (7.5YR 3/2)
- 18-inch layer of gravelly medial loam, brown (7.5YR 4/4) moist to dark yellowish brown (10YR 4/4)
- 9-inch layer of gravelly medial fine sandy loam, light olive brown (2.5Y 5/4)
- 29-inch layer of gravelly sandy loam, dark grayish brown (2.5Y 4/2)

A typical soil profile of Winston includes the following:

- 3-inch layer of gravelly ashy loam, dark brown (7.5YR 3/2)
- 22-inch layer of gravelly fine sandy loam, dark reddish brown (5YR 3/4) to dark brown (7.5YR 4/4)
- 35-inch layer of extremely gravelly course sand, dark brown (10YR 4/3) and dark grayish brown (10YR 4/2)

Fish and Wildlife Habitat Conservation Areas

The following FWHCAs, in accordance with SCC 30.62A.010, were identified on site: streams, primary association areas for critical species, and species and habitats (including WDFW PHS) of local importance.

Documented fish species include steelhead and rainbow trout (*Oncorhynchus mykiss*), Chinook (*O. tshawytscha*), coho (*O. kisutch*), chum (*O. keta*), pink (*O. gorbuscha*), resident coastal cutthroat (*O. clarkii*), and bull trout (*Salvelinus confluentus*) (WDFW and NWIFC 2065, WDFW 2026a, 2026b) (Table 1). The Puget Sound distinct population segment (DPS) of steelhead, Puget Sound evolutionary significant unit (ESU) of Chinook, and Coastal-Puget Sound DPS bull trout are listed as threatened under the Endangered Species Act (ESA). The Sultan River within the study area is designated critical habitat for all three species (NMFS 2026).

Table 1. Documented Fish Use in the Study Area.

Fish Species	Run	Use Type
Bull trout / Dolly Varden	NA	Rearing
Chinook	Summer	Presence
	Fall	Spawning
Chum	Fall	Spawning
Coastal cutthroat	NA	Presence
Coho	NA	Rearing
Pink	Odd year	Spawning
Steelhead	Summer	Presence
	Winter	Spawning
Rainbow trout	NA	Presence

Source: WDFW and NWIFC 2065, WDFW 2026a, 2026b

In addition to the fish mentioned above, the U.S. Fish and Wildlife Service (USFWS) maps several ESA-listed species in the study area (Table 2) (USFWS 2026). There are no designated critical habitats, other than those of the listed fish species, within the study area. A biological assessment will be conducted to facilitate impacts and mitigation associated with federal permits.

Table 2. ESA Species Mapped as Potentially Present in the Study Area.

Species	Scientific Name	Federal Status
North American wolverine	<i>Gulo gulo luscus</i>	Threatened
Marbled murrelet	<i>Brachyramphus marmoratus</i>	Threatened
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	Threatened
Northwestern pond turtle	<i>Actinemys marmorata</i>	Proposed threatened
Monarch butterfly	<i>Danaus plexippus</i>	Proposed threatened
Suckley's cuckoo bumble bee	<i>Bombus suckleyi</i>	Proposed endangered

Source: USFWS 2026

In addition to the fish species listed in this section, WDFW maps several masked polygons in the area for Priority Habitats and Species representing one or more records of the Northwestern pond turtle (*Actinemys marmorata*), little brown bat (*Myotis lucifugus*), and Yuma myotis (*Myotis yumanensis*) (WDFW 2026b).

Other Critical Areas

In addition to wetlands and FWHCAs, the study area is situated within the following mapped critical areas (Snohomish County 2026):

- **Aquifer Recharge:** High sensitivity to groundwater contamination.
- **Flood Hazard Zones:** FEMA Zone AE, including the 100-year floodplain and the regulatory floodway (Figure 2).
- **Geohazard – Seismic:** The study area is situated above the known path of the class B Sultan River fault line. The site falls into seismic classes B to C and D to E, with susceptibility to liquefaction ranging from very low to moderate and high.
- **Geohazard – Landslide:** Snohomish County modeled landslide area upslope of study area.
- **Geohazard – Erosion:** Erosion hazard area present upslope of the study area.
- **Geohazard – Channel Migration Zone:** The Project is entirely within the Channel Migration Zone of the Sultan River.
- **Geohazard – Mine:** The southern extent of the study area is located adjacent to the Sultan River Placer – Gold Mine Hazard Area.
- **Geohazard – Steep Slopes:** Present upslope of study area.

Field Assessment Results

Herrera biologists Liliana Hansen, PWS and Danielle Rapoza, PWS conducted wetland and OHWM delineation field activities on January 27, 2026. Weather conditions during the fieldwork were fair with a daytime high temperature of 55 degrees Fahrenheit (°F). The field dates were determined to be within the growing season (as defined in Appendix A) due to the above ground vascular plant growth observed.

Wetlands

Herrera biologists examined the entire study area for wetlands. Herrera identified two wetlands associated with the Sultan River. Both wetlands were flagged and located in the field with a GPS receiver, except for the eastern-most boundaries of the wetlands, which were underwater at the time of the site visit. Eastern wetland boundaries were estimated in GIS.

Wetlands A and B, as well as five sample plots (SP-1 through SP-5), are shown in Figure 5. Wetland determination forms are provided in Appendix B. Table 3 includes a summary of the delineated wetlands and buffer widths.

Table 3. Summary of Wetlands Delineated in the Study Area.

Wetland Name	Approximate Area (sq. ft.)^a	USFWS Class^b	HGM Class^c	Wetland Category/Habitat Score (2014)^d	Snohomish County Buffer Width (feet)^e
A	1,310	PEM	Riverine	III / 7	75
B	1,275	PEM	Riverine	III / 7	75

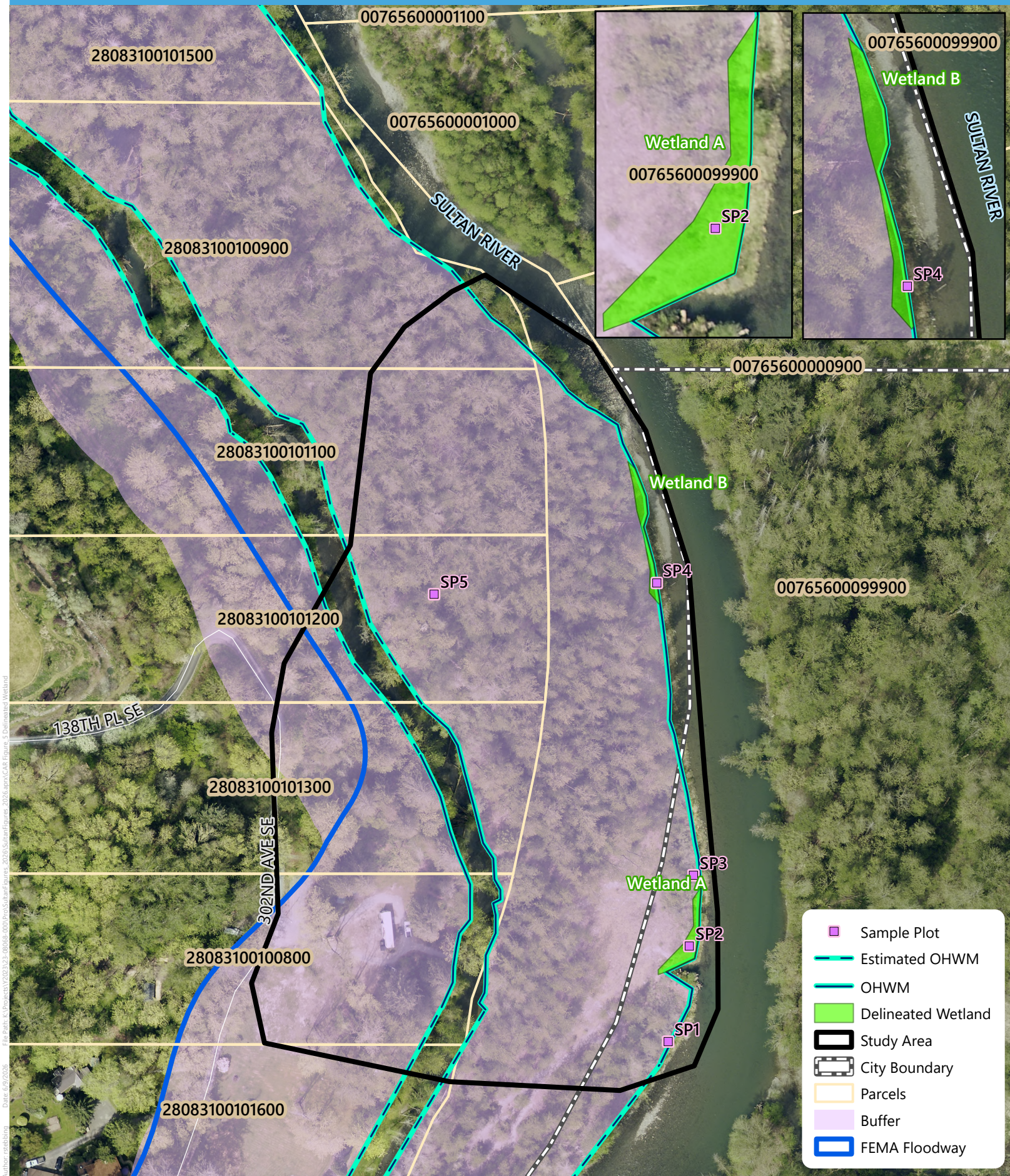
^a Approximate areas include wetland area that are below the OHWM and are therefore estimated.

^b U.S. Fish and Wildlife Service classification is based on FGDC (2013): palustrine forested (PFO), palustrine scrub-shrub (PSS), palustrine emergent (PEM), and palustrine aquatic bed (PAB).

^c HGM Class refers to the hydrogeomorphic classification is based on FGDC (2013).

^d Wetland Category and habitat score is based on the 2014 Washington State Department of Ecology (Ecology) wetland rating system (Hruby and Yahnke 2023).

^e Wetland buffer widths are based on the wetland rating, habitat score, and land use intensity and per SCC 60.62A.320. The Project would be classified as “low intensity land use”.



-  Sample Plot
-  Estimated OHWM
-  OHWM
-  Delineated Wetland
-  Study Area
-  City Boundary
-  Parcels
-  Buffer
-  FEMA Floodway

Wetlands A and B have a riverine hydrogeomorphic class, with their primary hydrology source being the main stem of the Sultan River. Both wetlands are dominated by palustrine emergent vegetation. Both wetlands also have a small amount of palustrine scrub-shrub vegetation; however, this was determined to be a minor component (i.e., <10 percent cover) and not incorporated in the wetland ratings. Dominant species include reed canarygrass (*Phalaris arundinacea*), small-fruited bulrush (*Scripus microcarpus*), soft rush (*Juncus effusus*), and slough sedge (*Carex obnupta*).

Soils at Wetland A (SP2) and Wetland B (SP4) exhibited hydric conditions and were saturated to the ground surface at the time of sampling. At Wetland A (SP2), the upper 2 inches of the soil profile consisted of a recent flood deposit from December 2025. From approximately 2 to 6 inches below ground surface, soils exhibited prominent redox concentrations meeting the Sandy Redox hydric soil indicator, which was also observed at Wetland B (SP4). A cobble layer was encountered below approximately 6 inches at Wetland A. In Wetland B, soils were observed to a depth of 16 inches, with sandy loam underlying the diagnostic layer.



Representative photos of Wetland A (top row), Wetland B (bottom row).

Wetland buffer widths in SCC are based on the wetland category and habitat score, and the intensity of the land use (SCC 30.62A.320). Both wetlands are Category III with a moderate habitat score (7 points). The proposed project is compatible with the low-intensity land use of the surrounding properties. Based on this information, the regulatory buffer widths for Wetlands A and B are 75 feet.

Wetland Buffers

Vegetation in the wetland buffers are dominated by scrub-shrub species, including red alder saplings (*Alnus rubra*), salmonberry (*Rubus spectabilis*), Pacific ninebark (*Physocarpus capitatus*), red-osier dogwood (*Cornus sericea*), native willows (*Salix spp.*), and Himalayan blackberry (*Rubus armenicus*). In addition, portions of the wetland buffers have minimal vegetation. This includes existing dirt/grass paths and a regularly flooded area, which is a partially vegetated gravel bar. The minimal vegetation in these areas includes moss and grasses, and small patches of scotch broom (*Cytisus scoparius*), Himalayan blackberry, butterfly bush (*Buddleja davidii*), and red alder saplings. Based on review of historical aerial imagery (Google Earth Pro 2026), this area was an unvegetated or minimally vegetated gravel bar since at least 1989, but has subsequently partially filled in with mainly invasive species over time.



Representative photos of wetland buffer vegetation over the partially vegetated gravel bar (left) and over existing paths (right).

Wetland Ratings

While Wetlands A and B are situated within the planning area for a new Skykomish River Temperature TMDL, both wetlands provide relatively low water quality functions due to the one vegetation class, lack of depressions, and lack of inputs from municipal areas. Both wetlands provide moderate hydrologic functions due to the vegetation structure that can slow flood velocities, and because they are located in a sub-basin known for flood damage. Wetlands A and B provide relatively high habitat functions due to the availability of multiple hydroperiods, habitat for listed fish populations, and large area of relatively undisturbed accessible habitat in the surrounding area.

Table 4 provides a summary of the function scores, the total wetland score, and the associated rating (category) for each delineated wetland based on the Ecology 2014 rating system (Hruby and Yahnke 2023).

Table 4. Individual Wetland Function Scores for Wetlands in the Study Area.											
Wetland Name	Water Quality Functions Rating ^a			Hydrologic Functions Rating ^a			Habitat Functions Rating ^a			Total Score ^b	Ecology Rating Category
	Site Potential	Landscape Potential	Value	Site Potential	Landscape Potential	Value	Site Potential	Landscape Potential	Value		
A	L	L	H	L	M	H	L	H	H	18	III
B	L	L	H	L	M	H	L	H	H	18	III

^a Qualitative ratings of H (high), M (moderate), and L (low) are based on the Washington State Department of Ecology (Ecology) rating system (Hruby and Yahnke 2023).

^b Total score is derived by adding all qualitative ratings together. Low ratings are worth 1 point, Moderate ratings are worth 2 points, and High ratings are worth 3 points.

Sultan River and Side Channel 2

Herrera delineated the west OHWM (right bank) of the Sultan River and both the east and west OHWMs of Side Channel 2 within the study area (Figure 4; Table 5).

Both watercourses have perennial flow and are shorelines of the State subject to Snohomish County's Shoreline Management Program. Per SCC 30.62A.320, Type S streams are subject to a 150-foot buffer width. However, when located within a Special Flood Hazard Area, the buffer extends to the channel migration zone plus 50 feet or the mapped floodway, whichever is greatest (SCC 30.62A.320(1)(a)). The entire project area is located within this required buffer. Indicators used to define the OHWM of Side Channel 2 during the field visit included a scour line indicated by clean gravel and lack of leaf litter, a topographic bench, and the lack of perennial vegetation. The December 2025 flood (a 2- to 5-year flood) left debris and sediment deposits at elevations above the typical 2-year flood level, making these indicators unreliable at the time of the site visit.

Table 5. Streams Delineated in the Study Area. ^a		
Water	Classification	Snohomish County Buffer Width (feet)
Sultan River	Type S	150
Side Channel 2	Type S	150

^a Classification and buffers are specified by SCC 30.62A.230 and 30.62A.320.

Stream Buffers

In addition to the vegetation dominant in wetlands and wetland buffers, as described previously, the riparian buffer consists primarily of deciduous forest with some young conifers. Dominant species include bigleaf maple (*Acer macrophyllum*), black cottonwood (*Populus balsamifera*), red alder, vine maple (*A. circinatum*), salmonberry, salal (*Gaultheria shallon*), and western sword fern (*Polystichum munitum*). At the time of the site visit, coniferous forest was dominant west of the Side Channel 2 and consisted primarily of western redcedar (*Thuja plicata*), Douglas fir (*Pseudotsuga menziesii*), salmonberry, salal, low Oregon grape (*Berberis nervosa*) and western sword fern. In addition, some riparian areas have been altered by low intensity rural development (e.g., paths and recreational use).



Representative photos (left and right) of riparian forest vegetation between the Sultan River and Side Channel 2.



Representative photo of riparian buffer east (left) and west (right) of Side Channel 2.

Fish and Wildlife Habitat Conservation Areas

During the site visit, Herrera biologists documented several relatively common winter resident forest bird species in the surrounding forest and migratory waterfowl around the water. None of the observed bird species are identified by WDFW as priority species. Herrera biologists observed recent evidence of beaver activity.

Substrate observed in the Sultan River was primarily large cobbles. Smaller cobbles to gravels, suitable for spawning of large-bodied salmonids, may be present in the river but were not observed in the study area due to high water and turbidity. However, as described in the desktop review portion of this report, this area is documented as spawning habitat for several salmonid species. Near the northern extent of the study area, shallow water flows through exposed cobbles, and likely provides velocity refugia and rearing habitat for juvenile salmonids. Minimal naturally recruited wood was observed. Undercut banks were observed on the left bank, opposite the study area. The healthy forested riparian habitat provides shading and organic matter inputs that support stream ecological functions.



Deep water provides habitat for adult and juvenile salmon in the Sultan River looking downstream towards Osprey Park (left). Shallow water edge habitat provides rearing habitat for juvenile salmonids in the Sultan River, in the northern extent of the study area (right).

Substrate in Side Channel 2 was dominated by coarse to very coarse gravel with minimal embeddedness, optimal for small and large bodied salmonids including Chinook, chum, coho, pink, steelhead, and cutthroat spawning. Undercut banks provide holding refugia for adult and juvenile fish. Large woody debris accumulation has added to channel complexity. The dense canopy provides thermal refugia of the channel. Herrera biologists observed an adult female coho salmon that appeared lethargic, indicating it had recently spawned nearby.



Undercut banks (left), and large woody debris (right) in Side Channel 2.



Salmonid spawning gravel (left), and a live, post-spawn adult female coho salmon observed in Side Channel 2 during the January site visit (right).

Snohomish County Code Requirements

Any development activity, project permit-required action, or clearing within wetlands, fish and wildlife habitat conservation areas, and their buffers is prohibited unless no net loss of critical area functions and values can be achieved, and complies with mitigation sequencing to avoid, minimize, and mitigate (SCC 30.62A.310). Functions and values are required to be replaced at a one-to-one ratio. Mitigation monitoring is required for a minimum of 3 years. Temporary impacts (i.e., those that can be restored to a pre-disturbance condition in a single growing season), must be compensated for at a one-to-one ratio (SCC 30.62A.320(3)(d) and 30.62A.340(4)(d)).

Shoreline habitat restoration or enhancement is permitted within rural conservancy and aquatic shoreline designations (SCC 30.67.430) and is subject to requirements in SCC 30.67.580 and must not adversely impact river currents, sediment processes, littoral drift, wetland, or fish and wildlife habitat conservation areas (SCC 30.580(1)(b)). Per SCC 30.67.580(1)(b) and 30.67.580(1)(g), stream enhancement and restoration **must not**:

- *Extend water-ward more than the minimum amount necessary to achieve the desired stabilization;*
- *Result in steep contours that impede easy pedestrian passage or trap drifting sediments;*
- *Be used solely to create new land area;*
- *Disturb riparian vegetation or shallow water fish and wildlife habitat, unless such habitat is replaced within the earliest appropriate season by new habitat or native vegetation consistent with subsection (1)(h) of this section;*
- *Result in a beach differing in character from natural conditions historically found on the site or vicinity; or*
- *Interfere with the normal public use of the navigable Waters of the State;*
- *Create barriers for juvenile or adult migrating fish;*
- *Remove large woody material embedded in a bank or bed except in those unique circumstances where removal is necessary to successfully achieve implementation of the restoration or enhancement project;*
- *Alter the natural stream more than the minimum amount necessary to achieve the desired restoration or enhancement; or*
- *Create a hazard to navigation, public infrastructure, or primary structures.*

Per SCC 30.67.580(1)(f) and 30.67.580(1)(h), stream restoration **must** be consistent with the following:

- *Large woody debris placement, engineered log jams, bioengineering techniques, fish screens, self-regulating tide gates, removal of artificial structures and fish barriers, fishways, and stream channel improvements shall be included where appropriate;*
- *Only short-term mechanical assistance may be used to accomplish planting;*
- *Plantings must be maintained to achieve at least an 80 percent survival rate after two years of placement;*
- *Size and composition of new materials added to a stream shall be as similar as possible to the existing natural materials, but large enough to withstand normal current, wake or wave action at the site; and*
- *Restoration or enhancement of the natural stream channel characteristics of length, width, gradient and sinuosity shall be included where appropriate.*
- *Replace disturbed vegetation with comparable plant species and diversity; or*
- *Improve riparian ecological functions by increasing plant diversity and including plant species offering higher habitat values, better bank stabilization, improved water quality functions or nutrient exchange.*

Project Description

The proposed project involves installing two ELJs along the right bank (west side) of the Sultan River in Snohomish County, Washington. This work represents the PUD's ongoing mitigation as a component of the Federal Energy Regulatory Commission license (Project No. 2157) for the Henry M. Jackson Hydroelectric Project and is intended to improve instream habitat for salmon in the Sultan River watershed. The southern ELJ (9) will consist of improving and expanding a previously constructed ELJ (7) at the south end of the study area while the northern ELJ (10) will be entirely new.

Project construction and staging will utilize existing roads/paths and minimally vegetated gravel bars to the extent practicable to minimize impacts to riparian vegetation and other natural resources. No permanent wetland, stream or buffer impacts are proposed.

Prior to clearing and grading activities, temporary high-visibility fencing will be installed along the disturbance limits (approximately 38,840 square feet) to prevent unintended encroachment by construction activities into areas not planned for impacts. Materials will be temporarily stockpiled on site within the construction staging area at the south end, over an existing gravel bar with minimal vegetation (consisting predominantly of invasive species and moss/grass).

Establishing a construction access route and staging area will require widening an existing 10-foot-wide dirt/grass path by approximately 4 feet to accommodate equipment access to ELJ 10, incurring approximately 13,500 square feet of disturbance to vegetation including up to 40 trees, which will be removed with a chainsaw. An additional 13,770-square-foot area of primarily low-quality invasive vegetation over a gravel bar will also be cleared for the staging area.

A temporary bridge will be placed over Side Channel 2 for construction access. This temporary bridge will be designed by the contractor and will span the wetted width (at a minimum) with a central pier (likely two ecology blocks) that will be placed near the center of the streambed. Due to the width of the existing wetted channel (approximately 80 feet across the OHWM at the access location) and because site access is constrained by a steep driveway with a tight switchback, installation of a single, 80-foot-wide bridge may not be feasible. Common bridge types on similar projects have included road plates and recycled rail cars, which may be utilized for this project. Before placing the ecology blocks in the streambed, block nets will be placed and fish will be removed from between them using agency-approved methods (described below).

Prior to beginning in-water work on the ELJs, sand and bulk bags will be delivered to the site and filled with imported or native alluvium excavated from above water levels. Bulk bags represent a temporary fill in the floodplain of approximately 226 cubic yards. An excavator will systematically place the bulk bags in an arc from the upstream bank to the downstream bank to create a coffer dam to isolate the in-water

work area. Once the coffer dams are completed, fish will be removed behind them using agency-approved methods.

Excavators will be used to regrade the shoreline. Excess soil will be transported off site via dump trucks. Construction of both ELJs will result in a net cut of approximately 995 cubic yards of material below the OHWM, and a net cut of 34 cubic yards in the riparian buffer (floodplain). An excavator or backhoe with a grapple will be used to move trees and logs. ELJs, consisting of logs, rootwads, and boulders will be installed along the regraded shoreline (see plans for quantities and dimensions). Cleared trees will be incorporated into the ELJs as slash and racking or will remain on site as woody debris. Chain will be used for lashing logs to boulders and other logs. ELJs will be backfilled with native alluvium and cobble and capped with topsoil to integrate the structures with the adjacent floodplain and support revegetation.

After construction is complete, grades will be restored to baseline conditions. The temporary access bridge will be removed and banks will be restored. All temporarily disturbed areas will be restored with native vegetation or hydroseeded to a pre-disturbance condition. See Appendix E for 60% Site Plans.

Summary of Impacts

There are no permanent stream or wetland impacts associated with the Project. A small amount of permanent impact will occur from converting stream buffer to river channel. Impacts have been categorized based on location (wetland, stream, or buffer) and the existing condition of the resource. Impact areas are shown in the plans (Appendix E) and summarized in Table 6.

Table 6. Impacts Identified for the Project.

Location	Description	Temporary or Permanent Impact	Area (sq. ft.)
Side Channel 2	Temporary bridge pier in streambed for equipment access.	Temporary	30
Sultan River	Disturbance below the OHWM from bulk bags.	Temporary	10,150
Wetland A	Vegetation clearing for access during installation of ELJ 9.	Temporary	190
Native riparian buffer	Clearing of native shrubs and saplings for construction access.	Temporary	13,500
Staging area in buffer	Construction disturbance to gravel bar with minimal vegetation consisting of Himalayan blackberry, Scotch broom, grasses, and moss.	Temporary	13,770
Buffer conversion to river	Conversion of riparian buffer to river at ELJ 10	Permanent	1,200
Total			38,840

See the Wetland Buffers and Stream Buffers sections above for a description of conditions in Wetland A, the Sultan River, and the riparian buffer. Impacts and subsequent planting areas in the riparian buffer are segregated into two categories based on the existing condition of the area:

- Native shrub buffer area consists of native shrubs and sapling species, including Pacific ninebark, red-osier dogwood, red alder, and native willows. Reed canarygrass and Himalayan blackberry are present but not dominant in these areas. In general, sandy, silty substrate underlain by cobble is present. These impact areas are currently providing moderate habitat functions.
- The existing gravel bar over the staging area consists primarily of invasive species and including Himalayan blackberry, butterfly bush, reed canarygrass, scotch broom, moss, and naturalized forbs and grass species. Substrate is generally compacted cobble with minimal topsoil.

Trees will be avoided as much as practicable during construction. However, up to 40 relatively small trees may be removed:

- 13 conifers (Sitka spruce, Douglas fir, and western redcedar), ranging between 4 and 13 inches diameter breast height (dbh).
- 27 deciduous trees (red alder and black cottonwood) ranging between 4 and 20 inches dbh, with one larger cottonwood at 38 inches dbh.

At the ELJ 10 location, the Project will result in conversion of 1,200 square feet of riparian buffer to river area for a scour pool. Following installation, topsoil will be placed atop the ELJ. However, due to flashy, high-flow conditions, and dry summer periods, long-term vegetation establishment is not expected on top of the ELJ. Accordingly, this area is considered a functional loss of buffer (conversion to in-stream habitat) and will be compensated through buffer and wetland enhancement in an alternate location (described in the next section).

Mitigation

The proposed project is a fish habitat restoration project that will result in long-term benefits to salmonids and floodplain habitat. However, temporary impacts to critical areas and their buffers are necessary to complete the Project. Additionally, a small area of permanent buffer impact will occur from converting riparian buffer to in-stream habitat. Buffer impacts will be mitigated through a sequence of actions intended to maintain or improve ecological functions currently present at the site. The Project follows the requirements for mitigation sequencing as outlined in SEPA (Washington Administrative Code [WAC] Chapter 197-11-768) and requirements in SCC 30.62A.150 and 30.62.A.310. The Project has made all reasonable efforts to avoid, minimize, rectify, reduce, and compensate for impacts on critical areas and buffers in a manner that maintains ecological functions of wetlands, streams, and buffers.

Goals and Objectives

The overall project goal is to improve year-round salmonid habitat within the Sultan River watershed and restore natural processes lost due to the presence of the dam. The objective of mitigation of temporary and permanent impacts at this site is to maintain and/or improve the habitat functions in the riparian buffer to achieve no net loss of ecological functions and values in accordance with SCC 30.62A.150.

Avoidance and Minimization

The Project will be constructed during the approved fish window (August 1 to 31) when fish are least likely to be present. Construction best management practices (BMPs) will be implemented to prevent impacts to species in the area, including the following:

- The construction footprint has been minimized by avoiding trees and new vegetation clearing to the maximum extent practicable by utilizing existing cleared/minimally vegetated areas for staging and access.
- The construction area limits will be marked with high-visibility silt fencing, to avoid inadvertent clearing, grading, and soil compaction, and at the critical root zones of large trees to be retained.
- All work waterward of the OHWM will occur over a period of 4 weeks during the dry season. All work will occur during the approved in-water-work window. Bulk bags will be temporarily placed in the river channel to isolate the in-water work area during construction and removed as soon as the work for the ELJs is completed.
- Temporary Erosion and Sediment Control (TESC) best management practices will be implemented per the Department of Ecology's Stormwater Management Manual for Western Washington, to minimize any impacts from turbid runoff. Soils will remain undisturbed to the maximum extent possible.
- A Spill Prevention, Control and Countermeasures (SPCC) will be incorporated into prevent impacts to aquatic species.

Mitigation Plan

All temporary impacts will be restored in place and in-kind at a one-to-one (impact-to-area) ratio. All permanent buffer impacts will be mitigated with enhancement at a one-to-one ratio, as shown in the plans (Appendix E), in accordance with SCC 30.62A.320(3)(d). In addition, functions and values will also be replaced at a one-to-one ratio (SCC 30.62A.310(3)(b)). SCC 30.62A.320(3)(d) specifies that *temporary impacts are those that can be restored to pre-disturbance conditions in one growing season.* Proposed mitigation areas are described in Table 7.

Table 7. Mitigation Areas Associated with the Project.

Location	Description	Area (sq. ft.)
Side Channel 2	Restore native substrate and bank conditions after temporary bridge removal.	30
Sultan River	Impacts are self-mitigating through beneficial installation of ELJs. Temporary water quality impacts will be managed through BMPs (discussed below).	10,150
Wetland A	Plant native emergent species and shrubs in the temporarily disturbed portion of Wetland A (190 sq. ft.), and remaining 1,120 sq. ft. of the wetland to compensate for functional loss of riparian buffer at ELJ 10.	1,310
Native riparian buffer	Plant native shrubs and trees in the temporarily disturbed portion (14,690 sq. ft.) as well as an additional 80 square feet of the riparian buffer to compensate for functional loss of riparian buffer at ELJ 10.	13,580
Staging area in buffer	Remove invasive vegetation and hydroseed to prevent erosion.	13,770
Total		38,840

After construction is complete, pre-project ground surface elevations and wetland hydroperiod will be restored in accordance the U.S. Army Corps of Engineers and Washington Department of Ecology joint guidance (Ecology, USACE, and EPA 2021).

To ensure plant establishment over one growing season, several measures have been incorporated into the mitigation plan which includes planting at a higher-than-normal density to account for plant mortality after installation and conducting routine maintenance.

Because the site is in a regulatory floodway, planting focused on native woody species. These plants improve floodplain function by resisting flood flows, slowing river velocity, and promoting sediment deposition.

Site Preparation and Planting Plan

Prior to planting, all invasive vegetation remaining in planting areas will be cleared and grubbed. All native vegetation remaining in planting areas will be protected as much as practicable. For all plantings, a planting hole will be dug to at least 1.5 times the size of the root ball to de-compact the soil, which will provide suitable conditions for root establishment.

Prior to planting and after invasive species removal, wood chips will be sheet mulched over planting areas (excluding wetland and seeding areas) to a 3-inch depth, to retain soil moisture and minimize colonization of nonnative vegetation that could interfere with plant establishment. Plants will then be installed through the mulch. Mulch shall be kept 3 inches from stems to prevent stem rot.

Plant species and spacing requirements to restore temporarily impacted areas are provided in Table 8. A minimum of 40 trees will be planted in the riparian buffer. Final plant quantities will be provided to the contractor in the 100% design plans. A hydroseed mix will be applied to the staging area (Table 9). If nursery stock is unavailable, a qualified biologist or landscape architect will approve all substitutions. All plantings will be native species appropriate to the climate and ecoregion in accordance with SCC 30.62A.310(3)(b).

Table 8. Plant Species, Size, and Spacing for Wetland and Riparian Buffer.

Wetland – 1,310 sq. ft.		
Species	Size	On-Center Spacing
Red-osier dogwood (<i>Cornus sericea</i>) ^a	4-foot live stake	2 feet
Sitka willow (<i>Salix sitchensis</i>)	4-foot live stake	2 feet
Slough sedge (<i>Carex obnupta</i>)	9-inch plug	1 foot
Riparian Buffer – 13,580 sq. ft.		
Species	Size	On-Center Spacing
Sitka spruce (<i>Picea sitchensis</i>)	2-gallon pot	15 feet
Western redcedar (<i>Thuja plicata</i>)	2-gallon pot	15 feet
Black cottonwood (<i>Populus balsamifera</i>)	2-gallon pot	15 feet
Big-leaf maple (<i>Acer macrophyllum</i>)	2-gallon pot	15 feet
Red alder (<i>Alnus rubra</i>)	2-gallon pot	15 feet
Vine maple (<i>Acer circinatum</i>)	1-gallon pot	15 feet
Ocean spray (<i>Holodiscus discolor</i>)	1-gallon pot	6 feet
Osoberry (<i>Oemleria cerasiformis</i>)	1-gallon pot	6 feet
Salmonberry (<i>Rubus spectabilis</i>)	18- to 36-inch bare root stock ^b	6 feet
Nootka rose (<i>Rosa nutkana</i>)	18- to 36-inch bare root stock ^b	6 feet
Common snowberry (<i>Symphoricarpos albus</i>)	18- to 36-inch bare root stock ^b	6 feet
Thimbleberry (<i>Rubus parviflorus</i>)	18- to 36-inch bare root stock ^b	6 feet

^a Red-osier dogwood stakes may be substituted with 1-gallon container plants at 6-foot on-center spacing.

^b Bare root stock may be substituted with 1-gallon container plants at 6-foot on-center spacing.

Table 9. Hydroseeding Mix for Staging Area in Buffer (13,770 square feet).

Species	Pure Live Seed (%)
Yarrow (<i>Achillea millefolium</i>)	20
Spike bentgrass (<i>Agrostis exarata</i>)	15
California brome (<i>Bromus carinatus</i>)	10
Tufted hairgrass (<i>Deschampsia caespitosa</i>)	5
Blue wildrye (<i>Elymus glaucus</i>)	15
Native red fescue (<i>Festuca rubra</i> var. <i>rubra</i>)	15
Meadow barley (<i>Hordeum brachyantherum</i>)	15
Sterile Poco barley (<i>Hordeum vulgare</i> var. <i>Poco</i>)	5

Schedule

Construction is anticipated to be completed in summer 2027. Mitigation plantings will likely be installed in the fall of 2027.

After construction and plant installation is completed, the as-built site plan and report will be prepared to document the baseline environmental site conditions. Subsequent monitoring reporting over a 3-year period will be based on the performance standards and site goals. A 5-year monitoring period is typically required for mitigation of impacts to critical areas and buffers in Snohomish County (SCC 30.62A.310(3)(b)). However, since these impacts are largely temporary and stem from a beneficial restoration project that was part of the relicensing restoration plan, which was accepted by the County more than 15 years ago, a 3-year monitoring period is proposed to match the expected requirements set by the USACE and WDFW. Should the mitigation site fail to meet a performance standard in a given year, additional years of monitoring and maintenance may be required to ensure establishment of the mitigation goals.

As-built documentation and the annual monitoring schedule are indicated in Table 10. Should contingency measures need to be recommended due to poor plant performance, then additional planting may be recommended.

Table 10. Anticipated Schedule.

2027	2028	2029	2030
Construction completion, planting, and as-built reporting (Fall/Winter)	Year 1 Monitoring (Summer)	Year 2 Monitoring (Summer)	Year 3 Monitoring (Summer), permit close-out

Performance Standards

Vegetation performance standards are provided in Table 11. All plantings will be maintained to achieve at least an 80 percent survival rate after two years of placement in accordance with the SMP (SCC 30.67.580(1)(f)). In the mitigation areas, all planted trees and shrubs will be counted and assessed

for percent survival and cover of invasive species in Years 1, 2, and 3. Beginning in monitoring Year 1, annual monitoring plots and photo points will be established to track species cover over time.

Percent cover of all Class A, B and C weeds required for control by the Snohomish County Noxious Weed List will be documented. Himalayan blackberry, butterfly bush, scotch broom, and reed canarygrass will be monitored in all required monitoring years and will have a combined total of less than 15 percent cover. The Snohomish County Noxious Weed List is updated annually in the spring and is based on the Washington State noxious weed list (WAC 16-750).

Table 11. Native and Invasive Vegetation Performance Standards for the Project.

Performance Standard #	Performance Standard Description	Year 1	Year 2	Year 3
1.1	Percent survival of planted shrubs and trees in all planting areas.	≥80	≥80	NA
1.2	Percent cover of emergent plugs in wetland.	NA	≥15	≥20
2.1	Percent cover of Class A, B, and C weeds required for control in Snohomish County, in all planting areas.	0	0	0
2.2	Percent cover of Himalayan blackberry, butterfly bush, scotch broom, and reed canarygrass, in all planting areas.	<15	<15	<15

Monitoring and Reporting

The purpose of the monitoring is to ensure that the ELJs are functioning properly without degradation of adjacent aquatic areas and to assess if planting areas are meeting performance criteria. Vegetation will be assessed for survival and cover criteria.

After construction and planting are completed (estimated to occur in the fall of 2027), an as-built site plan and report will be prepared to document the environmental site conditions. The as-built report will also include documentation of any approved changes to the mitigation plan; changes will also be documented on an as-built plan sheet. This as-built will be used as a baseline for annual monitoring and submitted to the permitting agencies for review and approval.

Year 1 monitoring will start in the first growing season after planting is complete. A qualified biologist shall conduct annual monitoring site visits to evaluate plant establishment beginning at the end of the first full growing season (late summer/early fall). Monitoring will include evaluating plant mortality, documenting cover of invasive species, recommendations for plant replacements, and recommendations for additional maintenance to ensure plant establishment. Photographs will be taken of the mitigation planting areas.

Upon completion of each annual monitoring site visit, the monitoring biologist will prepare a monitoring report that documents successes, problems, and contingency actions for the mitigation project. The report will include photos and approximate locations of invasive plants that need to be removed or controlled. The report will be submitted to the agencies before the end of each monitoring calendar year.

Maintenance

To ensure successful plant establishment, the PUD will coordinate necessary maintenance of all planted vegetation at least 2 times per year (spring and summer) after acceptance of initial planting. Plant establishment maintenance will include but is not limited to the following:

- Removing and controlling invasive vegetation
- Replacing plants or re-planting with substitutions

If success criteria for percent coverage of native plants and invasive, nonnative species have not been satisfied, maintenance activities may include, but are not limited to, plant replacement, plant substitution, adjustment of the planting layout to reflect specific or changing site conditions, weed control, installation and adjustment of plant protection devices, or other restoration methods approved by permit agencies.

Should monitoring of the site indicate that the proposed mitigation measures are not meeting performance standards, a qualified biologist or ecologist shall prepare a contingency plan to address deficiencies and recommend adaptive measures for project success.

Performance Security

A performance security must be provided to make sure that all mitigation required by SCC 30.62A is completed and functions according to the approved plans, specifications, permits, or any approval conditions. SCC 30.84.140 requires:

- (1) Prior to issuance of any permit or approval which authorizes site disturbance which requires mitigation pursuant to chapter 30.62A SCC, the director shall require a performance security to assure that all mitigation required by chapter 30.62A SCC is satisfactorily completed in accordance with the approved plans, specifications, permit or approval requirements, and applicable regulations, will be corrected to comply with approved plans, specifications, requirements.*
- (2) The performance security shall be released when all mitigation is completed to the satisfaction of the department, pursuant to the plans, specifications and permit conditions and the department has accepted a performance monitoring security.*
- (3) A performance monitoring security shall be provided for all installed mitigation after final inspection and acceptance by the department and prior to recordation of a subdivision or short subdivision, approval of occupancy of the first new single-family detached unit (SFDU), issuance of a certificate of occupancy for condominiums, or any type of commercial project or final of a single-family residence or duplex permit*

If required by Snohomish County, a cost estimate will be developed for mitigation and monitoring efforts to establish the performance security amount and submitted prior to permit issuance.

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Appendix A

Methods

Wetland Delineation Methods

The wetland delineation for the study area was performed in accordance with the *Regional Supplement to the U.S. Army Corps of Engineers Wetlands Delineation Manual: Western Mountains, Valleys, and Coast Region* (Environmental Laboratory 2010), which is consistent with the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987). These methods use a three-parameter approach for identifying and delineating wetlands: the presence of field indicators for hydrophytic vegetation, hydric soils, and hydrology. This wetland delineation was performed according to procedures specified for the routine wetland determination method (Environmental Laboratory 1987).

To identify potential wetlands, wetland biologists evaluated field conditions by traversing the study area and noting wetlands, streams, and other aquatic features. A sample plot was established for each area that appeared to have potential wetland characteristics. For each sample plot, data on dominant plant species, soil conditions in test plots, and evidence of hydrologic conditions were recorded on wetland determination data forms. Plants, soils, and hydrologic conditions were also analyzed and documented in adjacent uplands. Based on collected data, a determination of wetland or upland was made for each area examined.

Biologists hung flagging on vegetation to mark the horizontal location of the location of wetland boundaries and sample plots. Herrera located sample plots and wetland boundary points with an Eos Skadi 100 unit capable of sub-meter accuracy.

Hydrophytic Vegetation

Hydrophytic vegetation is characterized by the ability to grow, effectively compete, reproduce, and persist in anaerobic soil conditions resulting from periodic or long-term saturation (Environmental Laboratory 1987). Vegetation must meet at least one of the four indicators (described below) that are used to determine the presence of hydrophytic vegetation in wetlands. Problematic and atypical situations for hydrophytic vegetation are also described in the U.S. Army Corps of Engineers (USACE) delineation manual and supplement (Environmental Laboratory 1987, 2010).

Plant Species Identification

Plant species were identified using *Flora of the Pacific Northwest* (Hitchcock and Cronquist 1987) and *A Field Guide to the Common Wetland Plants of Western Washington and Northwestern Oregon* (Cooke 1997). The indicator status of each plant species is based on the *National Wetland Plant List* (Lichvar 2016) for the Western Mountains, Valleys, and Coast Region.

Dominant Species Determination

Dominant species are those that contribute more than other species to the character of a plant community. To determine dominance, a vegetation sampling area is determined by the field biologist to accurately characterize the plant community that occurs in the area to be evaluated. These are

commonly circular sampling areas, centered on the location of the test plot (where soil and hydrologic data is also collected). The radius of the circle is determined in the field, based on site conditions. In large wetlands, a typical sampling radius would be 2 to 5 meters for tree and sapling/shrub species, and 1 meter for herbaceous species. In a small or narrow wetland (or upland), the radius might be reduced to accurately sample wetland (upland) areas, thereby avoiding an overlap into an adjacent community having different vegetation, soils, or hydrologic conditions (Environmental Laboratory 2010).

Within the vegetation sampling area, a complete list of plant species that occur in the sampling area is compiled and the species divided into four strata: tree, shrub (including saplings, see criteria below), herb, and woody vines. A plant is included in the tree stratum if it is a woody plant 3 inches in diameter at breast height (dbh) or greater; in the shrub stratum if it is a woody plant less than 3 inches dbh (including tree saplings under 3 inches dbh); in the herb stratum if it is an herbaceous (non-woody) plant; and in the woody vine stratum if it is a woody vine of any height (Environmental Laboratory 2010). To be included in the sampling, 50 percent or more of the plant base must be within the radius of the sampling area. For trees specifically, more than 50 percent of the trunk (diameter) must be within the sampling radius to be included.

A rapid test, dominance test (e.g., the 50/20 rule), or prevalence index are commonly used to determine which species are considered dominant and to assess whether the criteria for hydrophytic vegetation are met at each test plot (Environmental Laboratory 2010). Additional hydrophytic vegetation indicators are discussed in the following section.

To conduct a rapid test (Indicator 1 on the wetland determination data form), the dominant species are evaluated visually and if all are FACW or OBL, the vegetation data passes the rapid test. To conduct a dominance test (Indicator 2 on the wetland determination data form), the absolute areal coverage of the plant species within a stratum are totaled, starting with the most abundant species and including other species in descending order of coverage, until the cumulative coverage exceeds 50 percent of the total coverage for the stratum. The plant species that constitute this first 50 percent of areal coverage are considered the dominant species in the stratum. In addition, any other any single plant species that constitutes at least 20 percent of the total percent cover in the stratum is also considered a dominant species (Environmental Laboratory 2010). The indicator status category for each plant (shown in Table A-1) is also listed on the wetland determination form. If more than 50 percent of the dominant species across all strata are rated OBL, FACW, or FAC, the hydrophytic vegetation dominance test (Indicator 2) is met.

The prevalence index (Indicator 3 on the wetland determination data form) is a weighted-average wetland indicator status of all plant species in the sampling plot, where weighting is by abundance (Environmental Laboratory 2010). This method is used where indicators of hydric soil and wetland hydrology are present, but the vegetation initially fails the rapid and dominance tests (Indicators 1 and 2). To determine the prevalence index, the absolute cover of each species in each stratum is determined. All species (across all strata) are organized into wetland indicator status groups (i.e., OBL, FACW, FAC, FACU, or UPL) and their cover values are summed within the groups. The formula for the prevalence index is applied. If the prevalence index (which ranges from 1.0 to 5.0) equals 3.0 or less, this hydrophytic vegetation indicator is met.

Table A-1. Plant Indicator Status Categories.

Indicator Status	Indicator Symbol	Definition
Obligate wetland plants	OBL	Plants that occur almost always (estimated probability >99%) in wetlands under natural conditions but also occur rarely (estimated probability <1%) in upland areas
Facultative wetland plants	FACW	Plants that usually occur (estimated probability >67%) in wetlands under natural conditions but also occur (estimated probability 1% to 33%) in upland areas
Facultative plants	FAC	Plants with a similar likelihood (estimated probability 33% to 67%) of occurring in both wetlands and upland areas
Facultative upland plants	FACU	Plants that sometimes occur (estimated probability 1% to 33%) in wetlands but occur more often (estimated probability >67% to 99%) in upland areas
Obligate upland plants	UPL	Plants that rarely occur (estimated probability <1%) in wetlands under natural conditions

$$WET \leftarrow \xrightarrow{OBL - FACW - FAC - FACU - UPL} DRY$$

Source: Environmental Laboratory (1987).

Additional Hydrophytic Vegetation Indicators

The presence of morphological adaptations to wetland conditions in plants that lack a published hydrophytic vegetation indicator status or with an indicator status of FACU or drier is also a hydrophytic vegetation indicator (Indicator 4). Evidence of physiological, morphological, or reproductive adaptations indicating growth in hydrophytic conditions can include, but are not limited to, buttressed roots, adventitious roots, multi-stemmed trunks, or tussocks. To determine whether Indicator 4 is met, the morphological features must be observed on more than 50 percent of the individuals of a FACU species (or species without a published indicator status) living in an area where hydric soil and wetland hydrology are present. On the wetland determination data form, the indicator status of the species with morphological adaptations would be changed to FAC (with supporting notes), and the dominance test (Indicator 2) and/or prevalence index (Indicator 3) would then be recalculated.

Wetland non-vascular plants, referred to as bryophytes and consisting of mosses, liverworts, and hornworts, may also meet the hydric vegetation criteria, under Indicator 5 (Environmental Laboratory 2010). These plants must be present in areas containing hydric soils and wetland hydrology. The percent cover of wetland specialist bryophytes is determined in 10-inch-by-10-inch square plots placed at the base of hummocks, if present. The summed cover of wetland specialist bryophytes must be more than 50 percent of the total bryophyte cover in the vegetation sampling area.

The problematic hydrophytic vegetation indicator section in the USACE regional supplement further explains how to interpret situations in which hydric soils and wetland hydrology are present but hydrophytic vegetation Indicators 1 through 5 are lacking (Environmental Laboratory 2010). Procedures for looking at settings such as areas with active vegetation management (e.g., farms), areas dominated by aggressive invasive species, active floodplains, and low terraces are described, as well as explanations

for specific situations, such as seasonal shifts in plant communities, extended drought conditions, and riparian areas.

Hydric Soils

A hydric soil is a soil that is saturated, flooded, or inundated long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation (Environmental Laboratory 1987, 2010). The evaluation of existing soil maps (developed by the U.S. Department of Agriculture [USDA] Natural Resources Conservation Service [NRCS] and other sources) is used to understand hydric soil distribution and to identify the likely locations of hydric soils (by verifying their inclusion on the hydric soils list). Comparison of these mapped soils to conditions found on site help verify the presence of hydric soils.

For onsite soils characterization, hydric soils data were obtained generally by digging test pits at least 20 inches deep and 4 inches wide. Hydric soil conditions were evaluated using indicators outlined in *Field Indicators of Hydric Soils in the United States* (NRCS 2017) and adopted by the *Regional Supplement to the U.S. Army Corps of Engineers Wetlands Delineation Manual: Western Mountains, Valleys, and Coast Region* (Environmental Laboratory 2010).

Hydric soil indicators applicable to the Western Mountains, Valleys, and Coast region include, but are not limited to, the presence of organic soils (i.e., histosols or histic epipedons); sulfidic material (i.e., hydrogen sulfide); depleted, gleyed, or reduced soil matrices; and/or the presence of iron or manganese concretions (Environmental Laboratory 2010). Soil color characterization (i.e., hue, value, and chroma) is a critical tool in determining depleted, gleyed, and reduced soil conditions. Soil color was evaluated by comparing soil colors at test plots to standardized color samples in *Munsell Soil Color Charts* (Munsell Color 2000).

Wetland Hydrology

Wetland hydrology is indicated by site conditions that demonstrate the periodic inundation or saturation to the soil surface for a sufficient duration during the total growing season. A *sufficient duration* during the growing season is defined as 14 or more consecutive days of flooding, ponding, or presence of a water table at 12 inches or less from the soil surface (Environmental Laboratory 2010). The growing season is the period of consecutive frost-free days, or the longest period during which the soil temperature stays above biological zero (41°F), when measured at 12 inches below the soil surface.

Two indicators of biological activity can be used to determine whether the growing season has begun and is ongoing (Environmental Laboratory 2010):

- Occurrence of aboveground growth and development of at least two non-evergreen vascular plant species growing within the wetland. Examples of this growth include the emergence or elongation of leaves on woody plants and the emergence or opening of flowers.
- Soil temperature, which can be measured once during a single site visit, should be at least 41°F or higher at a depth of 12 inches.

For this assessment, onsite hydrologic indicators were examined at the test plots. Hydrologic indicators may include the presence of surface water, standing water in the test pit at a depth of 12 inches or less, saturation in the root zone, watermarks, drift lines, sediment deposits, drainage patterns within wetlands, oxidized rhizospheres surrounding living roots, and water-stained leaves.

Antecedent Precipitation Analysis

Analyzing climatic conditions and local weather patterns are important in the assessment of vegetation, soil conditions, and hydrology for wetland delineations (Environmental Laboratory 1987, 2010), and information on precipitation that precedes a site visit is valuable in helping determine whether conditions observed at a site are reflective of normal rainfall. The NRCS (1997) provides methodology for the analysis of normal environmental conditions using antecedent rainfall measurements. For this method, “normal precipitation” is defined as ranges of normal precipitation or values falling within defined thresholds, in this case, the 30th and 70th percentile thresholds (Sprecher and Warne 2000). These ranges for a particular site are provided by WETS tables, which can be accessed through the NRCS National Water and Climate Center (NRCS 2018) and are calculated using long-term data (30 years) recorded at National Weather Service meteorological stations. USDA WETS tables display monthly average rainfall data (50th percentile) in addition to the upper and lower limits at which there is a 30 percent chance that rainfall will be more or less than the average (30th and 70th percentiles) (NRCS 2017). USDA WETS tables use climatological probabilities and are calculated on the basis of the most recent three decades of data, as factors such as climate change and different recording technologies may alter probabilities (Sprecher and Warne 2000). Currently, the 30-year range from 1981 to 2010 is used. This method makes the assumptions that rainfall is evenly distributed within a month, that antecedent precipitation can be properly evaluated for a 3-month period (i.e., assumes that evapotranspiration is the same in each season), that antecedent precipitation affects different systems similarly, and that snowmelt has the same contribution to hydrology as rainfall (Sprecher and Warne 2000).

To determine whether recent precipitation is reflective of normal precipitation, a representative weather station near the site is selected; as other conditions may affect precipitation (e.g., elevation, aspect, and proximity to mountains), the nearest station may not be the most representative of the site (Environmental Laboratory 2010). The procedure for determining normal precipitation uses measured rainfall data from the 3 months prior to the month of the site visit. For example, if the site visit occurs in September, precipitation data from June, July, and August would be analyzed. The recorded rainfall of each month is first compared to the long-term range of normal precipitation (30th and 70th percentiles) and is determined to have a “normal” condition if it falls within this range; if the recorded data is higher or lower than the range, then it is determined to have a “wet” or “dry” condition, respectively. The condition is then given a value, “1” for “dry,” “2” for “normal,” and “3” for “wet”; and this value is multiplied by the weighted monthly value, where the most recent month (1 month prior) is weighted heavier (3) than 3 months prior (1). The sum of this product is then used to determine whether the entire 3-month period is “drier than normal” (6–9), “normal” (10–14) or “wetter than normal” (15–18). While this method is useful for comparing a short-term time period to normal, this method is limited in that it discounts analysis of daily precipitation patterns within a given month (Sprecher and Warne 2000, Sumner et al. 2009).

The U.S. Army Corps of Engineers *Antecedent Precipitation Tool* was used for this analysis (USACE 2025).

Ordinary High Water Mark Delineation Methods

The ordinary high water mark (OHWM) of the Sultan River and Side Channel were delineated using the definition provided in the WAC, Section 222-16-010. According to this definition, the OHWM of streams is “that mark that will be found by examining the bed and banks and ascertaining where the presence and action of waters are so common and usual, and so long continued in all ordinary years, as to mark upon the soil a character distinct from that of the abutting upland, in respect to vegetation.” In addition, methods in the publication *Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State* (Anderson et al. 2016) were applied.

To delineate the OHWM, the bed and adjacent banks of streams in the study area were examined for indications of regular high water events. Factors considered when assessing changes in vegetation include:

- Scour (removal of vegetation and exposure of gravel, sand, or other soil substrate)
- Drainage patterns
- Elevation of floodplain benches
- Changes in sediment texture across the floodplain
- Sediment layering
- Sediment or vegetation deposition
- Changes in vegetation communities across the floodplain

Biologists hung flagging on vegetation to mark the horizontal location of the OHWM which was located directly beneath the flag. The locations of the OHWM flags were located by Herrera with an Eos Skadi 100 unit capable of sub-meter accuracy.

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Appendix B

Wetland Determination Forms

U.S. Army Corps of Engineers				OMB Control #: 0710-0024, Exp: 9/30/2027 Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)	
WETLAND DETERMINATION DATA SHEET – Western Mountains, Valleys, and Coast Region See ERDC/EL TR-10-3; the proponent agency is CECW-CO-R					
Project/Site: Sultan ELJ 9 & 10		City/County: Snohomish County		Sampling Date: 1/27/26	
Applicant/Owner: Snohomish County PUD No. 1		State: WA		Sampling Point: SP1	
Investigator(s): L. Hansen, D. Rapoza		Section, Township, Range: S31, T28N, R08E			
Landform (hillside, terrace, etc.): floodplain		Local relief (concave, convex, none): none		Slope (%): 2	
Subregion (LRR/MLRA): LRR A, MLRA 2		Lat: 47.87240°		Long: -121.82508° Datum: NAD 1983	
Soil Map Unit Name: Pilchuck loamy sand		NW1 classification: PFO1C			
Are climatic / hydrologic conditions on the site typical for this time of year? Yes <u>X</u> No <u> </u> (If no, explain in Remarks.)					
Are Vegetation <u> </u> , Soil <u> </u> , or Hydrology <u> </u> significantly disturbed? Are "Normal Circumstances" present? Yes <u> </u> No <u>X</u>					
Are Vegetation <u> </u> , Soil <u> </u> , or Hydrology <u> </u> 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 <u>X</u> No <u> </u>			Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>		
Hydric Soil Present? Yes <u> </u> No <u>X</u>					
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>					
Remarks: Upland south of WLA. Near mainstem of river across from Osprey Park. Located on floodplain bench ~15 feet from OHWM. Wracked debris on surface and in shrubs, evidence of December 2025 flooding. Vegetation and hydrology indicators present. No soil indicators.					
VEGETATION – Use scientific names of plants.					
Tree Stratum (Plot size: 3m)		Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A) Total Number of Dominant Species Across All Strata: 3 (B) Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)
1. <u> </u>					
2. <u> </u>					
3. <u> </u>					
4. <u> </u>					
			=Total Cover		
Sapling/Shrub Stratum (Plot size: 2m)					Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u> </u> x 1 = <u> </u> FACW species <u> </u> x 2 = <u> </u> FAC species <u> </u> x 3 = <u> </u> FACU species <u> </u> x 4 = <u> </u> UPL species <u> </u> x 5 = <u> </u> Column Totals: <u> </u> (A) <u> </u> (B) Prevalence Index = B/A = <u> </u>
1. <u>Alnus rubra</u>		15	Yes	FAC	
2. <u>Rubus armeniacus</u>		20	Yes	FAC	
3. <u>Rubus spectabilis</u>		40	Yes	FAC	
4. <u> </u>					
5. <u> </u>					
		75	=Total Cover		
Herb Stratum (Plot size: 1m)					Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% 3 - Prevalence Index is ≤3.0 ¹ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) 5 - Wetland Non-Vascular Plants ¹ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Tolmiea menziesii</u>		3	No	FAC	
2. <u>Carex obnupta</u>		1	No	OBL	
3. <u> </u>					
4. <u> </u>					
5. <u> </u>					
6. <u> </u>					
7. <u> </u>					
8. <u> </u>					
9. <u> </u>					
10. <u> </u>					
11. <u> </u>					
		4	=Total Cover		
Woody Vine Stratum (Plot size: 1m)					Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
1. <u> </u>					
2. <u> </u>					
			=Total Cover		
% Bare Ground in Herb Stratum 96					
Remarks: Dominance test indicator met.					

SOIL

Sampling Point: SP1

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		
0-7	2.5Y 3/2	100					Sandy	Sand
7-12	2.5Y 3/2	100					Loamy/Clayey	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.)			Indicators for Problematic Hydric Soils ³ :	
☐ Histosol (A1)	☐ Sandy Gleyed Matrix (S4)	☐ 2 cm Muck (A10) (LRR A, E)		
☐ Histic Epipedon (A2)	☐ Sandy Redox (S5)	☐ Iron-Manganese Masses (F12) (LRR D)		
☐ Black Histic (A3)	☐ Stripped Matrix (S6)	☐ Red Parent Material (F21)		
☐ Hydrogen Sulfide (A4)	☐ Loamy Mucky Mineral (F1) (except MLRA 1)	☐ Very Shallow Dark Surface (F22)		
☐ 1 cm Muck (A9) (LRR D, G)	☐ Loamy Gleyed Matrix (F2)	☐ Other (Explain in Remarks)		
☐ Depleted Below Dark Surface (A11)	☐ Depleted Matrix (F3)			
☐ Thick Dark Surface (A12)	☐ Redox Dark Surface (F6)			
☐ Iron Monosulfide (A18)	☐ Depleted Dark Surface (F7)			
☐ Sandy Mucky Mineral (S1)	☐ Redox Depressions (F8)			
☐ 2.5 cm Mucky Peat or Peat (S2) (LRR G)				

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

Restrictive Layer (if observed):		Hydric Soil Present?	
Type: _____		Yes	No
Depth (inches): _____		☒	☐

Remarks:
No soil indicators present. Could not dig below 12" b/c cobbly.

HYDROLOGY

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

Field Observations:				Wetland Hydrology Present?	
Surface Water Present?	Yes ☐	No ☒	Depth (inches): _____	Yes	No
Water Table Present?	Yes ☐	No ☒	Depth (inches): _____	☒	☐
Saturation Present?	Yes ☒	No ☐	Depth (inches): 0		
(includes capillary fringe)					

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

Remarks:
Sediment and drift deposits but most likely from December 2025 flooding.

U.S. Army Corps of Engineers WETLAND DETERMINATION DATA SHEET – Western Mountains, Valleys, and Coast Region See ERDC/EL TR-10-3; the proponent agency is CECW-CO-R		OMB Control #: 0710-0024, Exp: 9/30/2027 Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)																																																																																																																																																																																										
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Subregion (LRR/MLRA): <u>LRR A, MLRA 2</u> Lat: <u>47.87264°</u> Long: <u>-121.82501°</u> Datum: <u>NAD 1983</u>																																																																																																																																																																																												
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Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B) Prevalence Index worksheet: <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 60%;">Total % Cover of:</th> <th style="width: 40%;">Multiply by:</th> </tr> <tr><td>OBL species</td><td>x 1 =</td></tr> <tr><td>FACW species</td><td>x 2 =</td></tr> <tr><td>FAC species</td><td>x 3 =</td></tr> <tr><td>FACU species</td><td>x 4 =</td></tr> <tr><td>UPL species</td><td>x 5 =</td></tr> <tr><td>Column Totals:</td><td>(A) (B)</td></tr> <tr><td colspan="2">Prevalence Index = B/A =</td></tr> </table>			Total % Cover of:	Multiply by:	OBL species	x 1 =	FACW species	x 2 =	FAC species	x 3 =	FACU species	x 4 =	UPL species	x 5 =	Column Totals:	(A) (B)	Prevalence Index = B/A =																																																																																																																																																																											
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Hydrophytic Vegetation Indicators: <u> </u> 1 - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% <u> </u> 3 - Prevalence Index is ≤3.0¹ <u> </u> 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet) <u> </u> 5 - Wetland Non-Vascular Plants¹ <u> </u> Problematic Hydrophytic Vegetation¹ (Explain) ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>																																																																																																																																																																																												
Remarks: Bare ground is primarily open water. Dominance test and prevalence index indicators met.																																																																																																																																																																																												

SOIL

Sampling Point: SP2

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							Sandy	not colored, no redox
2-6	5Y 3/1	95	10YR 3/4	5	C	PL/M	Sandy	Prominent redox concentrations
6-7								cobble

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.)			Indicators for Problematic Hydric Soils ³ :	
☐ Histosol (A1)	☐ Sandy Gleyed Matrix (S4)	☐ 2 cm Muck (A10) (LRR A, E)		
☒ Histic Epipedon (A2)	☒ Sandy Redox (S5)	☐ Iron-Manganese Masses (F12) (LRR D)		
☐ Black Histic (A3)	☐ Stripped Matrix (S6)	☐ Red Parent Material (F21)		
☐ Hydrogen Sulfide (A4)	☐ Loamy Mucky Mineral (F1) (except MLRA 1)	☐ Very Shallow Dark Surface (F22)		
☐ 1 cm Muck (A9) (LRR D, G)	☐ Loamy Gleyed Matrix (F2)	☐ Other (Explain in Remarks)		
☐ Depleted Below Dark Surface (A11)	☐ Depleted Matrix (F3)			
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☐ Iron Monosulfide (A18)	☐ Depleted Dark Surface (F7)			
☐ Sandy Mucky Mineral (S1)	☐ Redox Depressions (F8)			
☐ 2.5 cm Mucky Peat or Peat (S2) (LRR G)				

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

Restrictive Layer (if observed):		Hydric Soil Present?	
Type: _____		Yes	☒ No ☐
Depth (inches): _____			

Remarks:
Top 2 inches is December 2025 flood deposit. Cobble layer below 6 inches, could not sample below this area". Sandy redox indicator met.

HYDROLOGY

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

Field Observations:				Wetland Hydrology Present?	
Surface Water Present?	Yes ☒ No ☐	Depth (inches):	<u>0.5</u>	Yes	☐ No ☒
Water Table Present?	Yes ☒ No ☐	Depth (inches):	<u>0</u>		
Saturation Present?	Yes ☒ No ☐	Depth (inches):	<u>0</u>		
(includes capillary fringe)					

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

Remarks:
Water table present at surface.

U.S. Army Corps of Engineers				OMB Control #: 0710-0024, Exp: 9/30/2027	
WETLAND DETERMINATION DATA SHEET – Western Mountains, Valleys, and Coast Region				Requirement Control Symbol EXEMPT:	
See ERDC/EL TR-10-3; the proponent agency is CECW-CO-R				(Authority: AR 335-15, paragraph 5-2a)	
Project/Site: Sultan ELJ 9 and 10		City/County: Snohomish County		Sampling Date: 1/27/26	
Applicant/Owner: Snohomish County PUD No. 1		State: WA		Sampling Point: SP3	
Investigator(s): L. Hansen, D. Rapoza		Section, Township, Range: S31, T28N, R08E			
Landform (hillside, terrace, etc.):		Local relief (concave, convex, none): none		Slope (%): 1	
Subregion (LRR/MLRA): LRR A, MLRA 2		Lat: 47.87274°		Long: -121.82498°	
Soil Map Unit Name: Pilchuck loamy sand		Datum: NAD 1983			
Soil Map Unit Name: Pilchuck loamy sand		NW1 classification: PFO1C			
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)					
Are Vegetation, Soil, or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No					
Are Vegetation, Soil, or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)					
SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.					
Hydrophytic Vegetation Present? Yes X No			Is the Sampled Area within a Wetland? Yes No X		
Hydric Soil Present? Yes No X					
Wetland Hydrology Present? Yes X No					
Remarks: Upland. Vegetation and hydrology indicators met. No soil indicator.					
VEGETATION – Use scientific names of plants.					
Tree Stratum (Plot size: 3m)		Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A) Total Number of Dominant Species Across All Strata: 3 (B) Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)
1.					
2.					
3.					
4.					
		=Total Cover			
Sapling/Shrub Stratum (Plot size: 2m)					Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species x 1 = FACW species x 2 = FAC species x 3 = FACU species x 4 = UPL species x 5 = Column Totals: (A) (B) Prevalence Index = B/A =
1. Rubus armeniacus		30	Yes	FAC	
2. Salix lasiandra		20	Yes	FACW	
3. Rubus spectabilis		5	No	FAC	
4.					
5.					
		55	=Total Cover		
Herb Stratum (Plot size: 1m)					Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation X 2 - Dominance Test is >50% 3 - Prevalence Index is ≤3.0 ¹ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) 5 - Wetland Non-Vascular Plants ¹ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. Phalaris arundinacea		10	Yes	FACW	
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
		10	=Total Cover		
Woody Vine Stratum (Plot size: 1m)					Hydrophytic Vegetation Present? Yes X No
1.					
2.					
			=Total Cover		
% Bare Ground in Herb Stratum		70			
Remarks: Dominance test indicator present.					

SOIL

Sampling Point: SP3

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		
0-10	10YR 3/2	100					Loamy/Clayey	Sandy loam
10-16	10YR 3/2	100					Loamy/Clayey	Sandy cobbly 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.)			Indicators for Problematic Hydric Soils ³ :	
☐ Histosol (A1)	☐ Sandy Gleyed Matrix (S4)	☐ 2 cm Muck (A10) (LRR A, E)		
☐ Histic Epipedon (A2)	☐ Sandy Redox (S5)	☐ Iron-Manganese Masses (F12) (LRR D)		
☐ Black Histic (A3)	☐ Stripped Matrix (S6)	☐ Red Parent Material (F21)		
☐ Hydrogen Sulfide (A4)	☐ Loamy Mucky Mineral (F1) (except MLRA 1)	☐ Very Shallow Dark Surface (F22)		
☐ 1 cm Muck (A9) (LRR D, G)	☐ Loamy Gleyed Matrix (F2)	☐ Other (Explain in Remarks)		
☐ Depleted Below Dark Surface (A11)	☐ Depleted Matrix (F3)			
☐ Thick Dark Surface (A12)	☐ Redox Dark Surface (F6)			
☐ Iron Monosulfide (A18)	☐ Depleted Dark Surface (F7)			
☐ Sandy Mucky Mineral (S1)	☐ Redox Depressions (F8)			
☐ 2.5 cm Mucky Peat or Peat (S2) (LRR G)				

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

Restrictive Layer (if observed):		Hydric Soil Present?	
Type: _____		Yes _____	No <u>X</u>
Depth (inches): _____			

Remarks:
Approximately 0.5 inches of recent flood deposited sand at surface. No soil indicators present.

HYDROLOGY

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

Field Observations:				Wetland Hydrology Present?	
Surface Water Present?	Yes _____	No _____	Depth (inches): _____	Yes <u>X</u>	No _____
Water Table Present?	Yes _____	No _____	Depth (inches): _____		
Saturation Present?	Yes <u>X</u>	No _____	Depth (inches): <u>0</u>		
(includes capillary fringe)					

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

Remarks:
Saturated to surface. Sediment and drift deposits from December 2025 flood.

U.S. Army Corps of Engineers				OMB Control #: 0710-0024, Exp: 9/30/2027	
WETLAND DETERMINATION DATA SHEET – Western Mountains, Valleys, and Coast Region				Requirement Control Symbol EXEMPT:	
See ERDC/EL TR-10-3; the proponent agency is CECW-CO-R				(Authority: AR 335-15, paragraph 5-2a)	
Project/Site: Sultan ELJ 9 and 10		City/County: Snohomish County		Sampling Date: 1/27/26	
Applicant/Owner: Snohomish County PUD No. 1		State: WA		Sampling Point: SP4	
Investigator(s): L. Hansen, D. Rapoza		Section, Township, Range: S31, T28N, R08E			
Landform (hillside, terrace, etc.): floodplain		Local relief (concave, convex, none): none		Slope (%): 1	
Subregion (LRR/MLRA): LRR A, MLRA 2		Lat: 47.87283°		Long: -121.82499°	
Soil Map Unit Name: Pilchuck loamy sand		Datum: NAD 1983			
Soil Map Unit Name: Pilchuck loamy sand		NW1 classification: PFO1C			
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)					
Are Vegetation, Soil, or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No					
Are Vegetation, Soil, or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)					
SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.					
Hydrophytic Vegetation Present? Yes X No			Is the Sampled Area within a Wetland? Yes X No		
Hydric Soil Present? Yes X No					
Wetland Hydrology Present? Yes X No					
Remarks: Wetland B. Located approximately 2 feet from OHWM. Vegetation, soil, and hydrology indicators present.					
VEGETATION – Use scientific names of plants.					
Tree Stratum (Plot size: 3m)		Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A) Total Number of Dominant Species Across All Strata: 4 (B) Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)
1.					
2.					
3.					
4.					
			=Total Cover		
Sapling/Shrub Stratum (Plot size: 2m)					Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species x 1 = FACW species x 2 = FAC species x 3 = FACU species x 4 = UPL species x 5 = Column Totals: (A) (B) Prevalence Index = B/A =
1. Salix lasiandra		7	Yes	FACW	
2.					
3.					
4.					
5.					
		7	=Total Cover		
Herb Stratum (Plot size: 1m)					Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation X 2 - Dominance Test is >50% 3 - Prevalence Index is ≤3.0 ¹ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) 5 - Wetland Non-Vascular Plants ¹ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. Carex obnupta		40	Yes	OBL	
2. Phalaris arundinacea		30	Yes	FACW	
3. Juncus effusus		20	Yes	FACW	
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
		90	=Total Cover		
Woody Vine Stratum (Plot size: 1m)					Hydrophytic Vegetation Present? Yes X No
1.					
2.					
			=Total Cover		
% Bare Ground in Herb Stratum 10					
Remarks: Bare ground is primarily and flood deposits. Dominance test indicator present.					

SOIL

Sampling Point: SP4

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		
0-4	2.5Y 3/1	93	10Y 3/4	7	C	M	Sandy	Prominent redox concentrations
4-16	2.5Y 3/1	100					Loamy/Clayey	

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.)			Indicators for Problematic Hydric Soils ³ :	
☐ Histosol (A1)	☐ Sandy Gleyed Matrix (S4)		☐ 2 cm Muck (A10) (LRR A, E)	
☐ Histic Epipedon (A2)	☒ Sandy Redox (S5)		☐ Iron-Manganese Masses (F12) (LRR D)	
☐ Black Histic (A3)	☐ Stripped Matrix (S6)		☐ Red Parent Material (F21)	
☐ Hydrogen Sulfide (A4)	☐ Loamy Mucky Mineral (F1) (except MLRA 1)		☐ Very Shallow Dark Surface (F22)	
☐ 1 cm Muck (A9) (LRR D, G)	☐ Loamy Gleyed Matrix (F2)		☐ Other (Explain in Remarks)	
☐ Depleted Below Dark Surface (A11)	☐ Depleted Matrix (F3)			
☐ Thick Dark Surface (A12)	☐ Redox Dark Surface (F6)			
☐ Iron Monosulfide (A18)	☐ Depleted Dark Surface (F7)			
☐ Sandy Mucky Mineral (S1)	☐ Redox Depressions (F8)			
☐ 2.5 cm Mucky Peat or Peat (S2) (LRR G)				

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

Restrictive Layer (if observed):		Hydric Soil Present?	
Type: _____		Yes	☒ No ☐
Depth (inches): _____			

Remarks:
Sandy redox indicator present.

HYDROLOGY

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

Field Observations:				Wetland Hydrology Present?	
Surface Water Present?	Yes ☐ No ☐	Depth (inches): _____		Yes	☒ No ☐
Water Table Present?	Yes ☒ No ☐	Depth (inches): <u>4</u>			
Saturation Present?	Yes ☒ No ☐	Depth (inches): <u>0</u>			
(includes capillary fringe)					

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

Remarks:
Saturated to surface.

U.S. Army Corps of Engineers				OMB Control #: 0710-0024, Exp: 9/30/2027 Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)	
WETLAND DETERMINATION DATA SHEET – Western Mountains, Valleys, and Coast Region See ERDC/EL TR-10-3; the proponent agency is CECW-CO-R					
Project/Site: Sultan ELJ 9 and 10		City/County: Snohomish County		Sampling Date: 1/27/26	
Applicant/Owner: Snohomish County PUD No. 1		State: WA		Sampling Point: SP5	
Investigator(s): L. Hansen, D. Rapoza		Section, Township, Range: S31, T28N, R08E			
Landform (hillside, terrace, etc.): floodplain		Local relief (concave, convex, none): none		Slope (%): 2	
Subregion (LRR/MLRA): LRR A, MLRA 2		Lat: 47.87256°		Long: -121.82563° Datum: NAD 1983	
Soil Map Unit Name: Water		NWI classification: PFO1C			
Are climatic / hydrologic conditions on the site typical for this time of year? Yes <u>X</u> No <u> </u> (If no, explain in Remarks.)					
Are Vegetation <u> </u> , Soil <u> </u> , or Hydrology <u> </u> significantly disturbed? Are "Normal Circumstances" present? Yes <u>X</u> No <u> </u>					
Are Vegetation <u> </u> , Soil <u> </u> , or Hydrology <u> </u> 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 <u>X</u> No <u> </u>			Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>		
Hydric Soil Present? Yes <u> </u> No <u>X</u>					
Wetland Hydrology Present? Yes <u> </u> No <u>X</u>					
Remarks: Upland. Located in low point in deciduous forest between Sultan River and Side Channel. No vegetation, soil, or hydrology indicators present.					
VEGETATION – Use scientific names of plants.					
Tree Stratum (Plot size: 3m)		Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A) Total Number of Dominant Species Across All Strata: 5 (B) Percent of Dominant Species That Are OBL, FACW, or FAC: 80.0% (A/B)
1. Thuja plicata		25	Yes	FAC	
2. Populus balsamifera		50	Yes	FAC	
3.					
4.					
		75 =Total Cover			
Sapling/Shrub Stratum (Plot size: 2m)					Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species x 1 = FACW species x 2 = FAC species x 3 = FACU species x 4 = UPL species x 5 = Column Totals: (A) (B) Prevalence Index = B/A =
1. Rubus spectabilis		10	Yes	FAC	
2. Acer circinatum		25	Yes	FAC	
3. Ilex aquifolium		2	No	FACU	
4. Rubus ursinus		5	No	FACU	
		42 =Total Cover			
Herb Stratum (Plot size: 1m)					Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation X 2 - Dominance Test is >50% 3 - Prevalence Index is ≤3.0 ¹ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) 5 - Wetland Non-Vascular Plants ¹ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. Polystichum munitum		5	Yes	FACU	
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
		5 =Total Cover			
Woody Vine Stratum (Plot size: 1m)					Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
1.					
2.					
		=Total Cover			
% Bare Ground in Herb Stratum 95					
Remarks: Dominance test indicator met.					

SOIL

Sampling Point: SP5

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		
0-12	2.5Y 3/2	100					Loamy/Clayey	sandy loam
12-16	2.5Y 3/2	100					Sandy	loamy sand

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.)			Indicators for Problematic Hydric Soils ³ :	
☐ Histosol (A1)	☐ Sandy Gleyed Matrix (S4)	☐ 2 cm Muck (A10) (LRR A, E)		
☐ Histic Epipedon (A2)	☐ Sandy Redox (S5)	☐ Iron-Manganese Masses (F12) (LRR D)		
☐ Black Histic (A3)	☐ Stripped Matrix (S6)	☐ Red Parent Material (F21)		
☐ Hydrogen Sulfide (A4)	☐ Loamy Mucky Mineral (F1) (except MLRA 1)	☐ Very Shallow Dark Surface (F22)		
☐ 1 cm Muck (A9) (LRR D, G)	☐ Loamy Gleyed Matrix (F2)	☐ Other (Explain in Remarks)		
☐ Depleted Below Dark Surface (A11)	☐ Depleted Matrix (F3)			
☐ Thick Dark Surface (A12)	☐ Redox Dark Surface (F6)			
☐ Iron Monosulfide (A18)	☐ Depleted Dark Surface (F7)			
☐ Sandy Mucky Mineral (S1)	☐ Redox Depressions (F8)			
☐ 2.5 cm Mucky Peat or Peat (S2) (LRR G)				

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

Restrictive Layer (if observed):		Hydric Soil Present?	
Type: _____		Yes _____	No <u>X</u>
Depth (inches): _____			

Remarks:
No soil indicators present.

HYDROLOGY

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

Field Observations:				Wetland Hydrology Present?	
Surface Water Present?	Yes _____	No _____	Depth (inches): _____	Yes _____	No <u>X</u>
Water Table Present?	Yes _____	No _____	Depth (inches): _____		
Saturation Present?	Yes _____	No _____	Depth (inches): _____		
(includes capillary fringe)					

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

Remarks:
No hydrology indicators present.

Appendix C

Wetland Rating Forms

Wetland name or number: A

RATING SUMMARY - Western Washington

Name of wetland (or ID#): A Date of site visit: 01/27/2026

Rated By: Danielle Rapoza Trained by Ecology? Yes ☒ No ☐ Date of Training: N/A

HGM Class used for rating: Riverine

Wetland has multiple HGM classes? Yes ☐ No ☒

NOTE: Form is not complete without the figures requested (figures can be combined).

Source of base aerial photo/map: WATOR

OVERALL WETLAND CATEGORY: [Category III] (based on functions ☒ or special characteristics ☐)

1. Category of wetland based on FUNCTIONS

- ☐ **Category I** - Total score = 23 - 27
☐ **Category II** - Total score = 20 - 22
☒ **Category III** - Total score = 16 - 19
☐ **Category IV** - Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
Site Potential	L	L	L	
Landscape Potential	L	M	H	
Value	H	H	H	Total
Score Based on Ratings	5	6	7	18

Score for each function based on three ratings

(order of ratings is not important)

9 = H,H,H

8 = H,H,M

7 = H,H,L

7 = H,M,M

6 = H,M,L

6 = M,M,M

5 = H,L,L

5 = M,M,L

4 = M,L,L

3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	
Wetland of High Conservation Value	
Bog	
Forested	
Coastal Lagoon	
Interdunal	
None of the above	Not Applicable

Wetland name or number: A

Maps and figures required to answer questions correctly for Western Washington

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	A1
Hydroperiods	H 1.2	A2
Ponded depressions	R 1.1	A3
Boundary of area within 150 ft of the wetland (<i>can be added to another figure</i>)	R 2.4	A4
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	A5
Width of unit vs. width of stream (<i>can be added to another figure</i>)	R 4.1	A6
Map of the contributing basin	R 2.2, R 2.3, R 5.2	A7
1km Polygon: Area that extends 1km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	A8
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	A9
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	A10

Wetland name or number: A

RIVERINE AND FRESHWATER TIDAL FRINGE WETLANDS**Water Quality Functions** - Indicators that the site functions to improve water quality**R 1.0 Does the site have the potential to improve water quality?****R 1.1** What is the total area of surface depressions within the Riverine wetland that can trap sediments during a flooding event?

Depressions cover >75% area of wetland	points = 8	
Depressions cover >50% area of wetland	points = 4	
Depressions present but cover <50% area of wetland	points = 2	
No depressions present	points = 0	Score: 2

R 1.2 What is the structure of plants in the wetland?

Trees or shrubs cover >66% area of the wetland	points = 8	
Trees or shrubs cover 33% - 66% of the area of the wetland	points = 6	
Ungrazed, herbaceous plants cover (>6in high) >66% area of the wetland	points = 6	
Ungrazed, herbaceous plants cover (>6in high) 33%-66% of the area of the wetland	points = 3	
Trees, shrubs, and ungrazed herbaceous plants cover <33% area of the wetland	points = 0	Score: 3

Total for R 1:**5****Rating of Site Potential**

[] 12-16 = H [] 6-11 = M [X] 0-5 = L

Record the rating on the first page

R 2.0 Does the landscape have the potential to support the water quality function of the site?**R 2.1** Is the wetland within an incorporated city or within its UGA?

Yes	points = 2	
No	points = 0	Score: 0

R 2.2 Does the contributing basin to the wetland include a UGA or incorporated area?

Yes	points = 1	
No	points = 0	Score: 0

R 2.3 Does at least 10% of the contributing basin contain tilled fields, pastures, or forests that have been clearcut within the last 5 years?

Yes	points = 1	
No	points = 0	Score: 0

R 2.4 Is >10% of the area within 150ft of the wetland in land uses that generate pollutants?

Yes	points = 1	
No	points = 0	Score: 0

R 2.5 Are there other sources of pollutants coming into the wetland that are not listed in question R 2.1-R 2.4?

Yes	points = 1	
No	points = 0	Score: 0

R 2.6 What are the other sources of pollutants coming into the wetland?**Total for R 2:****0****Rating of Landscape Potential**

[] 3-4 = H [] 1-2 = M [X] 0 = L

Record the rating on the first page

Wetland name or number: A

R 3.0 Is the water quality improvement provided by the site valuable to society?		
R 3.1 <u>Is the wetland along a stream or river that is on the 303(d) list or on a tributary that drains to one within 1 mi?</u>		
Yes	points = 1	
No	points = 0	Score: 0
R 3.2 <u>Is the wetland along a stream or river that has TMDL limits for nutrients, toxics, or pathogens?</u>		
Yes	points = 1	
No	points = 0	Score: 0
R 3.3 <u>Has the site been identified in a watershed or local plan as important for maintaining water quality?</u>		
Yes	points = 2	
No	points = 0	Score: 2
Total for R 3:		2

Rating of Value

[X] 2-4 = H [] 1 = M [] 0 = L

Record the rating on the first page

<u>RIVERINE AND FRESHWATER TIDAL FRINGE WETLANDS</u> Hydrologic Functions - Indicators that the site functions to reduce flooding and stream degradation		
R 4.0 Does the site have the potential to reduce flooding and erosion?		
R 4.1 <u>What are the characteristics of the overbank storage the wetland provides?</u>		
If the ratio is more than 20	points = 9	
If the ratio is 10-20	points = 6	
If the ratio is 5-<10	points = 4	
If the ratio is 1-<5	points = 2	
If the ratio is < 1	points = 1	Score: 1
R 4.2 <u>What are the characteristics of plants that slow down water velocities during floods?</u>		
Forest or shrubs cover >33% of the wetland area OR emergent plants cover >66% of the wetland area	points = 7	
Forest or shrubs cover >10% of the wetland area OR emergent plants cover >33% of the wetland area	points = 4	
Plants do not meet the above criteria	points = 0	Score: 4
Total for R 4:		5

Rating of Site Potential

[] 12-16 = H [] 6-11 = M [X] 0-5 = L

Record the rating on the first page

Wetland name or number: A

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

Rating of Landscape Potential

[] 3 = H [X] 1-2 = M [] 0 = L

Record the rating on the first page

R 6.0 Are the hydrologic functions provided by the site valuable to society?		
R 6.1 <u>What is the distance to the nearest areas downstream that have flooding problems?</u>		
The sub-basin immediately down-gradient of the wetland has flooding problems	points = 2	
Surface flooding problems are in a sub-basin farther down-gradient	points = 1	
No flooding problems anywhere downstream	points = 0	Score: 2
R 6.2 <u>Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan?</u>		
Yes	points = 2	
No	points = 0	Score: 0
Total for R 6:		2

Rating of Value

[X] 2-4 = H [] 1 = M [] 0 = L

Record the rating on the first page

Wetland name or number: A

HABITAT FUNCTIONS

These questions apply to wetlands of all HGM classes - Indicators that the site functions to provide important habitat

H 1.0 Does the wetland have the potential to provide habitat for many species?

H 1.1 What is the structure of the plant community?

- ☐ Aquatic Bed
- ☒ Emergent
- ☐ Scrub-shrub
- ☐ Forested
- ☐ Multiple strata within the Forested class (canopy, sub-canopy, shrubs, herbaceous, moss/ground cover)

4 structures or more	points = 4
3 structures	points = 2
2 structures	points = 1
1 structure	points = 0
No structures present	points = 0

Score: 0

H 1.2 What are the hydroperiods that meet the size thresholds in the wetland?

- ☐ Permanently flooded or inundated
- ☒ Seasonally flooded or inundated
- ☒ Occasionally flooded or inundated
- ☐ Saturated only
- ☒ Permanently flowing stream or river in, or adjacent to, the wetland
- ☐ Seasonally flowing stream in, or adjacent to, the wetland
- ☐ Lake Fringe wetland
- ☐ Freshwater Tidal wetland

4 or more types present	points = 3
3 types present or Lake Fringe / Freshwater Tidal Fringe	points = 2
2 types present	points = 1
1 type present	points = 0
None present	points = 0

Score: 2

H 1.3 What is the richness of the plant species in the wetland?

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

Score: 0

Wetland name or number: A**H 1.4** What is the interspersation of habitats?

High	points = 3	
Moderate	points = 2	
Low	points = 1	
None	points = 0	Score: 0

H 1.5 What are the special habitat features in the wetland?

- ☐ Large, downed, woody debris within the wetland (>4in diameter and 6ft long).
- ☐ Standing snags (dbh >4in) within the wetland
- ☐ Undercut banks are present for at least 6.6ft (2m) and/or overhanging plants extend at least 3.3ft (1m) over open water or a stream (or ditch) in, or contiguous with the wetland, for at least 33ft (10m)
- ☒ Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30 degree slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not yet weathered where wood is exposed)
- ☐ At least 0.25ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (structures for egg-laying by amphibians)
- ☐ Invasive plants cover less than 25% of the wetland area in every stratum of plants (see H 1.1 for list of strata)

6 habitats selected	points = 6	
5 habitats selected	points = 5	
4 habitats selected	points = 4	
3 habitats selected	points = 3	
2 habitats selected	points = 2	
1 habitat selected	points = 1	
No habitats selected	points = 0	Score: 1

Total for H 1: 3**Rating of Site Potential**

[] 15-18 = H [] 7-14 = M [X] 0-6 = L

*Record the rating on the first page***H 2.0 Does the landscape have the potential to support habitat functions of the site?****H 2.1** What is the percentage of accessible habitat within 1km of the wetland?

>33% of 1km Polygon	points = 3	
20-33% of 1km Polygon	points = 2	
10-19% of 1km Polygon	points = 1	
<10% of 1km Polygon	points = 0	Score: 3

H 2.2 What is the percentage of total habitat in a 1km polygon around the wetland?

Total habitat is >50% of the Polygon	points = 3	
Total habitat is 10-50% of the Polygon and in 1-3 patches	points = 2	
Total habitat is 10-50% of the Polygon and in >3 patches	points = 1	
Total habitat is <10% of the Polygon	points = 0	Score: 1

Wetland name or number: A**H 2.3** What is the land use intensity in the 1km polygon?

50% of the Polygon is high intensity land use

points = -2

<50% of the Polygon is high intensity land use

points = 0

Score: 0**Total for H 2:****4****Rating of Landscape Potential**

[X] 4-6 = H [] 1-3 = M [] 0 = L

*Record the rating on the first page***H 3.0 Is the habitat provided by the site valuable to society?****H 3.1** Does the site provide habitat for species valued in laws, regulations, or policies?

- ☐ Aspen Stands
- ☐ Biodiversity Areas and Corridors
- ☐ Herbaceous Balds
- ☐ Old-growth/Mature Forests
- ☐ Oregon White Oak
- ☒ Riparian
- ☐ Westside Prairie
- ☐ Fresh Deepwater
- ☒ Instream
- ☐ Nearshore (Coastal, Open Coast, Puget Sound)
- ☐ Caves
- ☐ Cliffs
- ☒ Snags and Logs
- ☐ Talus

The following criteria automatically score 2 points:

- ☒ The wetland provides habitat for Threatened or Endangered species
- ☐ The wetland is mapped as a location for an individual WDFW priority species
- ☐ The wetland is a Wetland of High Conservation Value
- ☐ The wetland has been categorized as an important habitat site in a local plan

The wetland has 3 or more WDFW priority habitats within 100m, or meets the criteria for societal value

points = 2

The site has 1 or 2 WDFW priority habitats within 100m

points = 1

The site does not meet any of the criteria for societal value

points = 0

Score: 2**Total for H 3:****2****Rating of Value**

[X] 2 = H [] 1 = M [] 0 = L

Record the rating on the first page

Wetland name or number: A

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

SC 1.0 Estuarine Wetlands

SC 1.1 Does the wetland meet all of the following criteria for Estuarine wetlands?

- ☐ The dominant water regime is tidal
- ☐ The wetland is vegetated
- ☐ The water salinity is greater than 0.5 ppt

Yes - Go to SC 1.2

No - Not an Estuarine Wetland

**Result: Not an
Estuarine Wetland**

SC 1.2 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 Estuarine Wetland

No - Go to SC 1.3

Result:

SC 1.3 Is the wetland unit at least 1ac 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.
- ☐ At least 75% of the landward edge of the wetland has a 100ft buffer of shrub, forest, or un-grazed or un-mowed grassland
- ☐ The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.

Yes - Category I Estuarine Wetland

No - Category II Estuarine Wetland

Result:

SC 2.0 Wetlands of High Conservation Value

SC 2.1 Does the wetland overlap with any known or historical rare plant or rare & high-quality ecosystem polygons on the WNHP Data Explorer?

Yes - Category I Wetland of High Conservation Value

No - Go to SC 2.2

Result: Go to SC 2.2

SC 2.2 Does the wetland have a rare plant species, rare plant community, or high-quality common plant community that may qualify the site as a WHCV?

Yes - Category I Wetland of High Conservation Value

No - Not a Wetland of High Conservation Value

**Result: Not a Wetland
of High Conservation
Value**

Wetland name or number: A

SC 3.0 Bogs

SC 3.1 Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16in or more of the first 32in of the soil profile?

Yes - Go to SC 3.3

No - Go to SC 3.2

Result: 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 - Not a Bog Wetland

Result:

SC 3.3 Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least 30% cover of plant species listed in the table provided in the instructions?

Yes - Category I Bog Wetland

No - Go to SC 3.4

Result:

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 combinations of species) listed in the table found in the instructions provide more than 30% of the cover under the canopy?

Yes - Category I Bog Wetland

No - Not a Bog Wetland

Result:

SC 4.0 Forested Wetlands

SC 4.1 Does the wetland have at least 1 contiguous acre of forest that meets one of the following criteria?

☐ Old-growth forests

☐ Mature forests

Yes - Category I Forested Wetland

No - Not a Forested Wetland

Result: Not a Forested Wetland

Wetland name or number: A

SC 5.0 Wetlands in Coastal Lagoons

SC 5.1 Coastal Lagoons: Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?

- ☐ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or rocks
- ☐ The depression in which the wetland is located contains ponded water that is saline or brackish (>0.5 ppt) during most of the year in at least a portion of the open water area (measured near the bottom)
- ☐ The lagoon retains some of its surface water at low tide during spring tides

Yes - Go to SC 5.2

No - Not a Coastal Lagoon Wetland

Result: Not a Coastal Lagoon Wetland

SC 5.2 Does the wetland meet all of the following three conditions?

- ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species).
- ☐ At least 75% of the landward edge of the wetland has a 100ft buffer of shrub, forest, or un-grazed or un-mowed grassland.
- ☐ the wetland is larger than 0.10ac (4350 sqft)

Yes - Category I Coastal Lagoon

No - Category II Coastal Lagoon

Result:

SC 6.0 Interdunal Wetlands

SC 6.1 Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership WBUO)?

Yes - Go to SC 6.2

No - Not an Interdunal Wetland

Result: Not an Interdunal Wetland

SC 6.2 Is the wetland 1ac or larger in size, or a mosaic that is 1ac or larger in size?

Wetland is larger than 1ac in size - Go to SC 6.3

Wetland is a mosaic larger than 1ac in size - Category II Interdunal Wetland

No - Go to SC 6.4

Result:

SC 6.3 Does the wetland score 8 or 9 points for the habitat functions?

Yes - Category I Interdunal Wetland

No - Category II Interdunal Wetland

Result:

SC 6.4 Is the wetland unit between 0.1ac and 1ac, or in a mosaic of wetlands that is between 0.1ac and 1ac in size?

Yes - Category III Interdunal Wetland

No - Category IV Interdunal Wetland

Result:

Wetland name or number: A

Category of wetland based on Special Characteristics

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

Special Characteristics
Category: Not
Applicable

Wetland A

Figure A1 – Cowardin Plant Classes

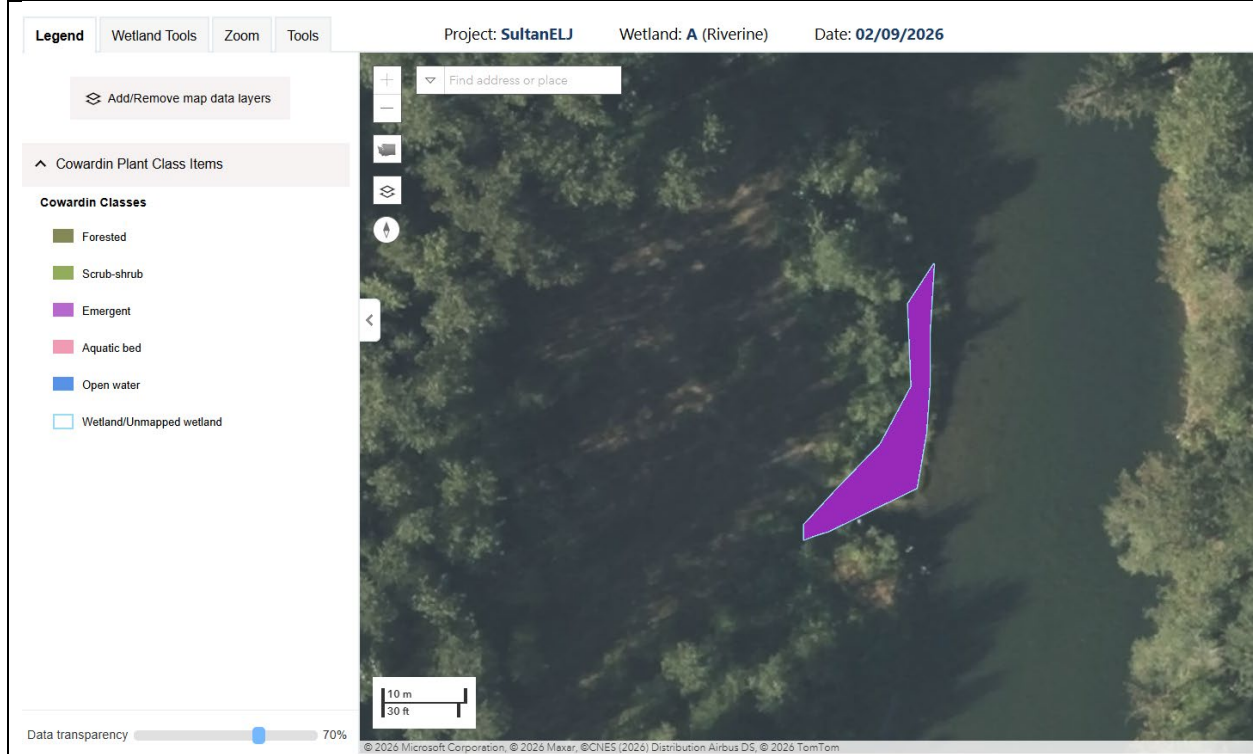
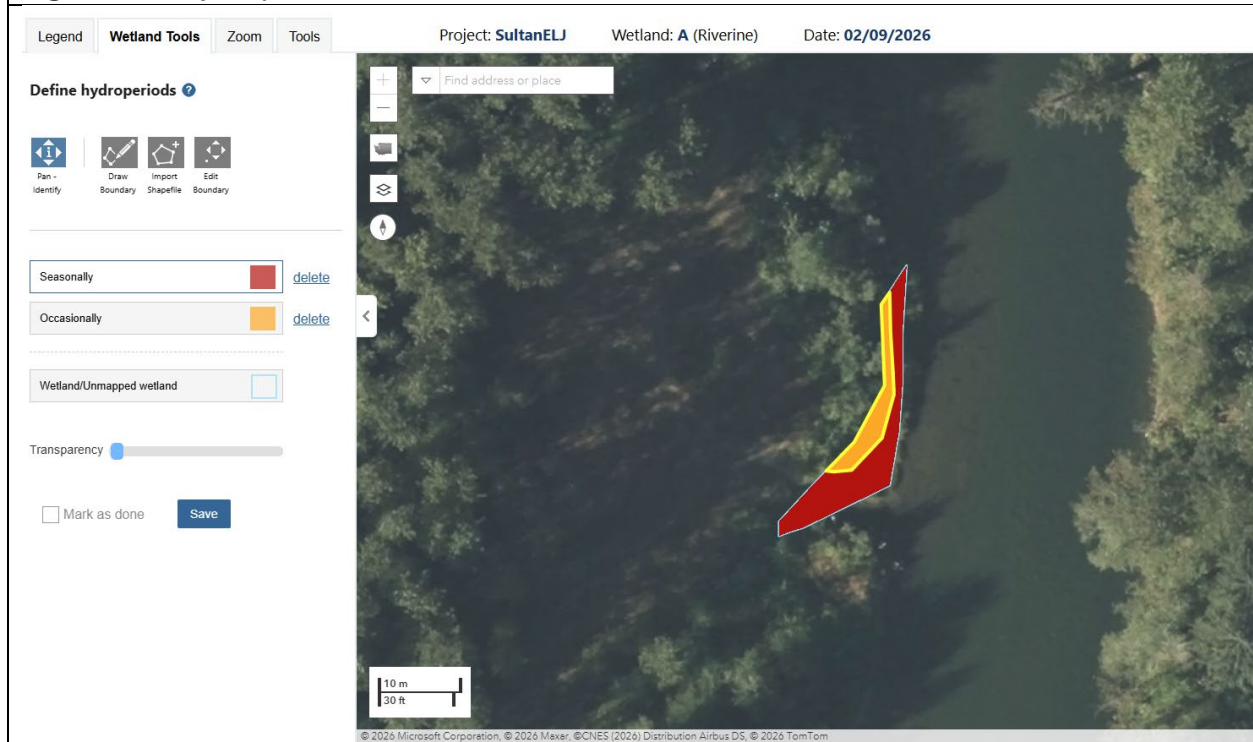


Figure A2 – Hydroperiods



Wetland A

Figure A3 – Ponded Depressions

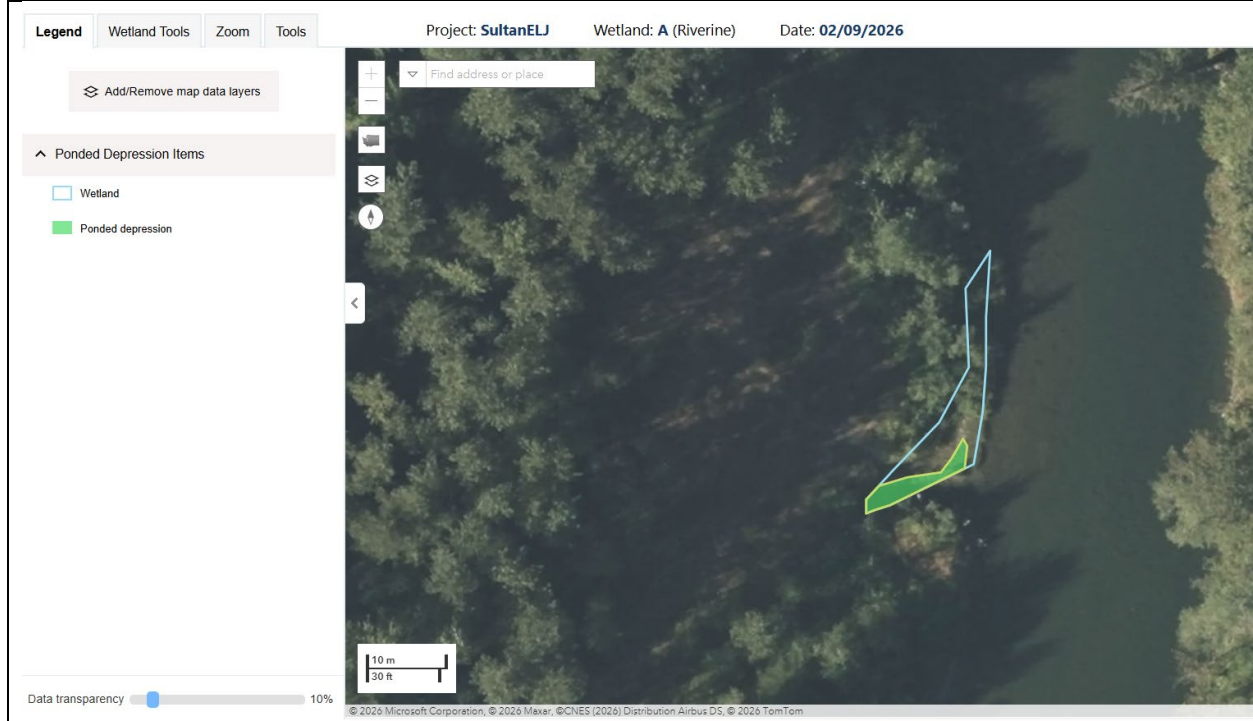
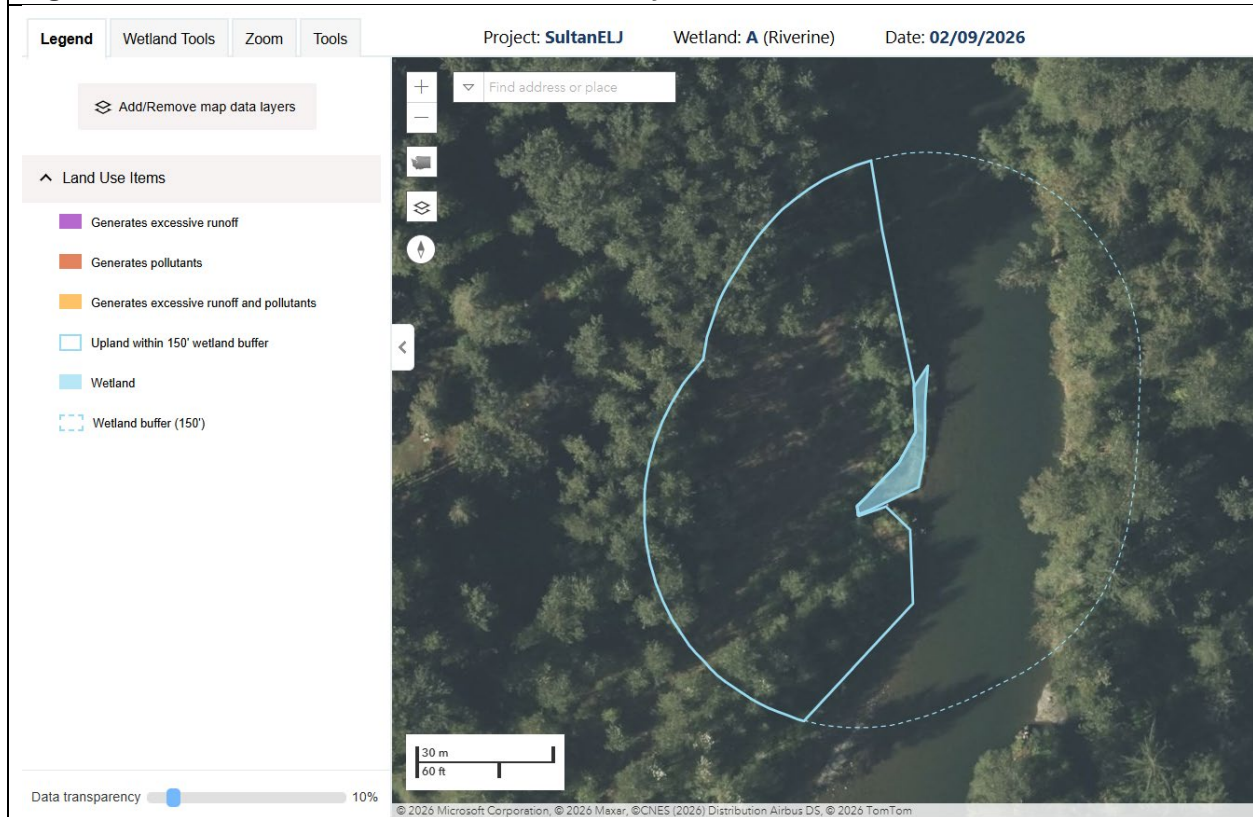


Figure A4 – Land Use Within 150-foot Boundary



Wetland A

Figure A5 – Plant Cover of Trees, Shrubs, and Herbaceous Plants

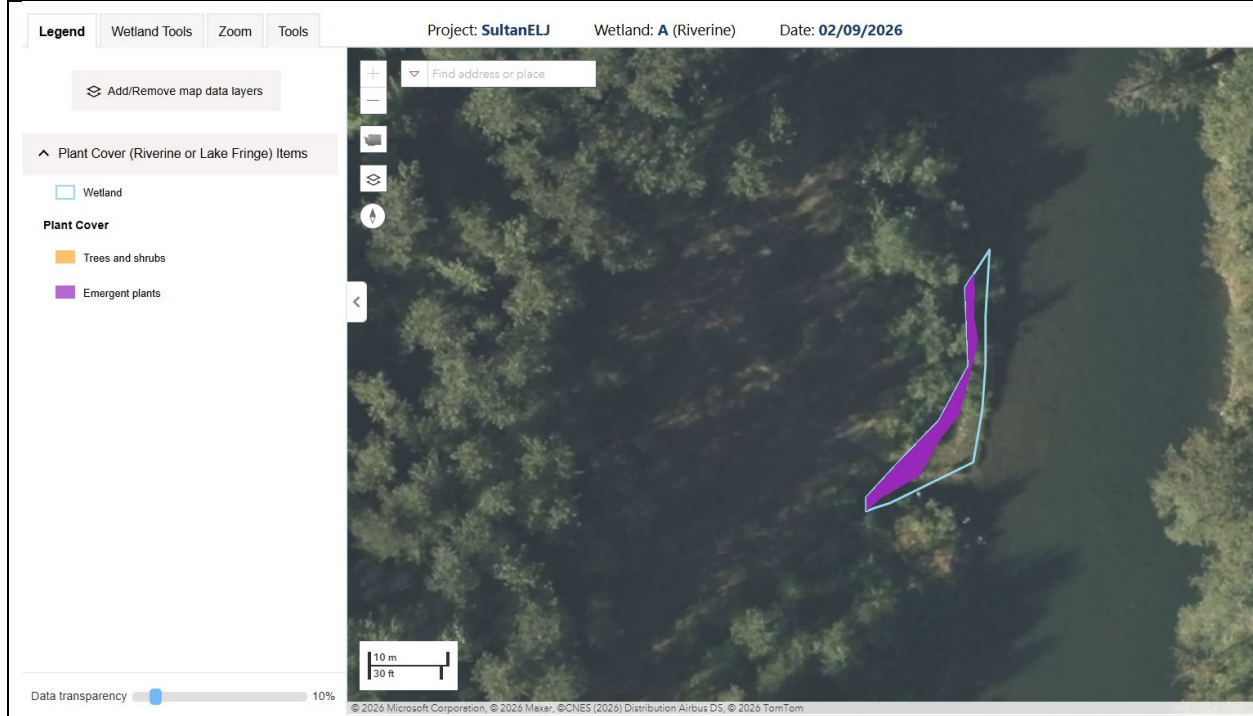
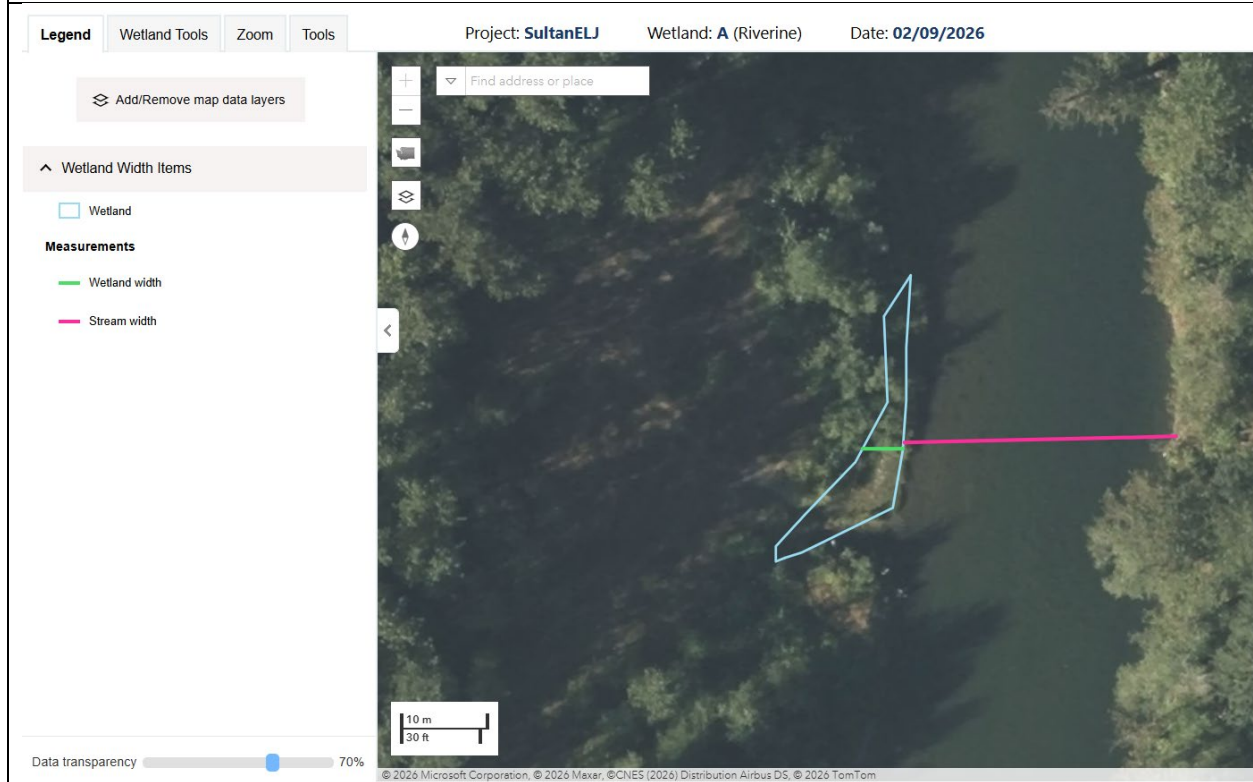


Figure A6 – Width of Unit vs. Width of Stream



Wetland A

Figure A7 – Map of Contributing Basin

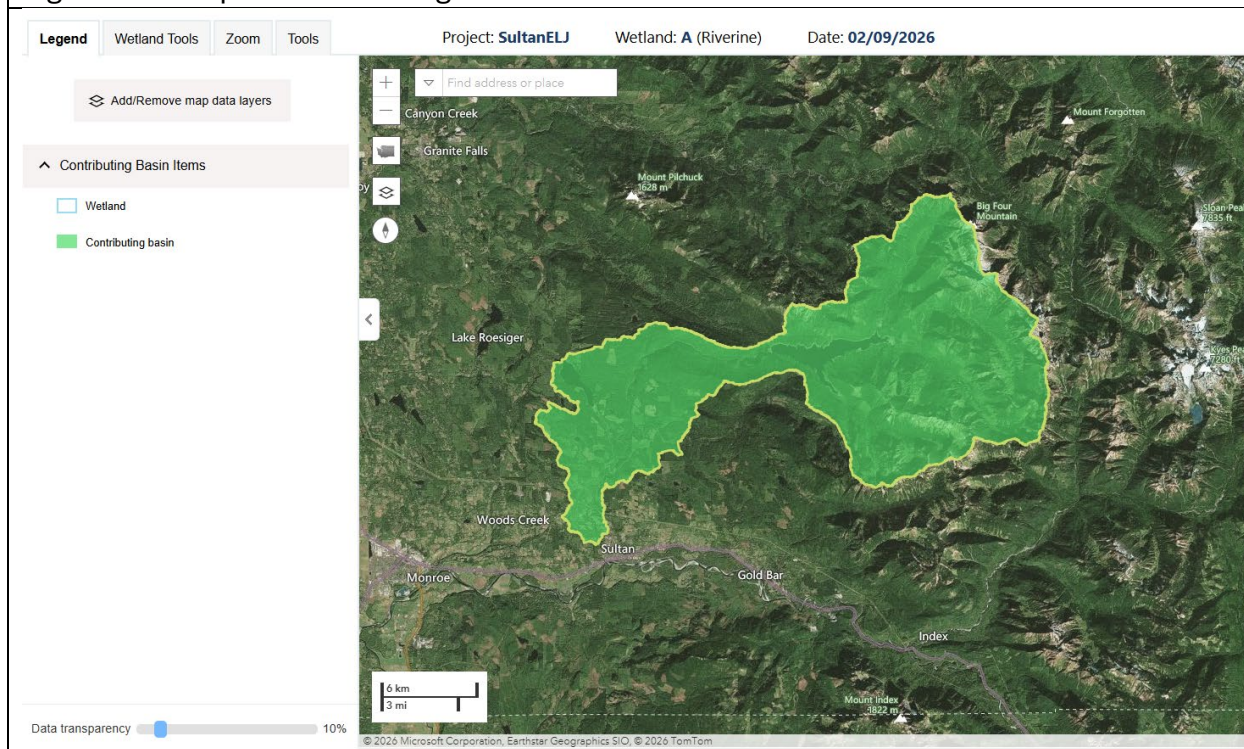
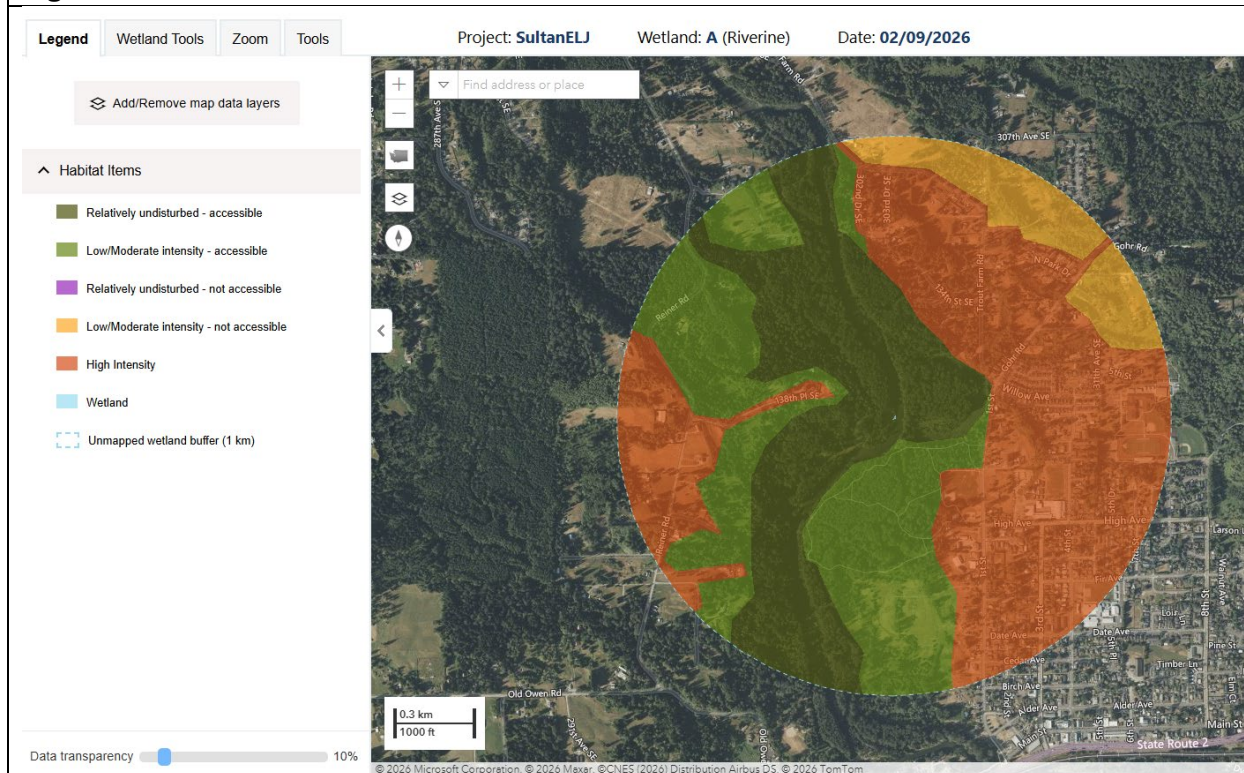


Figure A8 – Habitat within 1 km



Wetland A

Figure A9 – 303(d) Waters in Basin

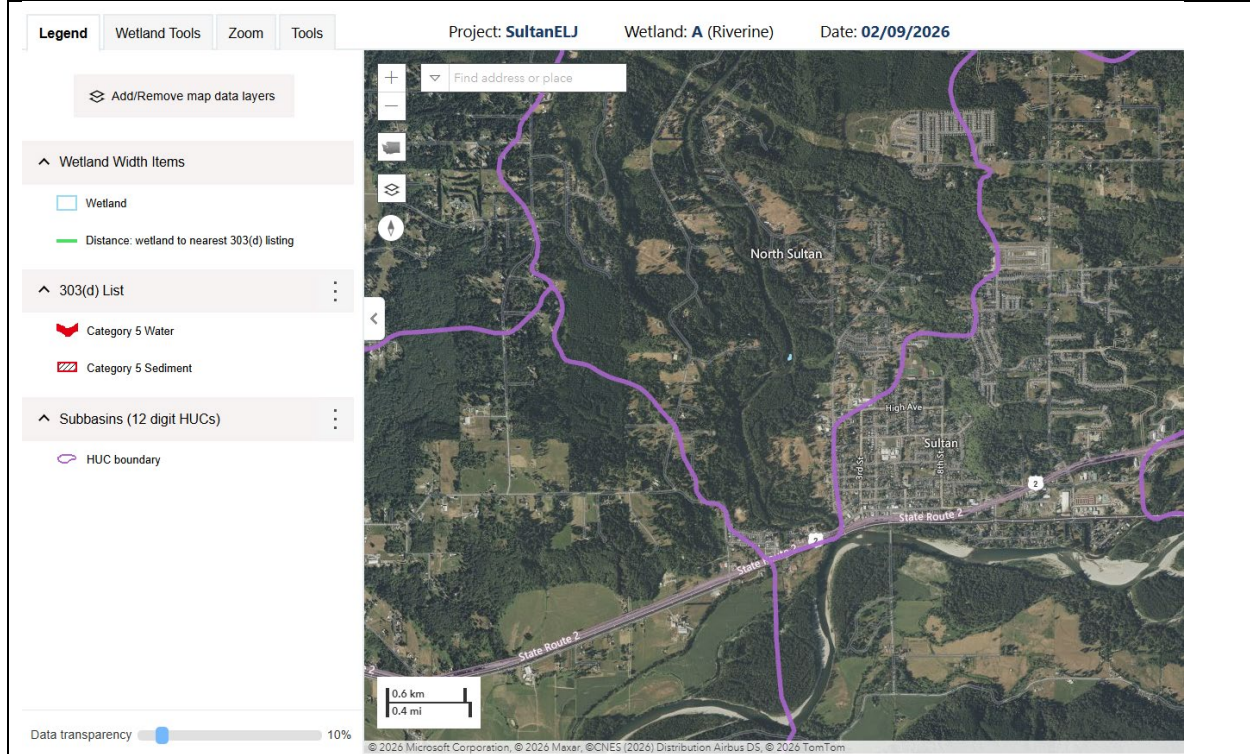
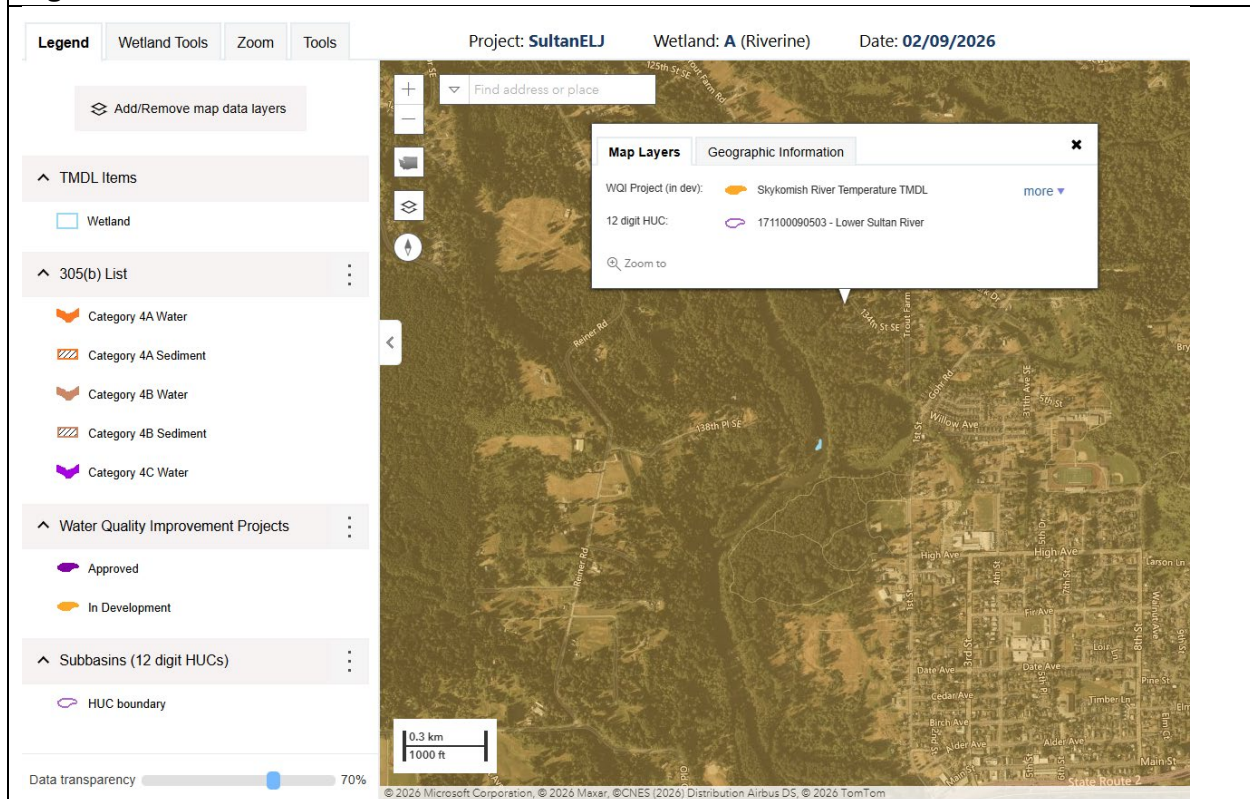
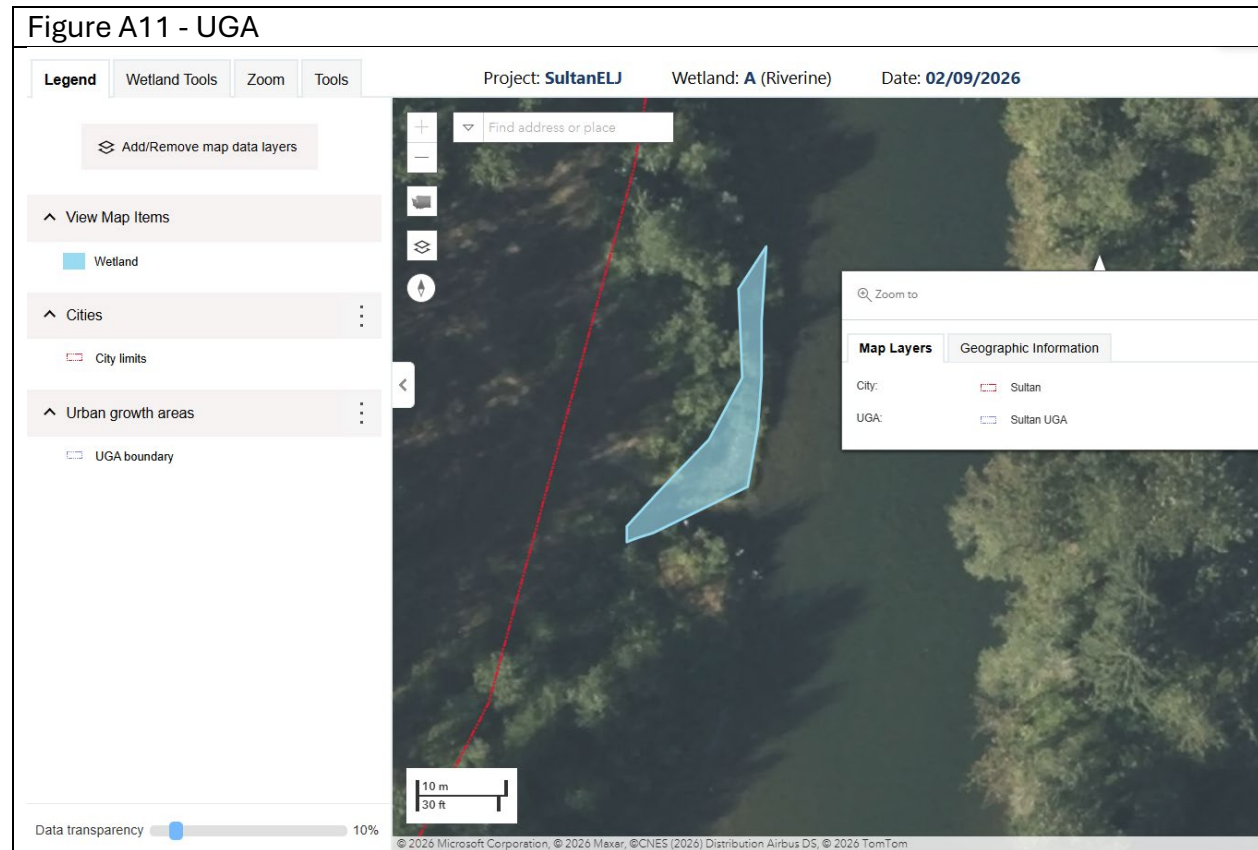


Figure A10 – TMDLs for WRIA



Wetland A



Although the wetland is technically inside the mapped UGA, the Sultan River's right bank falls under Snohomish County jurisdiction. This discrepancy has resulted from channel migration over time. Additionally, while the Sultan UGA is technically within this HUC-12, landscape drainage patterns cause water from the upgradient Sultan UGA to discharge downstream from the wetland. As a result, this negates the wetlands' potential for water quality improvement.

Wetland name or number: B

RATING SUMMARY - Western Washington

Name of wetland (or ID#): BDate of site visit: 01/27/2026

Rated By: Danielle RapozaTrained by Ecology? Yes [X] No []Date of Training: N/A

HGM Class used for rating: Riverine

Wetland has multiple HGM classes? Yes [] No [X]

NOTE: Form is not complete without the figures requested (figures can be combined).

Source of base aerial photo/map: WATOR

OVERALL WETLAND CATEGORY: [Category III] (based on functions [X] or special characteristics [])

1. Category of wetland based on FUNCTIONS

- [] Category I - Total score = 23 - 27
- [] Category II - Total score = 20 - 22
- [X] Category III - Total score = 16 - 19
- [] Category IV - Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
Site Potential	L	L	L	
Landscape Potential	L	M	H	
Value	H	H	H	Total
Score Based on Ratings	5	6	7	18

Score for each function based on three ratings

(order of ratings is not important)

9 = H,H,H

8 = H,H,M

7 = H,H,L

7 = H,M,M

6 = H,M,L

6 = M,M,M

5 = H,L,L

5 = M,M,L

4 = M,L,L

3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	
Wetland of High Conservation Value	
Bog	
Forested	
Coastal Lagoon	
Interdunal	
None of the above	Not Applicable

Wetland name or number: B

Maps and figures required to answer questions correctly for Western Washington

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	B1
Hydroperiods	H 1.2	B2
Ponded depressions	R 1.1	B3
Boundary of area within 150 ft of the wetland (<i>can be added to another figure</i>)	R 2.4	B4
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	B5
Width of unit vs. width of stream (<i>can be added to another figure</i>)	R 4.1	B6
Map of the contributing basin	R 2.2, R 2.3, R 5.2	B7
1km Polygon: Area that extends 1km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	B8
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	B9
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	B10

Wetland name or number: B

RIVERINE AND FRESHWATER TIDAL FRINGE WETLANDS**Water Quality Functions** - Indicators that the site functions to improve water quality**R 1.0 Does the site have the potential to improve water quality?****R 1.1** What is the total area of surface depressions within the Riverine wetland that can trap sediments during a flooding event?

Depressions cover >75% area of wetland	points = 8	
Depressions cover >50% area of wetland	points = 4	
Depressions present but cover <50% area of wetland	points = 2	
No depressions present	points = 0	Score: 0

R 1.2 What is the structure of plants in the wetland?

Trees or shrubs cover >66% area of the wetland	points = 8	
Trees or shrubs cover 33% - 66% of the area of the wetland	points = 6	
Ungrazed, herbaceous plants cover (>6in high) >66% area of the wetland	points = 6	
Ungrazed, herbaceous plants cover (>6in high) 33%-66% of the area of the wetland	points = 3	
Trees, shrubs, and ungrazed herbaceous plants cover <33% area of the wetland	points = 0	Score: 0

Total for R 1: **0****Rating of Site Potential**

[] 12-16 = H [] 6-11 = M [X] 0-5 = L

Record the rating on the first page

R 2.0 Does the landscape have the potential to support the water quality function of the site?**R 2.1** Is the wetland within an incorporated city or within its UGA?

Yes	points = 2	
No	points = 0	Score: 0

R 2.2 Does the contributing basin to the wetland include a UGA or incorporated area?

Yes	points = 1	
No	points = 0	Score: 0

R 2.3 Does at least 10% of the contributing basin contain tilled fields, pastures, or forests that have been clearcut within the last 5 years?

Yes	points = 1	
No	points = 0	Score: 0

R 2.4 Is >10% of the area within 150ft of the wetland in land uses that generate pollutants?

Yes	points = 1	
No	points = 0	Score: 0

R 2.5 Are there other sources of pollutants coming into the wetland that are not listed in question R 2.1-R 2.4?

Yes	points = 1	
No	points = 0	Score: 0

R 2.6 What are the other sources of pollutants coming into the wetland?**Total for R 2:** **0****Rating of Landscape Potential**

[] 3-4 = H [] 1-2 = M [X] 0 = L

Record the rating on the first page

Wetland name or number: B

R 3.0 Is the water quality improvement provided by the site valuable to society?		
R 3.1 <u>Is the wetland along a stream or river that is on the 303(d) list or on a tributary that drains to one within 1 mi?</u>		
Yes	points = 1	
No	points = 0	Score: 0
R 3.2 <u>Is the wetland along a stream or river that has TMDL limits for nutrients, toxics, or pathogens?</u>		
Yes	points = 1	
No	points = 0	Score: 0
R 3.3 <u>Has the site been identified in a watershed or local plan as important for maintaining water quality?</u>		
Yes	points = 2	
No	points = 0	Score: 2
Total for R 3:		2

Rating of Value

[X] 2-4 = H [] 1 = M [] 0 = L

Record the rating on the first page

<u>RIVERINE AND FRESHWATER TIDAL FRINGE WETLANDS</u> Hydrologic Functions - Indicators that the site functions to reduce flooding and stream degradation		
R 4.0 Does the site have the potential to reduce flooding and erosion?		
R 4.1 <u>What are the characteristics of the overbank storage the wetland provides?</u>		
If the ratio is more than 20	points = 9	
If the ratio is 10-20	points = 6	
If the ratio is 5-<10	points = 4	
If the ratio is 1-<5	points = 2	
If the ratio is < 1	points = 1	Score: 1
R 4.2 <u>What are the characteristics of plants that slow down water velocities during floods?</u>		
Forest or shrubs cover >33% of the wetland area OR emergent plants cover >66% of the wetland area	points = 7	
Forest or shrubs cover >10% of the wetland area OR emergent plants cover >33% of the wetland area	points = 4	
Plants do not meet the above criteria	points = 0	Score: 0
Total for R 4:		1

Rating of Site Potential

[] 12-16 = H [] 6-11 = M [X] 0-5 = L

Record the rating on the first page

Wetland name or number: B

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

Rating of Landscape Potential

[] 3 = H [X] 1-2 = M [] 0 = L

Record the rating on the first page

R 6.0 Are the hydrologic functions provided by the site valuable to society?		
R 6.1 <u>What is the distance to the nearest areas downstream that have flooding problems?</u>		
The sub-basin immediately down-gradient of the wetland has flooding problems	points = 2	
Surface flooding problems are in a sub-basin farther down-gradient	points = 1	
No flooding problems anywhere downstream	points = 0	Score: 2
R 6.2 <u>Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan?</u>		
Yes	points = 2	
No	points = 0	Score: 0
Total for R 6:		2

Rating of Value

[X] 2-4 = H [] 1 = M [] 0 = L

Record the rating on the first page

Wetland name or number: B

HABITAT FUNCTIONS

These questions apply to wetlands of all HGM classes - Indicators that the site functions to provide important habitat

H 1.0 Does the wetland have the potential to provide habitat for many species?

H 1.1 What is the structure of the plant community?

- ☐ Aquatic Bed
- ☒ Emergent
- ☐ Scrub-shrub
- ☐ Forested
- ☐ Multiple strata within the Forested class (canopy, sub-canopy, shrubs, herbaceous, moss/ground cover)

4 structures or more	points = 4
3 structures	points = 2
2 structures	points = 1
1 structure	points = 0
No structures present	points = 0

Score: 0

H 1.2 What are the hydroperiods that meet the size thresholds in the wetland?

- ☐ Permanently flooded or inundated
- ☒ Seasonally flooded or inundated
- ☒ Occasionally flooded or inundated
- ☐ Saturated only
- ☒ Permanently flowing stream or river in, or adjacent to, the wetland
- ☐ Seasonally flowing stream in, or adjacent to, the wetland
- ☐ Lake Fringe wetland
- ☐ Freshwater Tidal wetland

4 or more types present	points = 3
3 types present or Lake Fringe / Freshwater Tidal Fringe	points = 2
2 types present	points = 1
1 type present	points = 0
None present	points = 0

Score: 2

H 1.3 What is the richness of the plant species in the wetland?

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

Score: 0

Wetland name or number: B**H 1.4** What is the interspersation of habitats?

High	points = 3	
Moderate	points = 2	
Low	points = 1	
None	points = 0	Score: 0

H 1.5 What are the special habitat features in the wetland?

- ☐ Large, downed, woody debris within the wetland (>4in diameter and 6ft long).
- ☐ Standing snags (dbh >4in) within the wetland
- ☐ Undercut banks are present for at least 6.6ft (2m) and/or overhanging plants extend at least 3.3ft (1m) over open water or a stream (or ditch) in, or contiguous with the wetland, for at least 33ft (10m)
- ☒ Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30 degree slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not yet weathered where wood is exposed)
- ☐ At least 0.25ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (structures for egg-laying by amphibians)
- ☐ Invasive plants cover less than 25% of the wetland area in every stratum of plants (see H 1.1 for list of strata)

6 habitats selected	points = 6	
5 habitats selected	points = 5	
4 habitats selected	points = 4	
3 habitats selected	points = 3	
2 habitats selected	points = 2	
1 habitat selected	points = 1	
No habitats selected	points = 0	Score: 1

Total for H 1: 3**Rating of Site Potential**

[] 15-18 = H [] 7-14 = M [X] 0-6 = L

*Record the rating on the first page***H 2.0 Does the landscape have the potential to support habitat functions of the site?****H 2.1** What is the percentage of accessible habitat within 1km of the wetland?

>33% of 1km Polygon	points = 3	
20-33% of 1km Polygon	points = 2	
10-19% of 1km Polygon	points = 1	
<10% of 1km Polygon	points = 0	Score: 3

H 2.2 What is the percentage of total habitat in a 1km polygon around the wetland?

Total habitat is >50% of the Polygon	points = 3	
Total habitat is 10-50% of the Polygon and in 1-3 patches	points = 2	
Total habitat is 10-50% of the Polygon and in >3 patches	points = 1	
Total habitat is <10% of the Polygon	points = 0	Score: 1

Wetland name or number: B**H 2.3** What is the land use intensity in the 1km polygon?

50% of the Polygon is high intensity land use

points = -2

<50% of the Polygon is high intensity land use

points = 0

Score: 0**Total for H 2:****4****Rating of Landscape Potential**

[X] 4-6 = H [] 1-3 = M [] 0 = L

*Record the rating on the first page***H 3.0 Is the habitat provided by the site valuable to society?****H 3.1** Does the site provide habitat for species valued in laws, regulations, or policies?

- ☐ Aspen Stands
- ☐ Biodiversity Areas and Corridors
- ☐ Herbaceous Balds
- ☐ Old-growth/Mature Forests
- ☐ Oregon White Oak
- ☒ Riparian
- ☐ Westside Prairie
- ☐ Fresh Deepwater
- ☒ Instream
- ☐ Nearshore (Coastal, Open Coast, Puget Sound)
- ☐ Caves
- ☐ Cliffs
- ☒ Snags and Logs
- ☐ Talus

The following criteria automatically score 2 points:

- ☒ The wetland provides habitat for Threatened or Endangered species
- ☐ The wetland is mapped as a location for an individual WDFW priority species
- ☐ The wetland is a Wetland of High Conservation Value
- ☐ The wetland has been categorized as an important habitat site in a local plan

The wetland has 3 or more WDFW priority habitats within 100m, or meets the criteria for societal value

points = 2

The site has 1 or 2 WDFW priority habitats within 100m

points = 1

The site does not meet any of the criteria for societal value

points = 0

Score: 2**Total for H 3:****2****Rating of Value**

[X] 2 = H [] 1 = M [] 0 = L

Record the rating on the first page

Wetland name or number: B

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

SC 1.0 Estuarine Wetlands

SC 1.1 Does the wetland meet all of the following criteria for Estuarine wetlands?

- ☐ The dominant water regime is tidal
- ☐ The wetland is vegetated
- ☐ The water salinity is greater than 0.5 ppt

Yes - Go to SC 1.2

No - Not an Estuarine Wetland

**Result: Not an
Estuarine Wetland**

SC 1.2 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 Estuarine Wetland

No - Go to SC 1.3

Result:

SC 1.3 Is the wetland unit at least 1ac 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.
- ☐ At least 75% of the landward edge of the wetland has a 100ft buffer of shrub, forest, or un-grazed or un-mowed grassland
- ☐ The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.

Yes - Category I Estuarine Wetland

No - Category II Estuarine Wetland

Result:

SC 2.0 Wetlands of High Conservation Value

SC 2.1 Does the wetland overlap with any known or historical rare plant or rare & high-quality ecosystem polygons on the WNHP Data Explorer?

Yes - Category I Wetland of High Conservation Value

No - Go to SC 2.2

Result: Go to SC 2.2

SC 2.2 Does the wetland have a rare plant species, rare plant community, or high-quality common plant community that may qualify the site as a WHCV?

Yes - Category I Wetland of High Conservation Value

No - Not a Wetland of High Conservation Value

Result:

Wetland name or number: B**SC 3.0 Bogs**

SC 3.1 Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16in or more of the first 32in of the soil profile?

Yes - Go to SC 3.3

No - Go to SC 3.2

Result: 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 - Not a Bog Wetland

Result:

SC 3.3 Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least 30% cover of plant species listed in the table provided in the instructions?

Yes - Category I Bog Wetland

No - Go to SC 3.4

Result:

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 combinations of species) listed in the table found in the instructions provide more than 30% of the cover under the canopy?

Yes - Category I Bog Wetland

No - Not a Bog Wetland

Result:**SC 4.0 Forested Wetlands**

SC 4.1 Does the wetland have at least 1 contiguous acre of forest that meets one of the following criteria?

☐ Old-growth forests☐ Mature forests

Yes - Category I Forested Wetland

No - Not a Forested Wetland

Result: Not a Forested Wetland

Wetland name or number: B

SC 5.0 Wetlands in Coastal Lagoons

SC 5.1 Coastal Lagoons: Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?

- ☐ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or rocks
- ☐ The depression in which the wetland is located contains ponded water that is saline or brackish (>0.5 ppt) during most of the year in at least a portion of the open water area (measured near the bottom)
- ☐ The lagoon retains some of its surface water at low tide during spring tides

Yes - Go to SC 5.2

No - Not a Coastal Lagoon Wetland

Result: Not a Coastal Lagoon Wetland

SC 5.2 Does the wetland meet all of the following three conditions?

- ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species).
- ☐ At least 75% of the landward edge of the wetland has a 100ft buffer of shrub, forest, or un-grazed or un-mowed grassland.
- ☐ the wetland is larger than 0.10ac (4350 sqft)

Yes - Category I Coastal Lagoon

No - Category II Coastal Lagoon

Result:

SC 6.0 Interdunal Wetlands

SC 6.1 Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership WBUO)?

Yes - Go to SC 6.2

No - Not an Interdunal Wetland

Result: Not an Interdunal Wetland

SC 6.2 Is the wetland 1ac or larger in size, or a mosaic that is 1ac or larger in size?

Wetland is larger than 1ac in size - Go to SC 6.3

Wetland is a mosaic larger than 1ac is size - Category II Interdunal Wetland

No - Go to SC 6.4

Result:

SC 6.3 Does the wetland score 8 or 9 points for the habitat functions?

Yes - Category I Interdunal Wetland

No - Category II Interdunal Wetland

Result:

SC 6.4 Is the wetland unit between 0.1ac and 1ac, or in a mosaic of wetlands that is between 0.1ac and 1ac in size?

Yes - Category III Interdunal Wetland

No - Category IV Interdunal Wetland

Result:

Wetland name or number: B

Category of wetland based on Special Characteristics

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

Special Characteristics
Category: Not
Applicable

Wetland B

Figure B1 – Cowardin Plant Classes

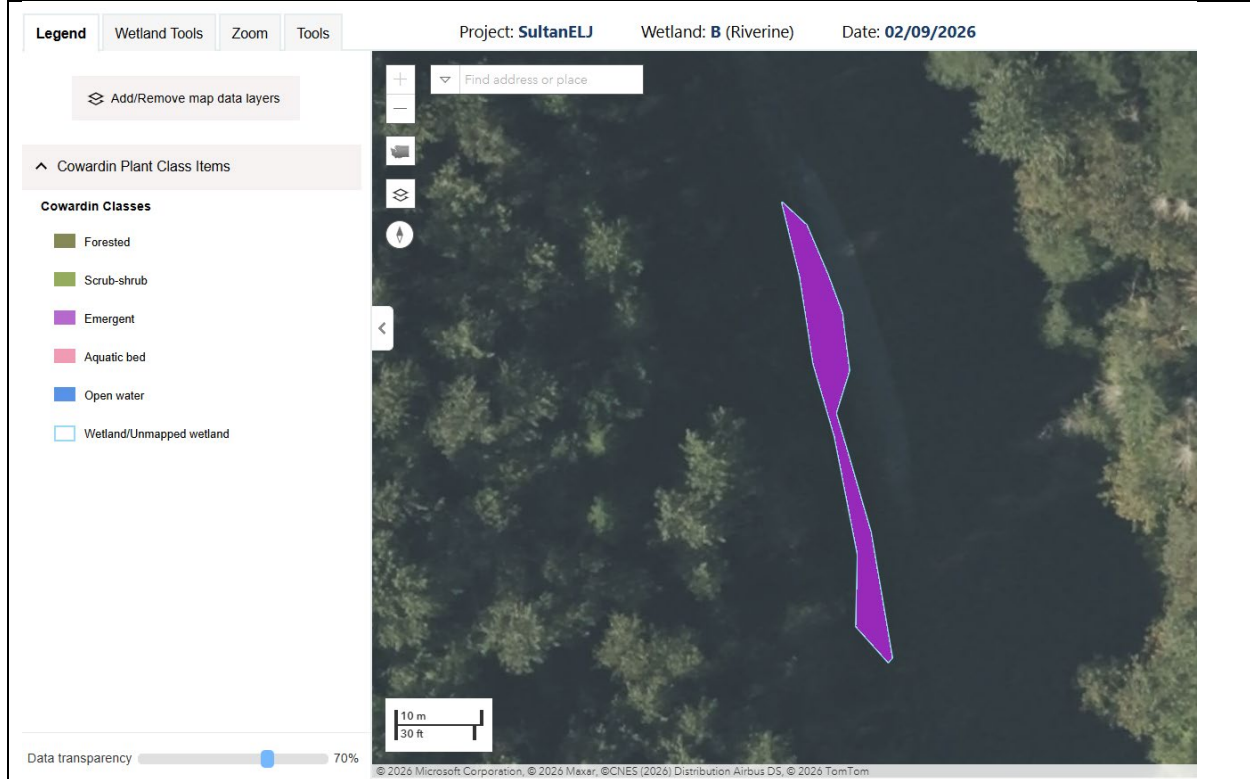
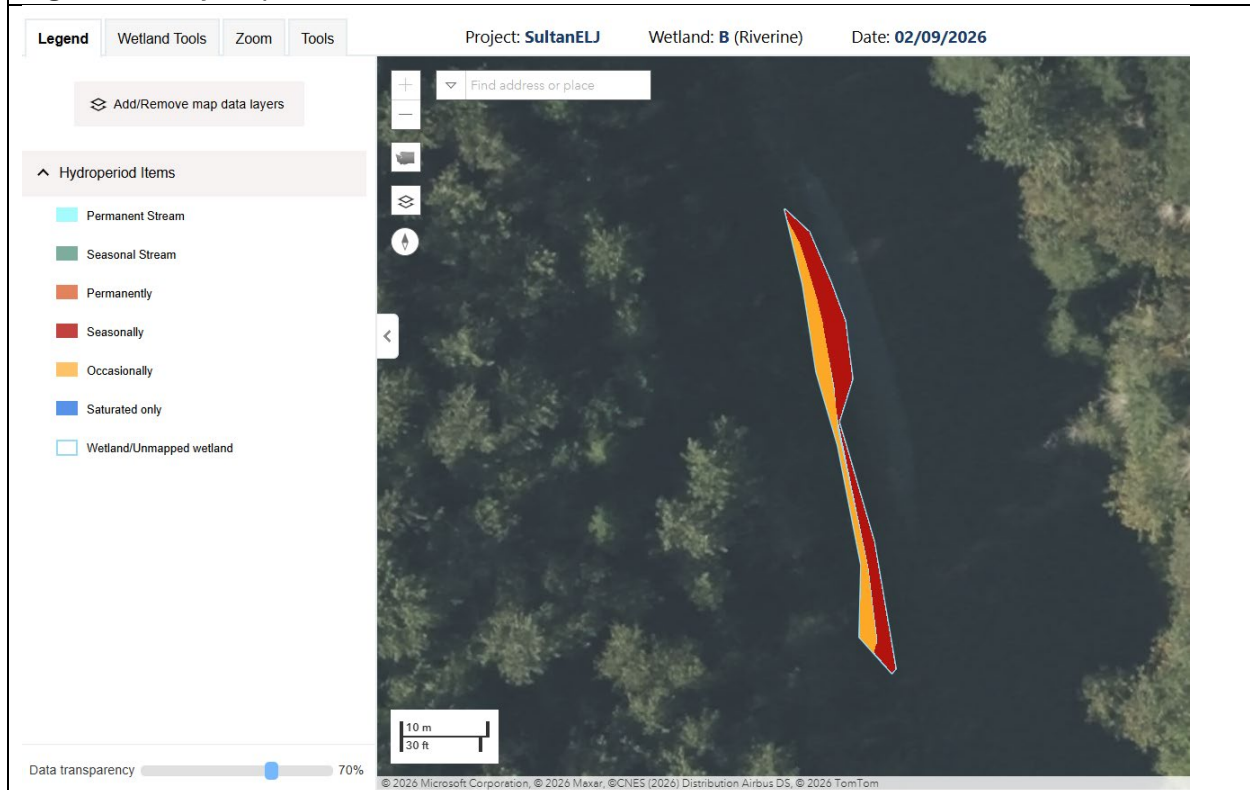


Figure B2 – Hydroperiods



Wetland B

Figure B3 – Ponded Depressions

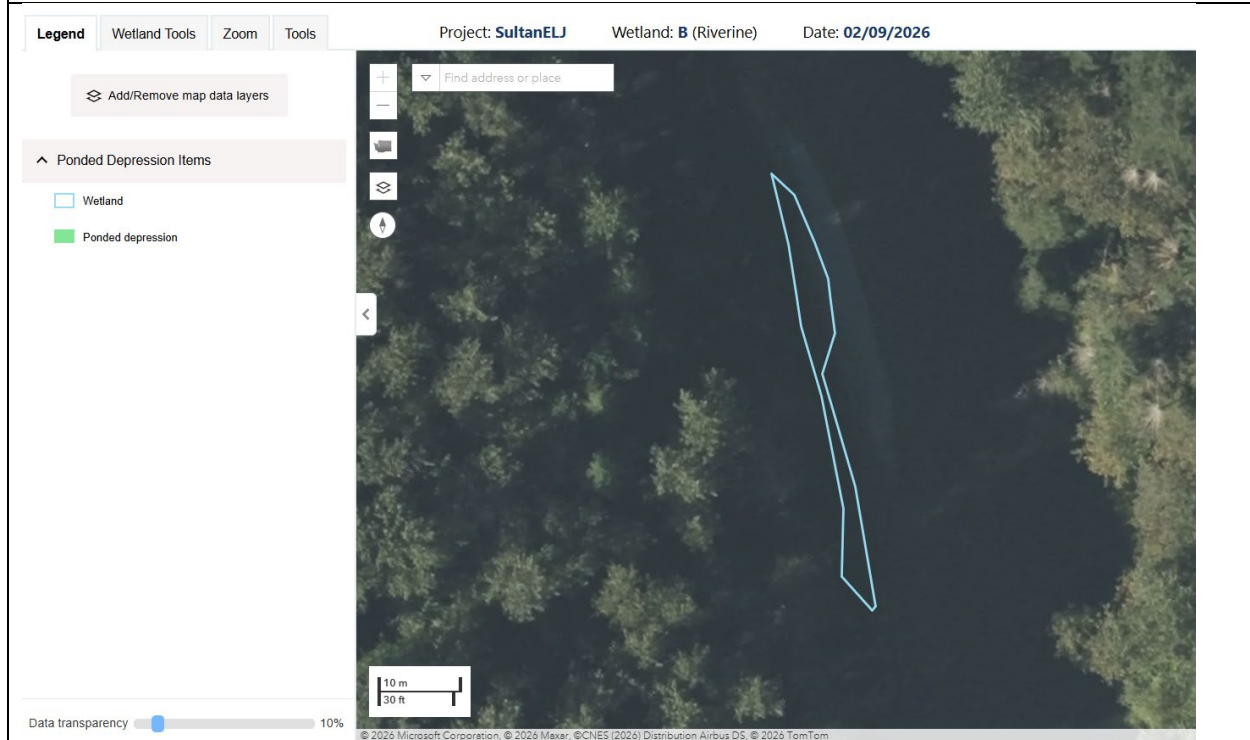
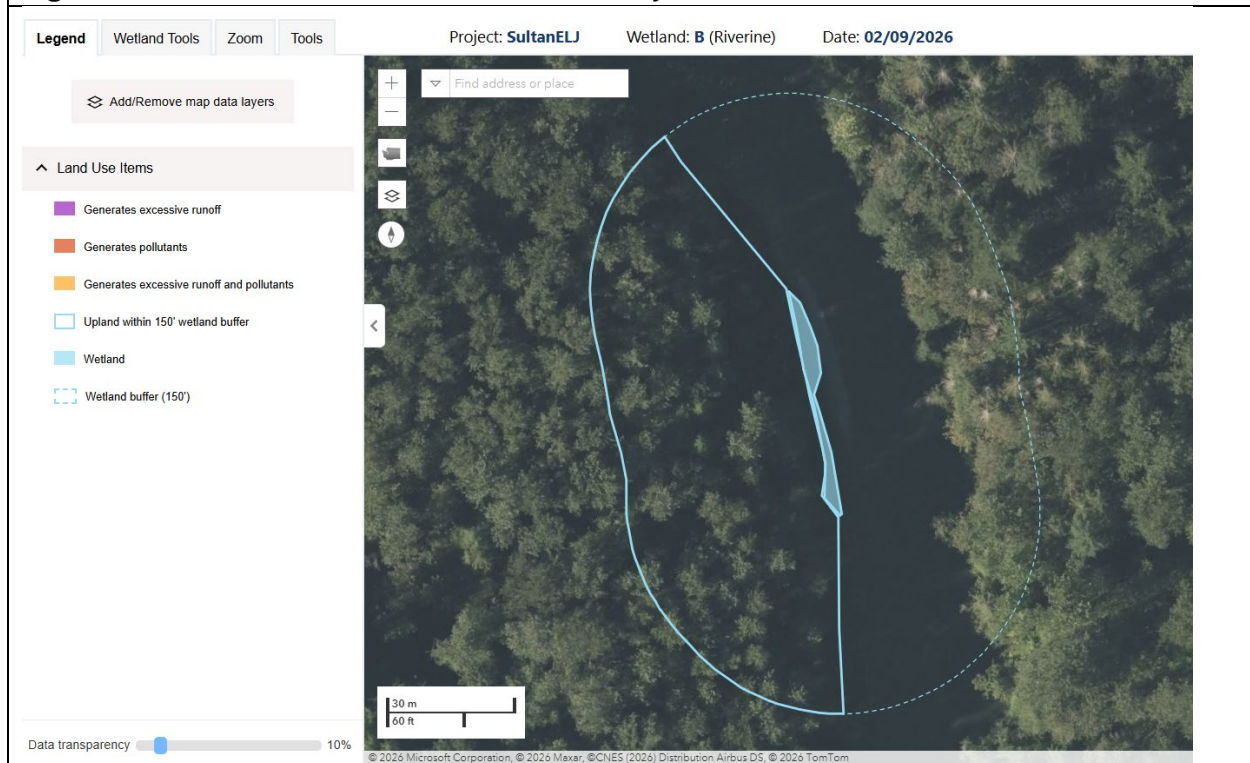


Figure B4 – Land Use Within 150-foot Boundary



Wetland B

Figure B5 – Plant Cover of Trees, Shrubs, and Herbaceous Plants

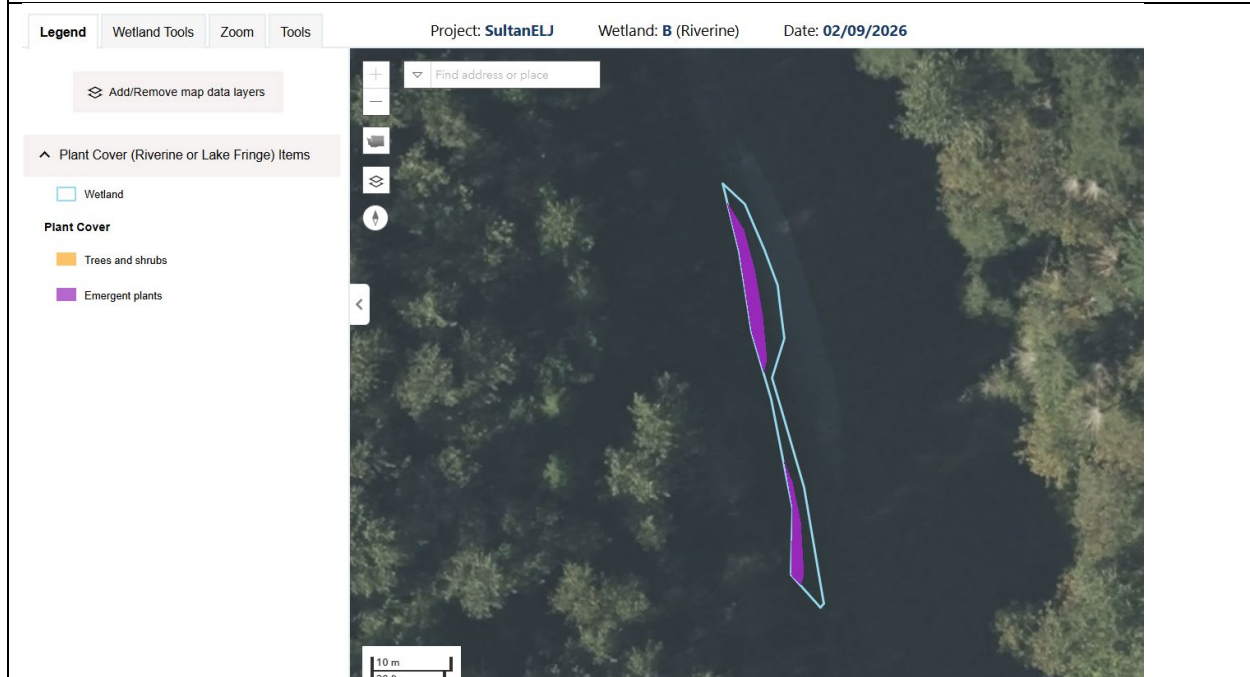
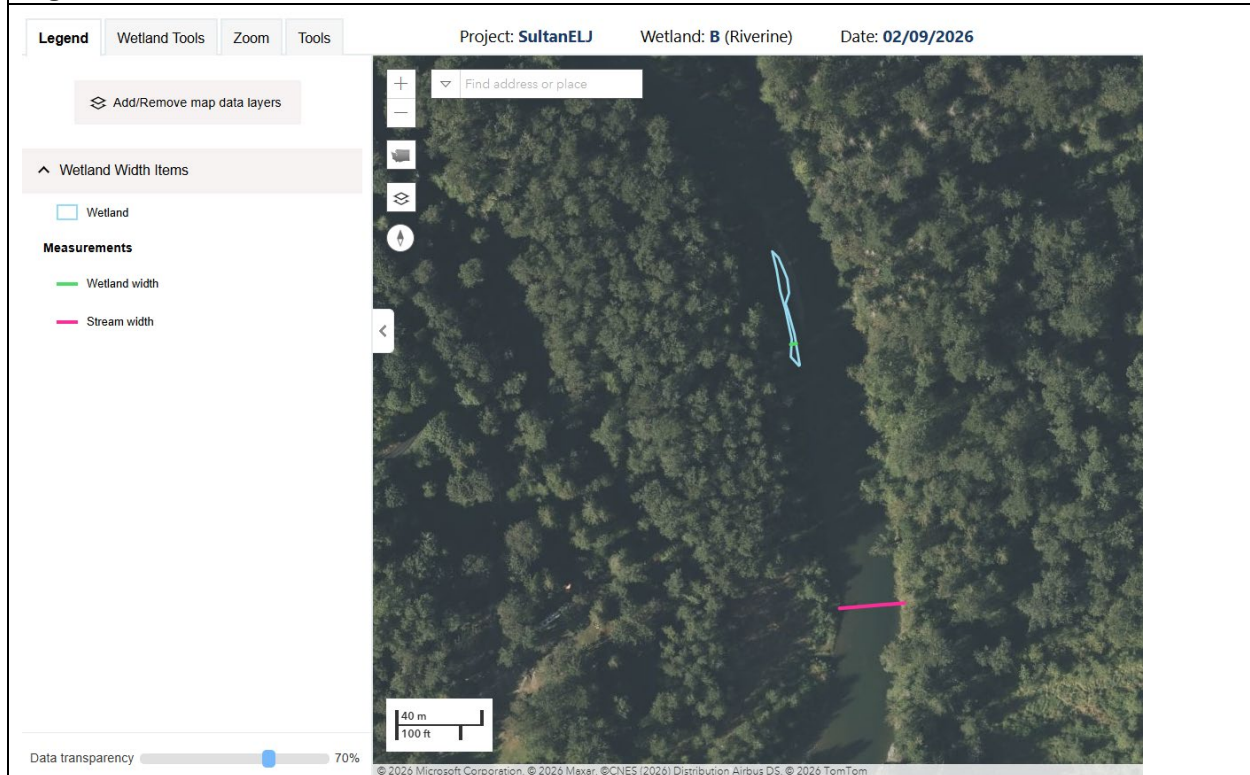


Figure B6 – Width of Unit vs. Width of Stream



Wetland B

Figure B7 – Map of Contributing Basin

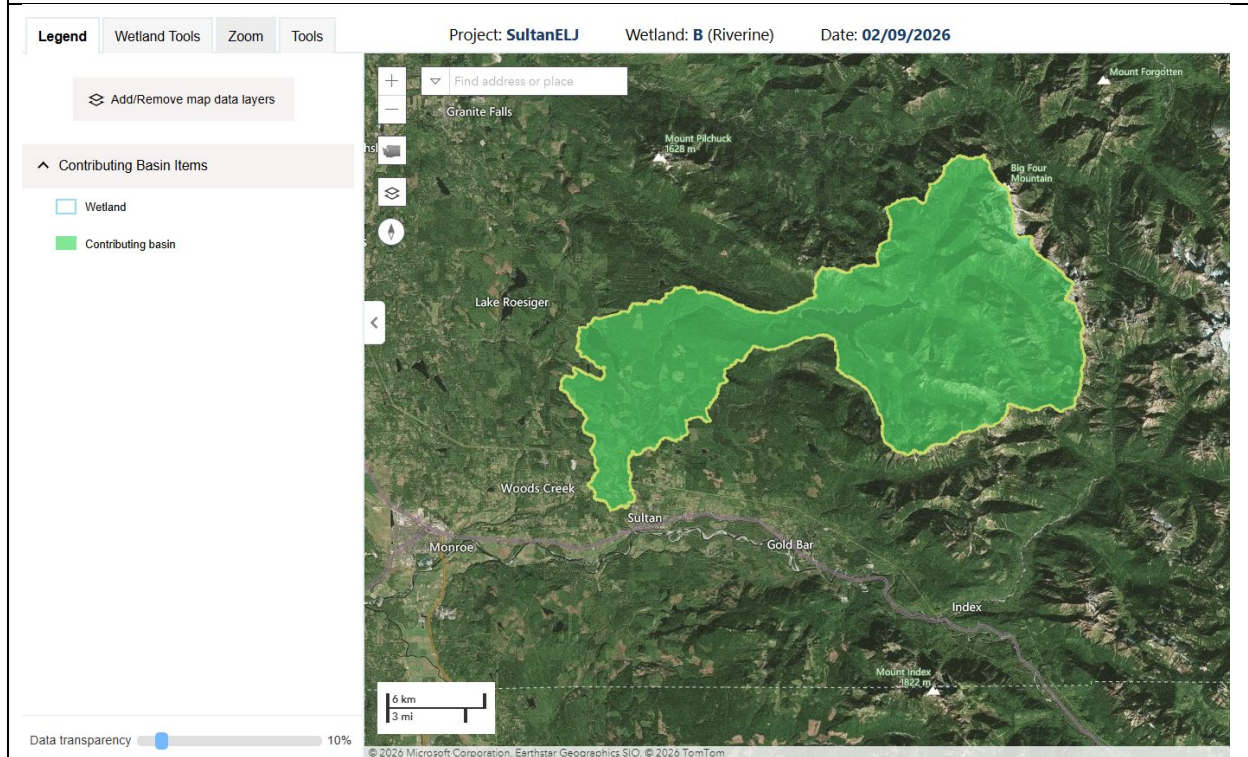
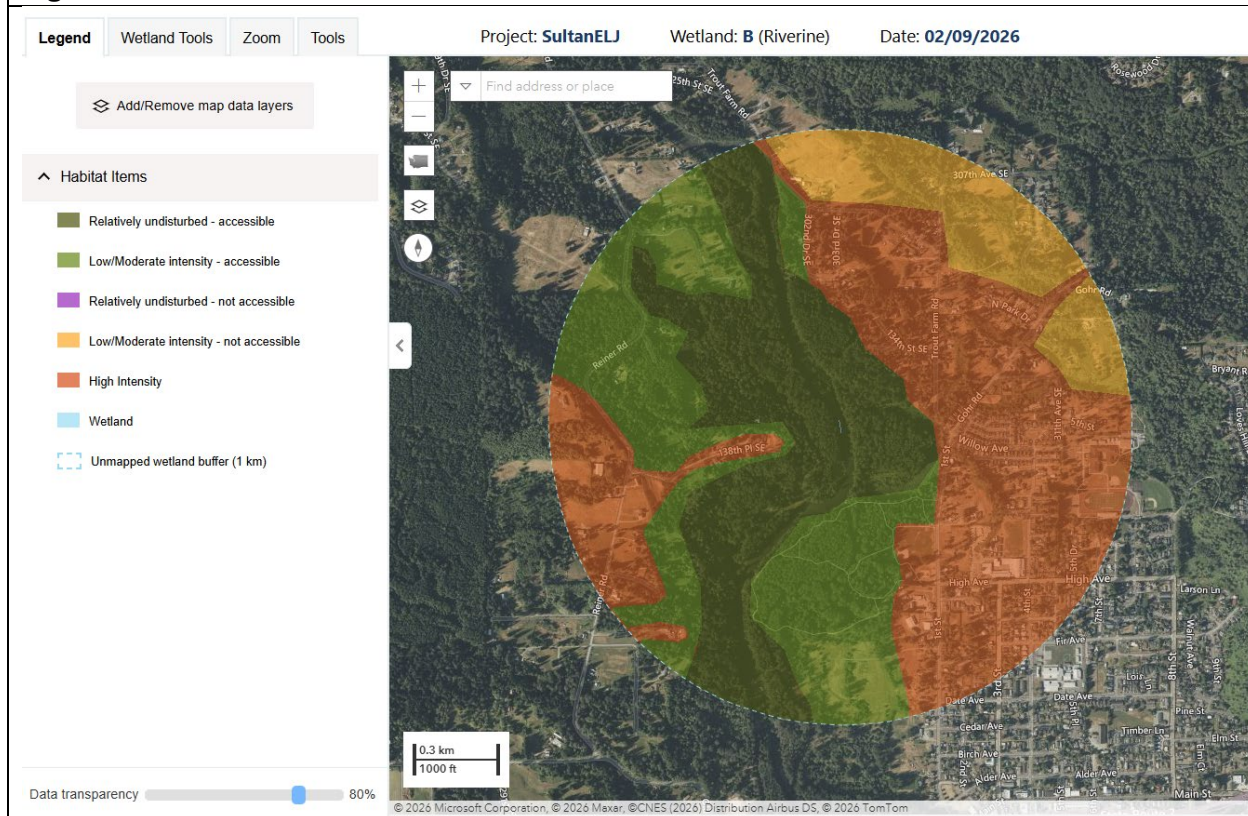


Figure B8 – Habitat within 1 km



Wetland B

Figure B9 – 303(d) Waters in Basin

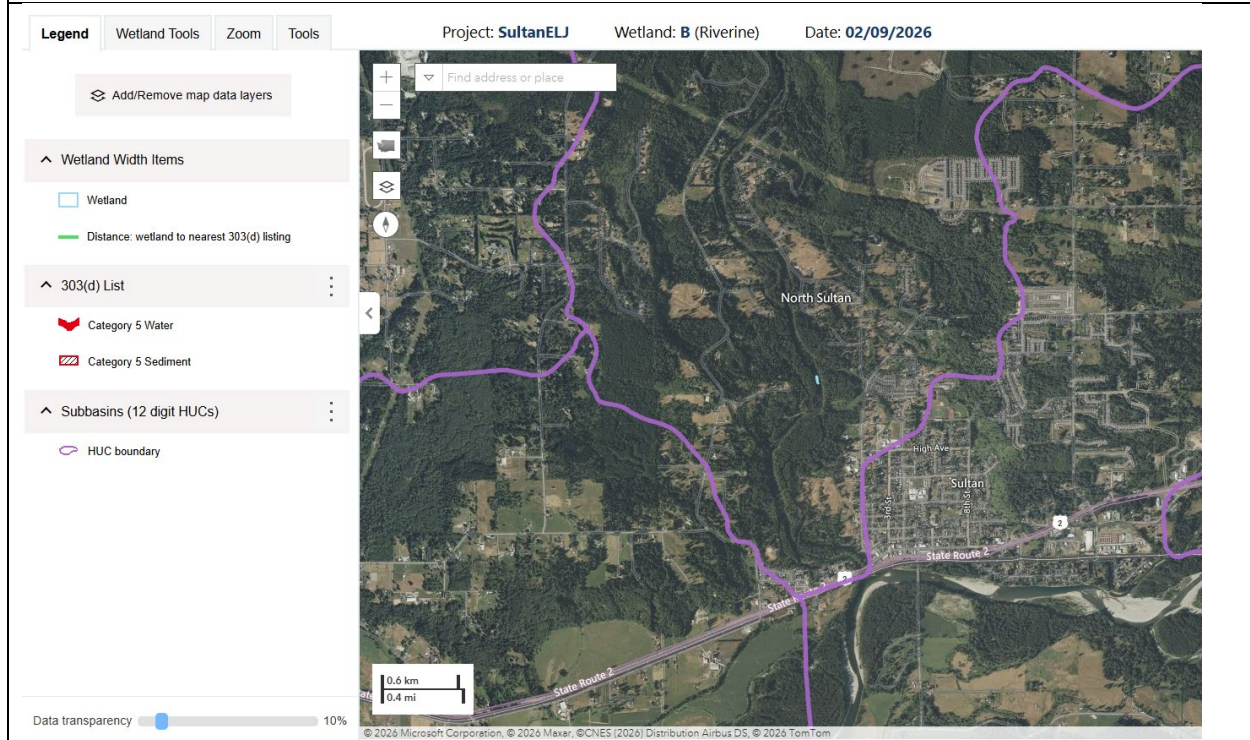
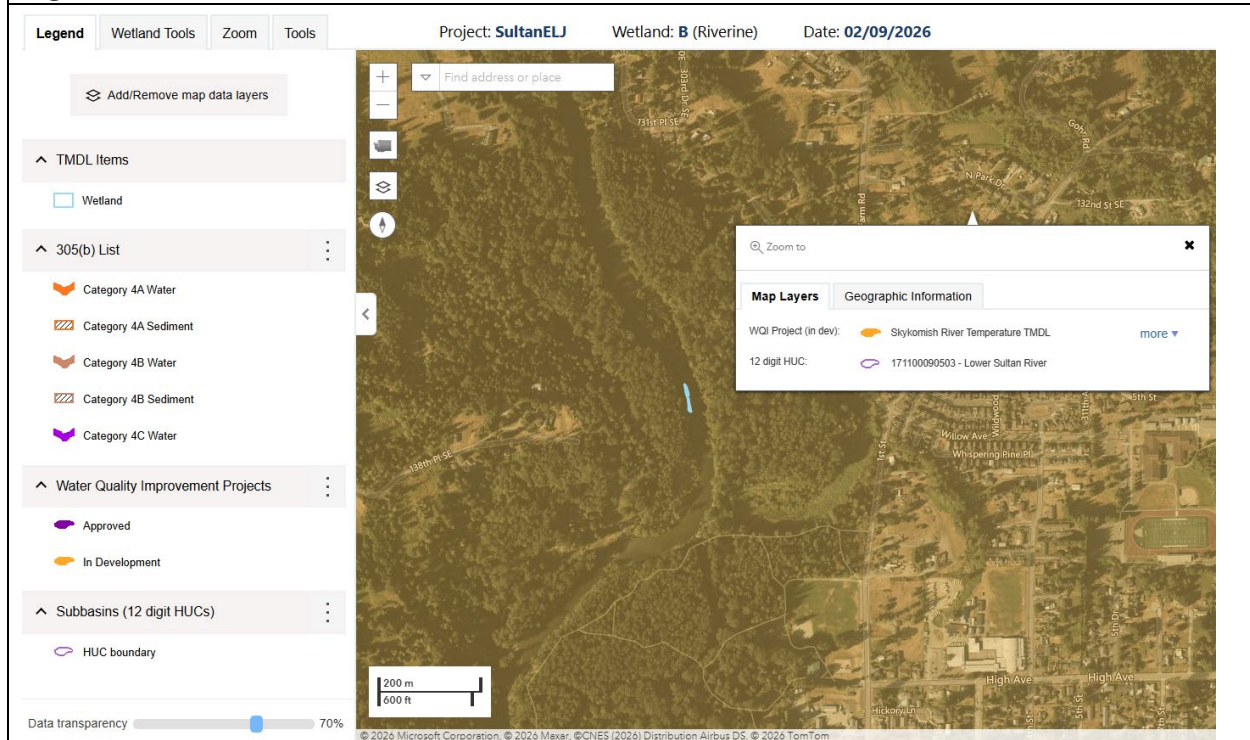
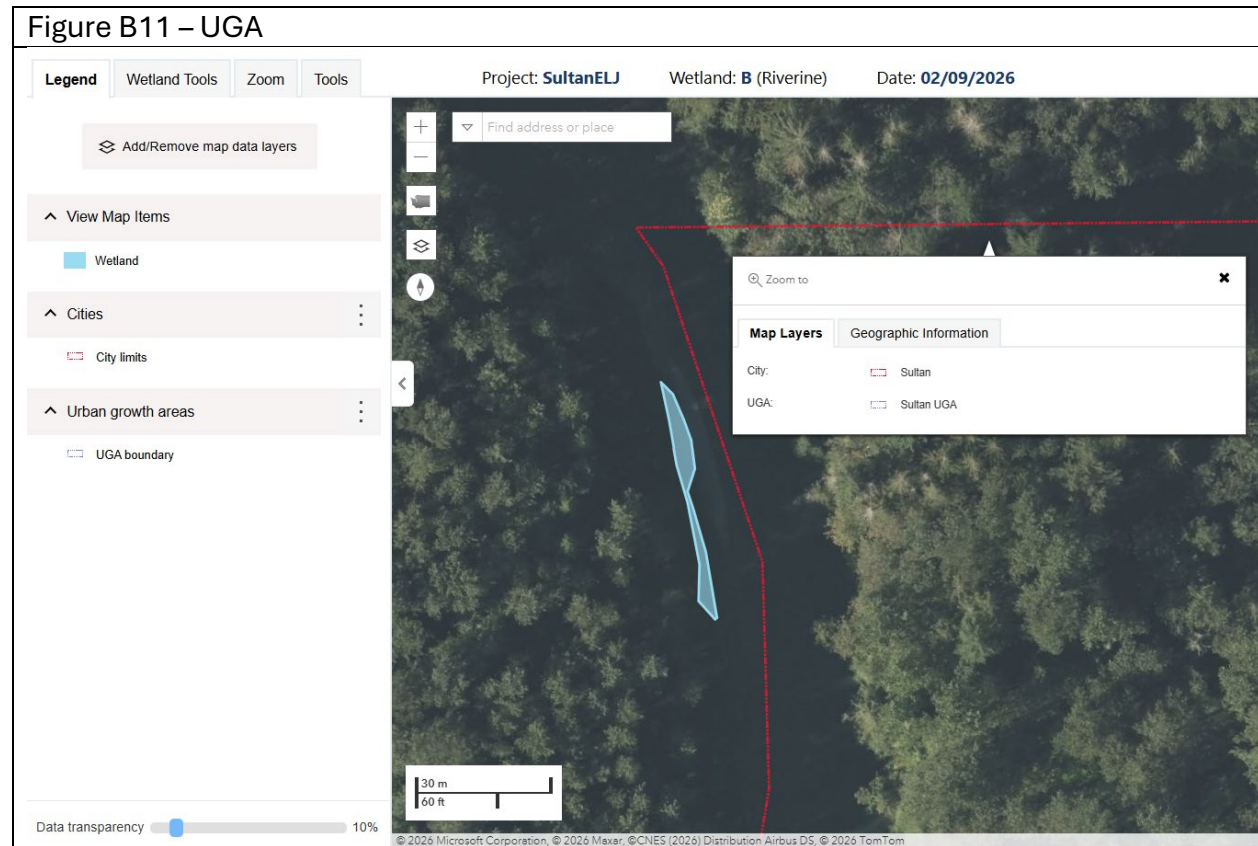


Figure B10 – TMDLs for WRIA



Wetland B

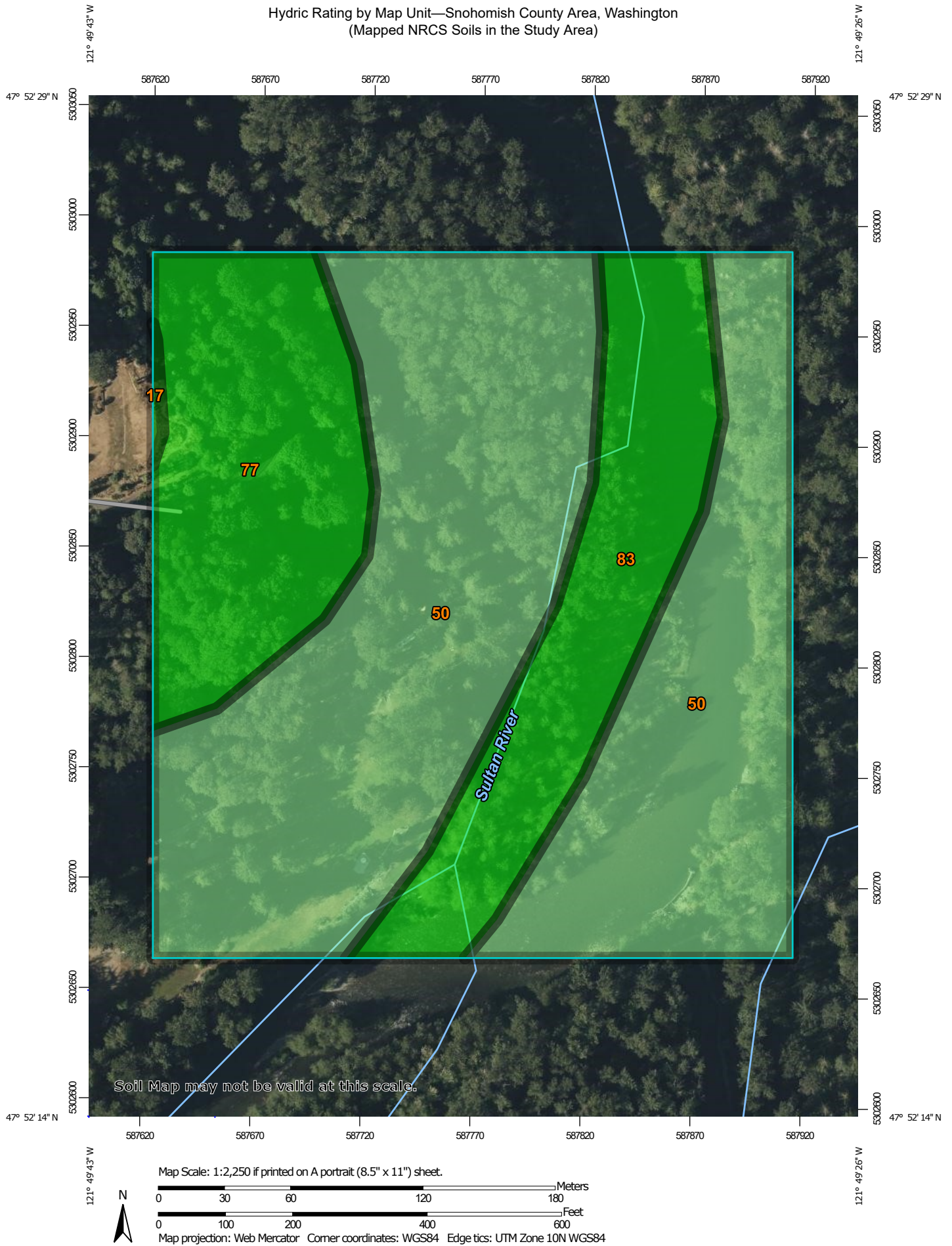


While the Sultan UGA is technically within this HUC-12, landscape drainage patterns cause water from the upgradient Sultan UGA to discharge downstream from the wetland. As a result, this negates the wetlands' potential for water quality improvement.

Appendix D

Natural Resources Conservation Service Soil Report

Hydric Rating by Map Unit—Snohomish County Area, Washington (Mapped NRCS Soils in the Study Area)



Hydric Rating by Map Unit—Snohomish County Area, Washington
(Mapped NRCS Soils in the Study Area)

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

Soil Rating Polygons

-  Hydric (100%)
-  Hydric (66 to 99%)
-  Hydric (33 to 65%)
-  Hydric (1 to 32%)
-  Not Hydric (0%)
-  Not rated or not available

Soil Rating Lines

-  Hydric (100%)
-  Hydric (66 to 99%)
-  Hydric (33 to 65%)
-  Hydric (1 to 32%)
-  Not Hydric (0%)
-  Not rated or not available

Soil Rating Points

-  Hydric (100%)
-  Hydric (66 to 99%)
-  Hydric (33 to 65%)
-  Hydric (1 to 32%)
-  Not Hydric (0%)
-  Not rated or not available

Water Features

 Streams and Canals

Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

Background

-  Aerial Photography

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:
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: Snohomish County Area, Washington
Survey Area Data: Version 27, Aug 28, 2025

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

Date(s) aerial images were photographed: Aug 6, 2022—Sep 8, 2022

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.

Hydric Rating by Map Unit

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
17	Everett very gravelly sandy loam, 0 to 8 percent slopes	0	0.0	0.2%
50	Pilchuck loamy sand	5	14.6	63.2%
77	Tokul-Winston gravelly loams, 25 to 65 percent slopes	0	4.3	18.7%
83	Water	0	4.1	17.9%
Totals for Area of Interest			23.1	100.0%

Description

This rating indicates the percentage of map units that meets the criteria for hydric soils. Map units are composed of one or more map unit components or soil types, each of which is rated as hydric soil or not hydric. Map units that are made up dominantly of hydric soils may have small areas of minor nonhydric components in the higher positions on the landform, and map units that are made up dominantly of nonhydric soils may have small areas of minor hydric components in the lower positions on the landform. Each map unit is rated based on its respective components and the percentage of each component within the map unit.

The thematic map is color coded based on the composition of hydric components. The five color classes are separated as 100 percent hydric components, 66 to 99 percent hydric components, 33 to 65 percent hydric components, 1 to 32 percent hydric components, and less than one percent hydric components.

In Web Soil Survey, the Summary by Map Unit table that is displayed below the map pane contains a column named 'Rating'. In this column the percentage of each map unit that is classified as hydric is displayed.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). Under natural conditions, these soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

References:

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.

Rating Options

Aggregation Method: Percent Present

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

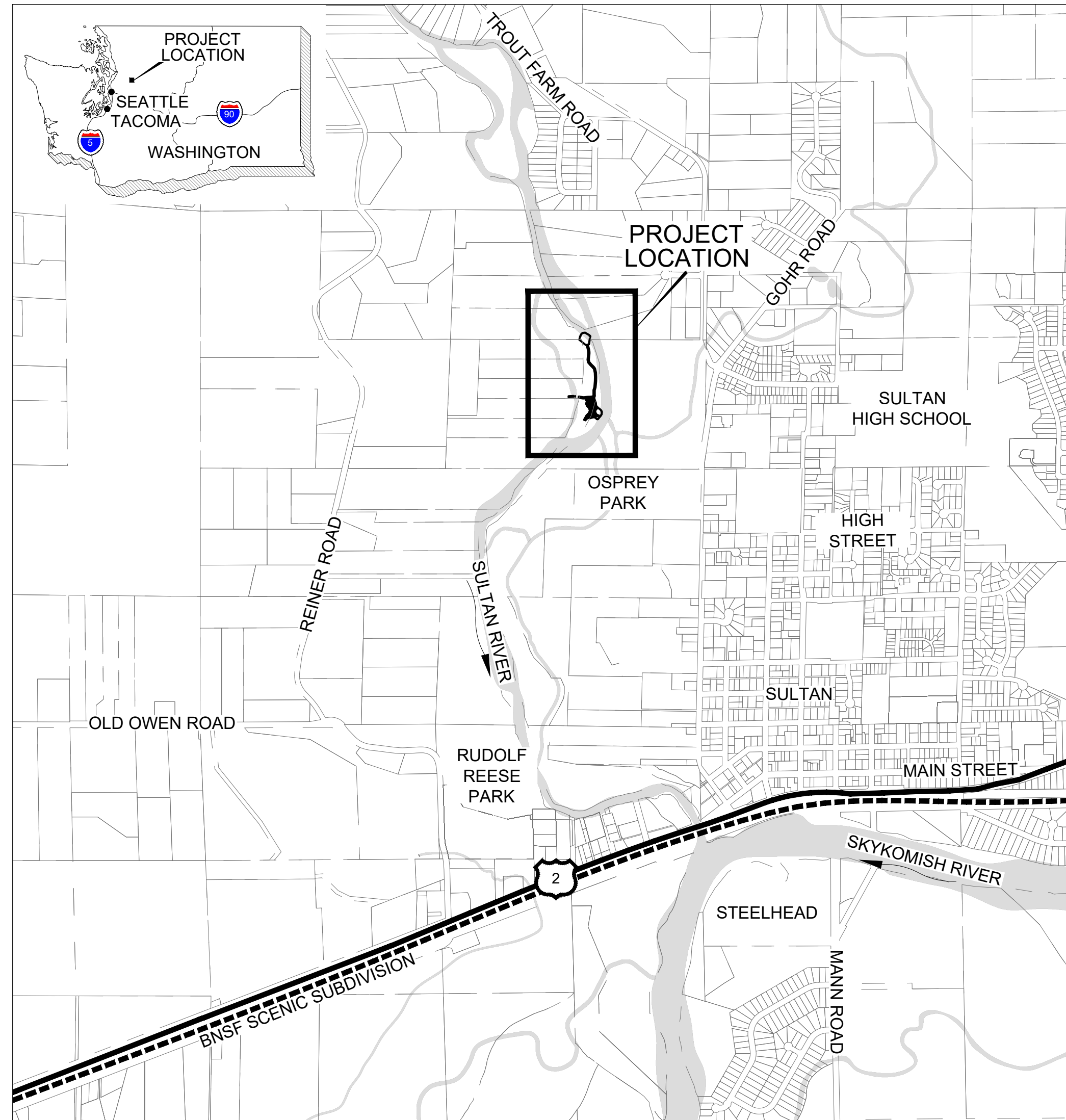
Appendix E

60% Site Plans

SULTAN RIVER

ENGINEERED LOG JAM 9 & 10 PROJECT

PERMIT LEVEL DESIGN



VICINITY MAP

Sheet List Table

Sheet Number	Sheet Title
01	COVER SHEET
02	EXISTING SITE PLAN
03	PROPOSED SITE PLAN
04	TEMPORARY WETLAND AND BUFFER IMPACTS
05	WETLAND AND BUFFER RESTORATION AREAS
06	ELJ 9
07	ELJ 9 LAYERING PLAN
08	ELJ 10
09	ELJ 10 LAYERING PLAN
10	LAYERING DETAILS
11	PLANTING SCHEDULE, NOTES AND DETAILS

DISTRICT PROJECT LEAD:

SNOHOMISH COUNTY PUD NO. 1
KYLE LEGARE
P.O. BOX 1107
EVERETT, WA 98206-1107

(425) 783-1841
KJLEGARE@SNOPUD.COM

ENGINEER:

SHANNON & WILSON
GUS KAYS, P.E.
400 N 34TH ST
SEATTLE, WA 98103

(206) 695-6941
GUS.KAYS@SHANWIL.COM

REFERENCE NO:

APPLICANT:

ADJACENT PROPERTY OWNERS:

SNOHOMISH COUNTY PUD #1

SEE JARPA 5H

LOCATION:

LAT/LONG:

DATE:
SHEET:

NEAR 138TH PLACE SE

47.8730 N / -121.8254 W

JUNE 2026
01 OF 11

PROPOSED PROJECT:

IN:

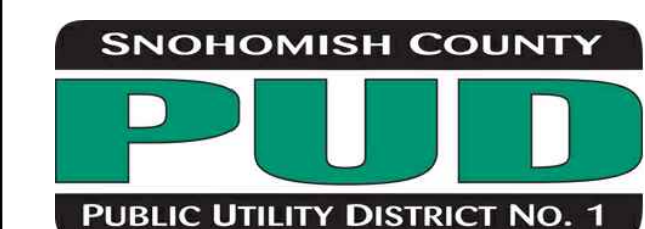
NEAR:
COUNTY:
STATE:

CONSTRUCT 2 ELJS

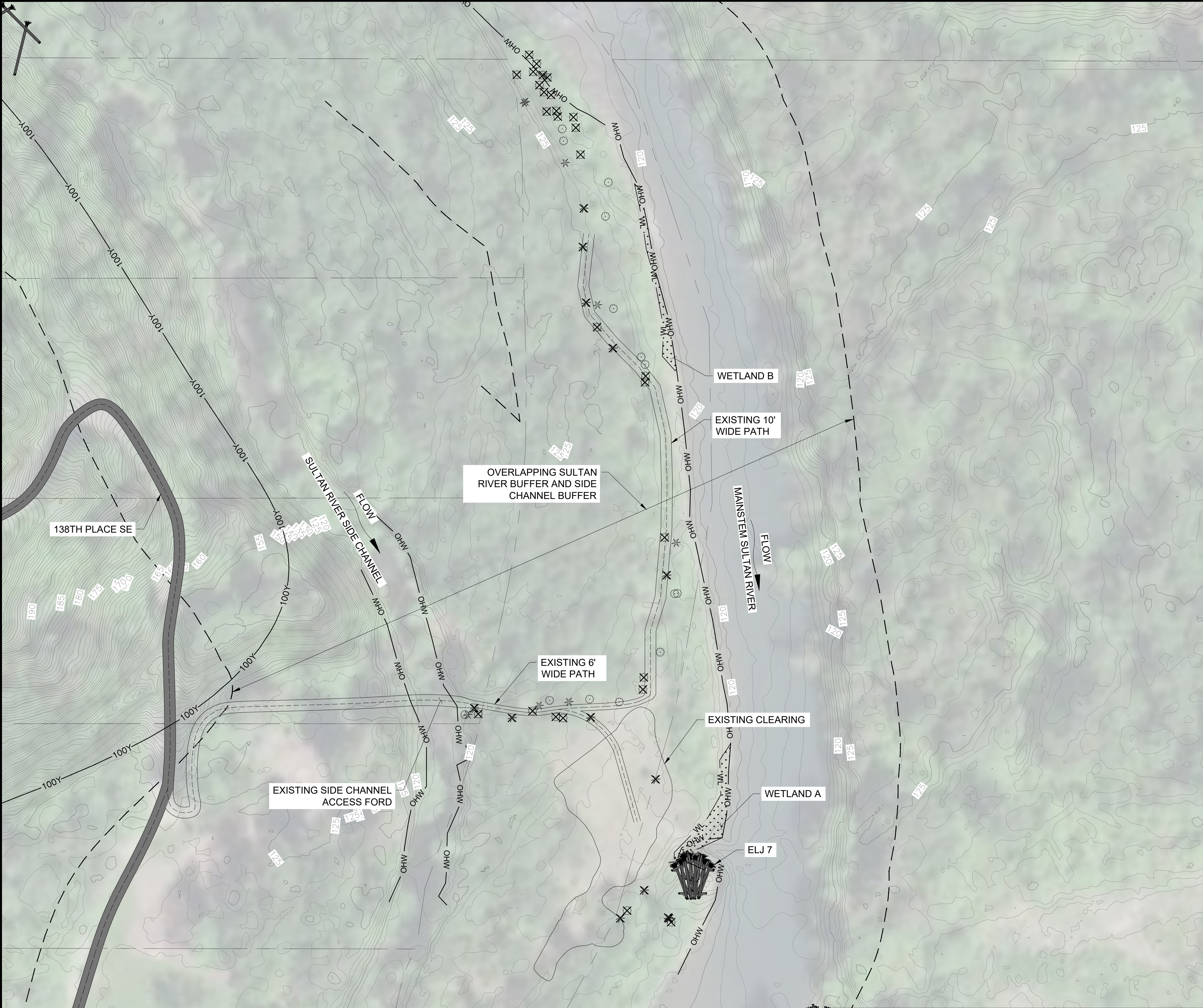
SULTAN RIVER, SULTAN RIVER SIDE
CHANNEL 2, WETLAND A

SULTAN
SNOHOMISH
WASHINGTON

SHANNON & WILSON



SNOHOMISH PUBLIC UTILITIES DISTRICT NO. 1
ATTN: MANAGER OF NATURAL RESOURCES
P.O. BOX 1107, EVERETT, WA 98201
PHONE: 425-783-1841



GENERAL NOTES:

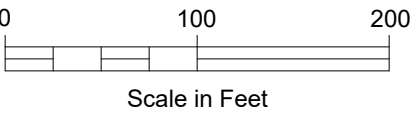
1. CONTOURS ARE DERIVED FROM LIDAR AND DO NOT REFLECT BELOW WATER ELEVATIONS.
2. WETLANDS AND OHW LINES PROVIDED BY HERRERA INC.
3. ALL UPLANDS AND WETLANDS WITHIN THE 100-YEAR FLOODPLAIN ARE DESIGNATED AS RURAL CONSERVANCY SHORELINE.
4. TREE LOCATIONS ARE APPROXIMATE.

LEGEND:

	EXISTING CONTOURS
	PARCEL BOUNDARY
	PROPOSED CONSTRUCTION ACCESS ROAD
	EXISTING ROAD
	EXISTING DRIVEWAY
	WETLAND BOUNDARY
	ORDINARY HIGH WATER
	150' STREAM BUFFER
	FEMA 100-YEAR FLOODPLAIN
	SILT FENCE
	CONIFER TREE
	DECIDUOUS TREE
	CONIFER TREE TO BE REMOVED
	DECIDUOUS TREE TO BE REMOVED

TREE REMOVAL INVENTORY:

TYPE	TREE SIZE			
	< 9"	9 - 15"	15 - 21"	> 21"
DECIDUOUS	14	10	0	0
CONIFER	9	4	2	1



SHANNON & WILSON



SNOHOMISH PUBLIC UTILITIES DISTRICT NO. 1
ATTN: MANAGER OF NATURAL RESOURCES
P.O. BOX 1107, EVERETT, WA 98201
PHONE: 425-783-1841

EXISTING SITE PLAN

C-02

REFERENCE NO:
APPLICANT:
PROPOSED PROJECT:
LOCATION:

SNOHOMISH COUNTY PUD #1
CONSTRUCT 2 ELJS
NEAR 138TH PLACE SE

SHEET: 02 OF 11 DATE: JUNE 2026



GENERAL NOTES:

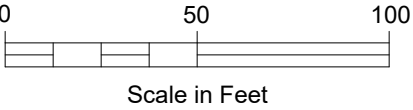
- 1. ACCESS TO ELJ 9 TO FOLLOW EXISTING PRIMITIVE ACCESS ROUTE.
- 2. ACCESS CORRIDOR TO ELJ 10 IS APPROXIMATE AND SHALL BE ALIGNED TO MINIMIZE TREE AND BUFFER DISTURBANCE. WHERE POSSIBLE ACCESS SHALL BE ALIGNED ALONG COBBLE BAR BANKS.
- 3. ACCESS ROUTE SHALL BE MARKED IN THE FIELD PRIOR TO GROUND DISTURBANCE.
- 4. CONTOURS ARE DERIVED FROM LIDAR AND DO NOT REFLECT BELOW WATER ELEVATIONS.
- 5. TEMPORARY BRIDGE SHALL SPAN THE WETTED WIDTH FOR THE CONSTRUCTION PERIOD. REVIEW FORECASTS AND REMOVE TEMPORARY BRIDGE / BULK BAGS IF HIGH FLOWS THAT WOULD INUNDATE OR DAMAGE THESE FACILITIES ARE ANTICIPATED WITHIN 48 HOURS. ANY MODIFICATIONS TO THE BANK SHALL BE OUTSIDE OF THE WETTED WIDTH AND RESTORED TO MATCH THE EXISTING SIDE CHANNEL FORD. IF TEMPORARY BRIDGE INSTALLATION REQUIRES GRADING OF THE EXISTING FORD, SILT FENCE OR STRAW WATTLES SHALL BE INSTALLED TO PROTECT WATER QUALITY.

LEGEND:

- EXISTING CONTOURS
- PARCEL BOUNDARY
- PROPOSED CONSTRUCTION ACCESS ROAD
- EXISTING ROAD
- EXISTING DRIVEWAY
- STAGING AREA
- WETLAND BOUNDARY
- ORDINARY HIGH WATER
- SILT FENCE
- HIGH VISIBILITY FENCE
- 150' STREAM BUFFER
- FEMA 100-YEAR FLOODPLAIN
- BULK BAG ISOLATION DAM
- CONIFER TREE
- DECIDUOUS TREE
- CONIFER TREE TO BE REMOVED
- DECIDUOUS TREE TO BE REMOVED

CUT AND FILL VOLUME:

	WETLAND A	RIVER	BUFFER	
CUT	0	1453	127	CY
TEMPORARY FILL (BULK BAGS AND ECOLOGY BLOCKS)	5	216	5	CY
PERMANENT FILL (BACKFILL AND LWM)	0	458	93	CY



SHANNON & WILSON



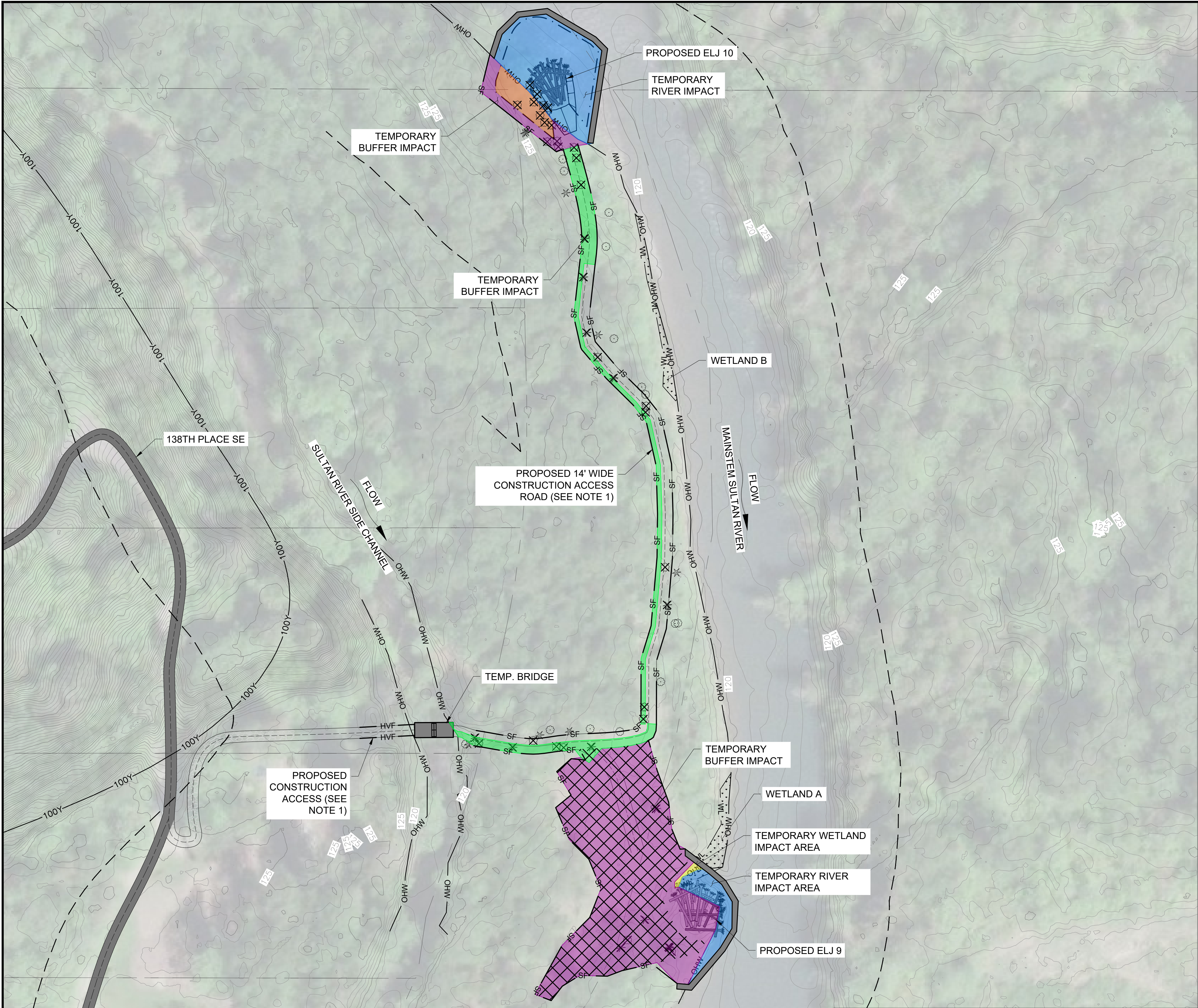
SNOHOMISH PUBLIC UTILITIES DISTRICT NO. 1
ATTN: MANAGER OF NATURAL RESOURCES
P.O. BOX 1107, EVERETT, WA 98201
PHONE: 425-783-1841

PROPOSED SITE PLAN

C-03

REFERENCE NO:
APPLICANT: SNOHOMISH COUNTY PUD #1
PROPOSED PROJECT: CONSTRUCT 2 ELJS
LOCATION: NEAR 138TH PLACE SE

SHEET: 03 OF 11 DATE: JUNE 2026

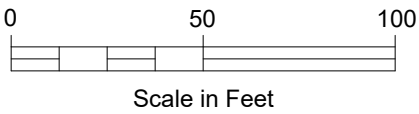


GENERAL NOTES:

1. ACCESS TO ELJ 9 TO FOLLOW EXISTING PRIMITIVE ACCESS ROUTE. EXISTING ROUTE TO BE WIDENED TO 14' FOR CONSTRUCTION DURATION AND RESTORED TO 10' WIDTH POST CONSTRUCTION OF ELJ 9.
2. ACCESS TO ELJ 10 SHALL MINIMIZE DISTURBANCE AND TREE REMOVAL. WHERE POSSIBLE ACCESS SHALL BE ALIGNED ALONG COBBLE BAR BANKS.
3. ACCESS ROUTE SHALL BE MARKED IN THE FIELD PRIOR TO GROUND DISTURBANCE.
4. CONTOURS ARE DERIVED FROM LIDAR AND DO NOT REFLECT BELOW WATER ELEVATIONS.
5. REVIEW FORECASTS AND REMOVE TEMPORARY BRIDGE / BULK BAGS IF HIGH FLOWS ARE ANTICIPATED WITHIN 48 HOURS. ANY MODIFICATIONS TO THE BANK SHALL BE RESTORED.

LEGEND:

	EXISTING CONTOURS
	PARCEL BOUNDARY
	PROPOSED CONSTRUCTION ACCESS ROAD
	EXISTING ROAD
	EXISTING DRIVEWAY
	STAGING AREA
	WETLAND BOUNDARY
	ORDINARY HIGH WATER
	SILT FENCE
	HIGH VISIBILITY FENCE
	150' STREAM BUFFER
	FEMA 100-YEAR FLOODPLAIN
	BULK BAG ISOLATION DAM
	TEMPORARY RIVER IMPACT
	TEMPORARY BUFFER IMPACT
	TEMPORARY BUFFER IMPACT (ROAD)
	TEMPORARY WETLAND IMPACT
	BUFFER TO RIVER CONVERSION
	CONIFER TREE
	DECIDUOUS TREE
	CONIFER TREE TO BE REMOVED
	DECIDUOUS TREE TO BE REMOVED



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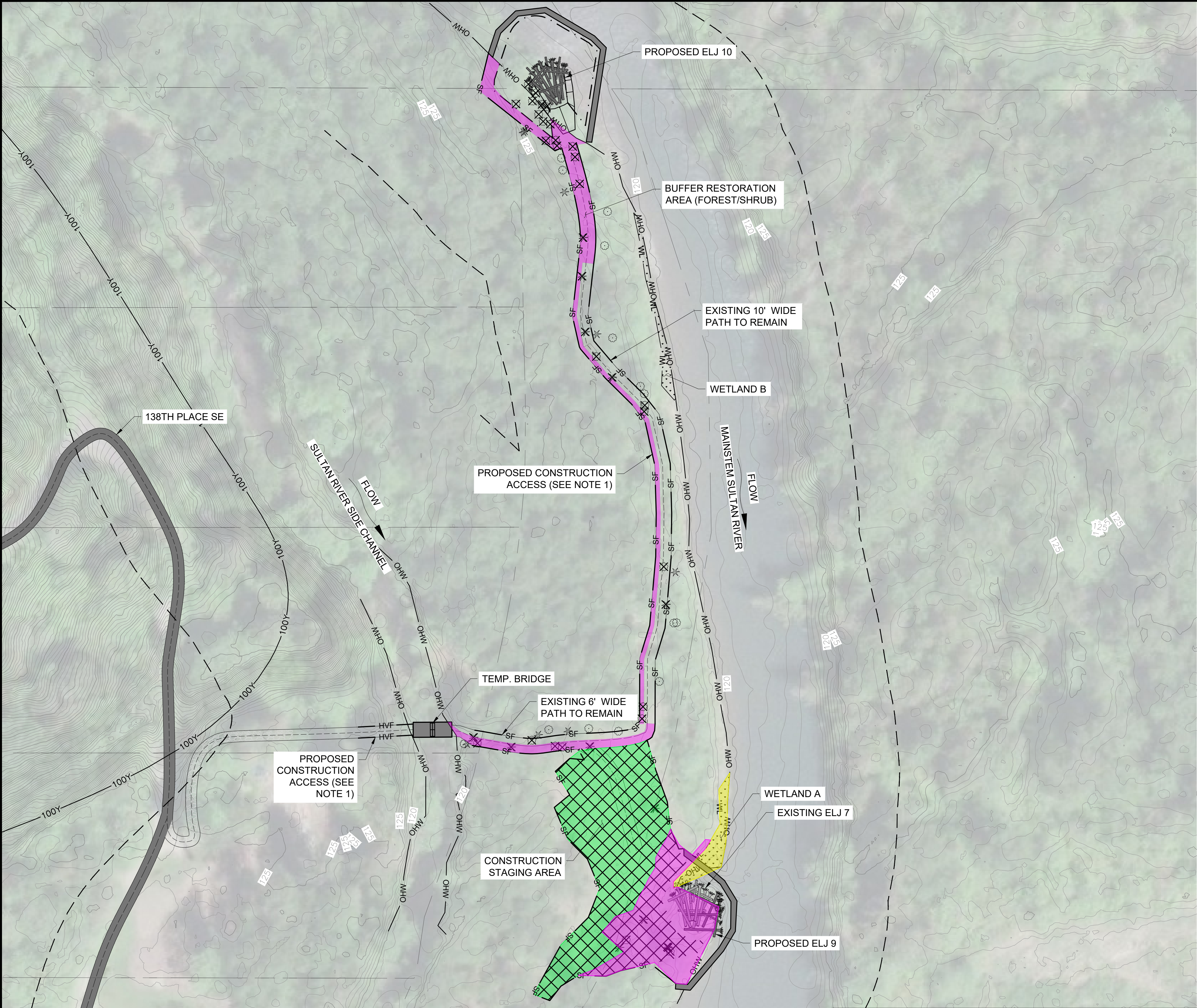


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TEMPORARY WETLAND AND BUFFER IMPACTS C-04

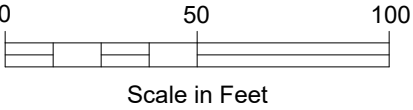
REFERENCE NO:
APPLICANT: SNOHOMISH COUNTY PUD #1
PROPOSED PROJECT: CONSTRUCT 2 ELJS
LOCATION: NEAR 138TH PLACE SE

SHEET: 04 OF 11 DATE: JUNE 2026



- GENERAL NOTES:**
1. ACCESS TO ELJ 9 TO GENERALLY FOLLOW EXISTING PRIMITIVE ACCESS ROUTE EXCEPT WHERE REALIGNMENT RESULTS IN REDUCED CLEARING.
 2. ACCESS TO ELJ 10 SHALL MINIMIZE DISTURBANCE AND TREE REMOVAL. WHERE POSSIBLE ACCESS SHALL BE ALIGNED ALONG COBBLE BAR BANKS.
 3. AVOID DISTURBING EXISTING NATIVE VEGETATION, TO THE EXTENT FEASIBLE, DURING PLANTING. FIELD FIT PLANTINGS WITHIN THE EXISTING WETLAND AND ADJACENT BUFFER AREAS WHERE NATIVE VEGETATION IS ABSENT.

- LEGEND:**
- | | |
|--|--|
| | EXISTING CONTOURS |
| | PARCEL BOUNDARY |
| | PROPOSED CONSTRUCTION ACCESS ROAD |
| | EXISTING ROAD |
| | EXISTING DRIVEWAY |
| | STAGING AREA |
| | WETLAND BOUNDARY |
| | ORDINARY HIGH WATER |
| | SILT FENCE |
| | HIGH VISIBILITY FENCE |
| | 150' STREAM BUFFER |
| | FEMA 100-YEAR FLOODPLAIN |
| | BULK BAG ISOLATION DAM |
| | BUFFER RESTORATION AREA (FOREST/SHRUB) |
| | BUFFER RESTORATION AREA (HYDROSEED) |
| | WETLAND RESTORATION AREA |
| | CONIFER TREE |
| | DECIDUOUS TREE |
| | CONIFER TREE TO BE REMOVED |
| | DECIDUOUS TREE TO BE REMOVED |



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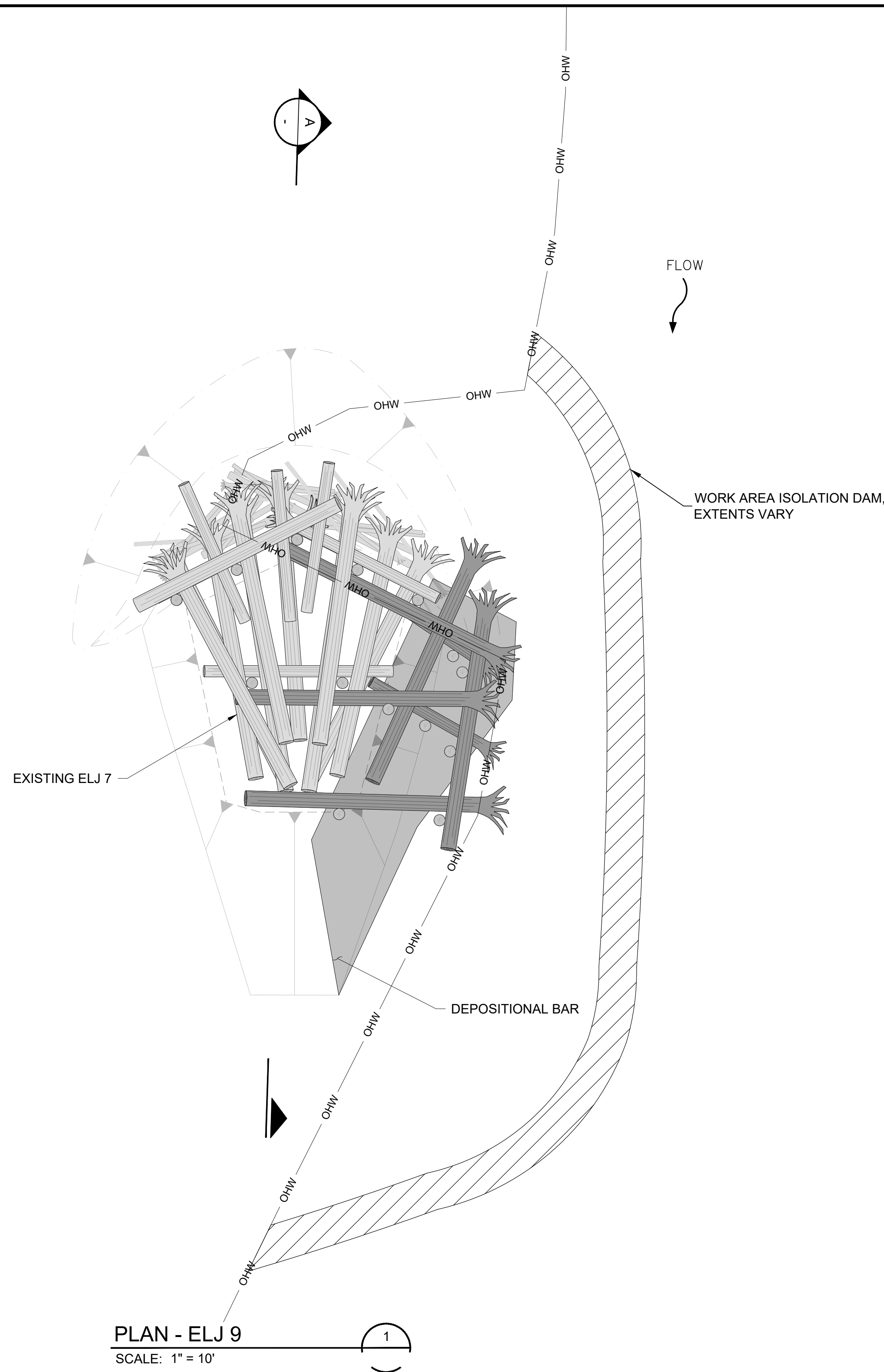


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WETLAND AND BUFFER RESTORATION AREAS C-05

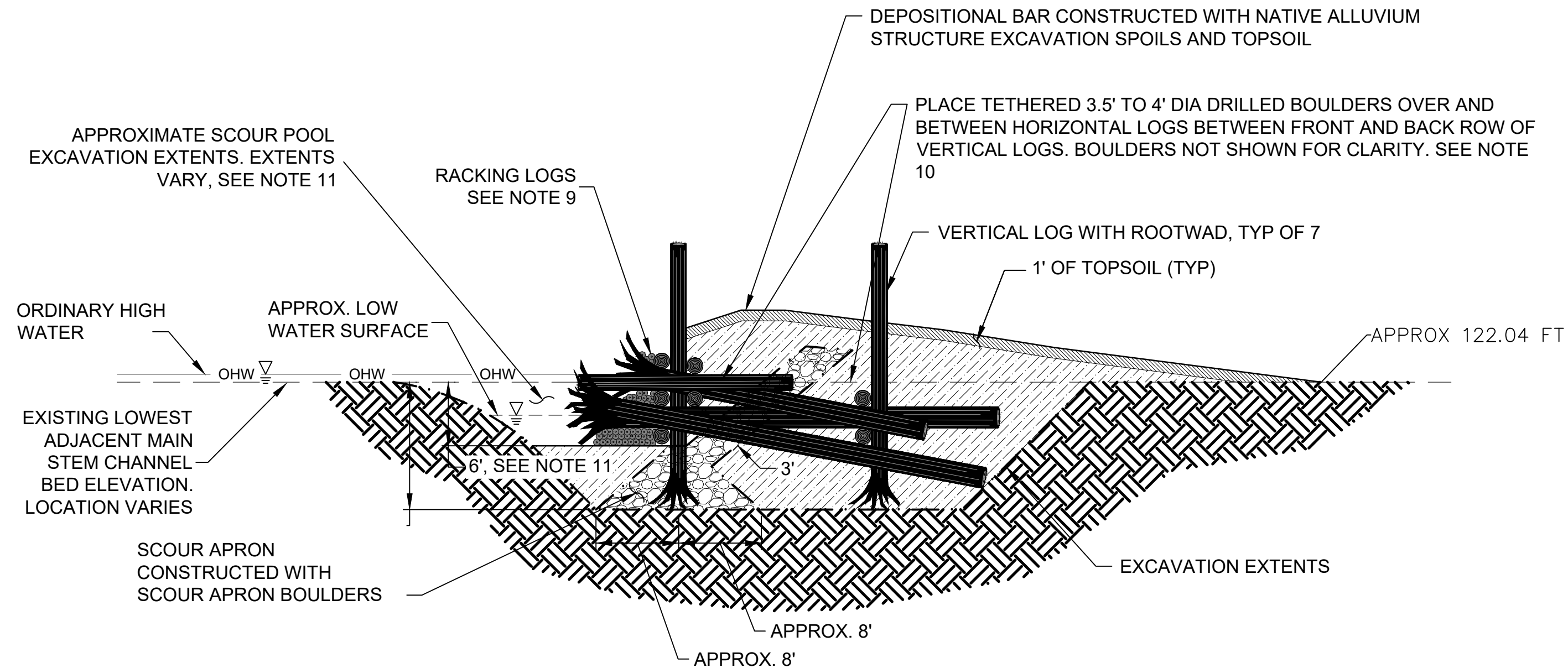
REFERENCE NO:
APPLICANT: SNOHOMISH COUNTY PUD #1
PROPOSED PROJECT: CONSTRUCT 2 ELJS
LOCATION: NEAR 138TH PLACE SE

SHEET: 05 OF 11 DATE: JUNE 2026



GENERAL NOTES:

1. PLANT DEPOSITIONAL BAR, SEE PLANTING PLAN.
2. DEPOSITIONAL BAR EXTENTS VARY.
3. EXISTING DEPOSITIONAL BAR AND TOP LAYERS OF EXISTING LOGS MAY REQUIRE REMOVAL AND REARRANGEMENT DURING CONSTRUCTION OF ELJ 9.
4. RACKING PLACEMENT SHALL BE COORDINATED WITH LOG LAYER PLACEMENT AND SLASH PLACEMENT TO ENSURE RACKING MEMBERS AND SLASH EXTEND THROUGH RACKING MATERIAL.
5. CAP DEPOSITIONAL BAR WITH 1' OF GRUBBED OR IMPORTED TOP SOIL TO THE EXTENTS SHOWN ON PLANS.
6. EXISTING WOODY DEBRIS SHALL BE CLEARED AND STOCKPILED FOR USE AS RACKING OR SLASH AS SUITABLE.
7. EXCAVATION SPOILS SHALL BE STOCKPILED TO ALLOW LOG LAYER PLACEMENT AND CONSTRUCTION ACCESS.
8. ACCOUNT FOR TEMPORARY EXCAVATION EXTENTS WHEN LOCATION WORK AREA ISOLATION.
9. RACKING LOGS SHOWN IN THE SECTION SHALL BE INSTALLED WITH APPROXIMATELY 1/3 OF THE LOGS ON THE UPSTREAM FACE OF THE ELJ AND PERPENDICULAR TO THE FLOW, 1/3 PARALLEL TO THE FLOW AND EXTENDING INTO THE CORE OF THE STRUCTURE AND 1/3 PLACED IN RANDOM ORIENTATIONS. PLACEMENT SHALL PRODUCE AN INTERLOCKING/WOVEN EFFECT BETWEEN THE LOG MEMBERS, RACKING, AND SLASH WITH MINIMIZED VOIDS.
10. PLACE TETHERED BOULDERS AS SHOWN ON STRUCTURE LAYERING PLAN, SHEET 07.
11. SCOUR POOL EXTENTS WILL VARY FOR EACH STRUCTURE.
12. DEPTH TO TOE OF EXCAVATION SHALL BE MEASURED FROM THE ADJACENT MAINSTEM CHANNEL BOTTOM



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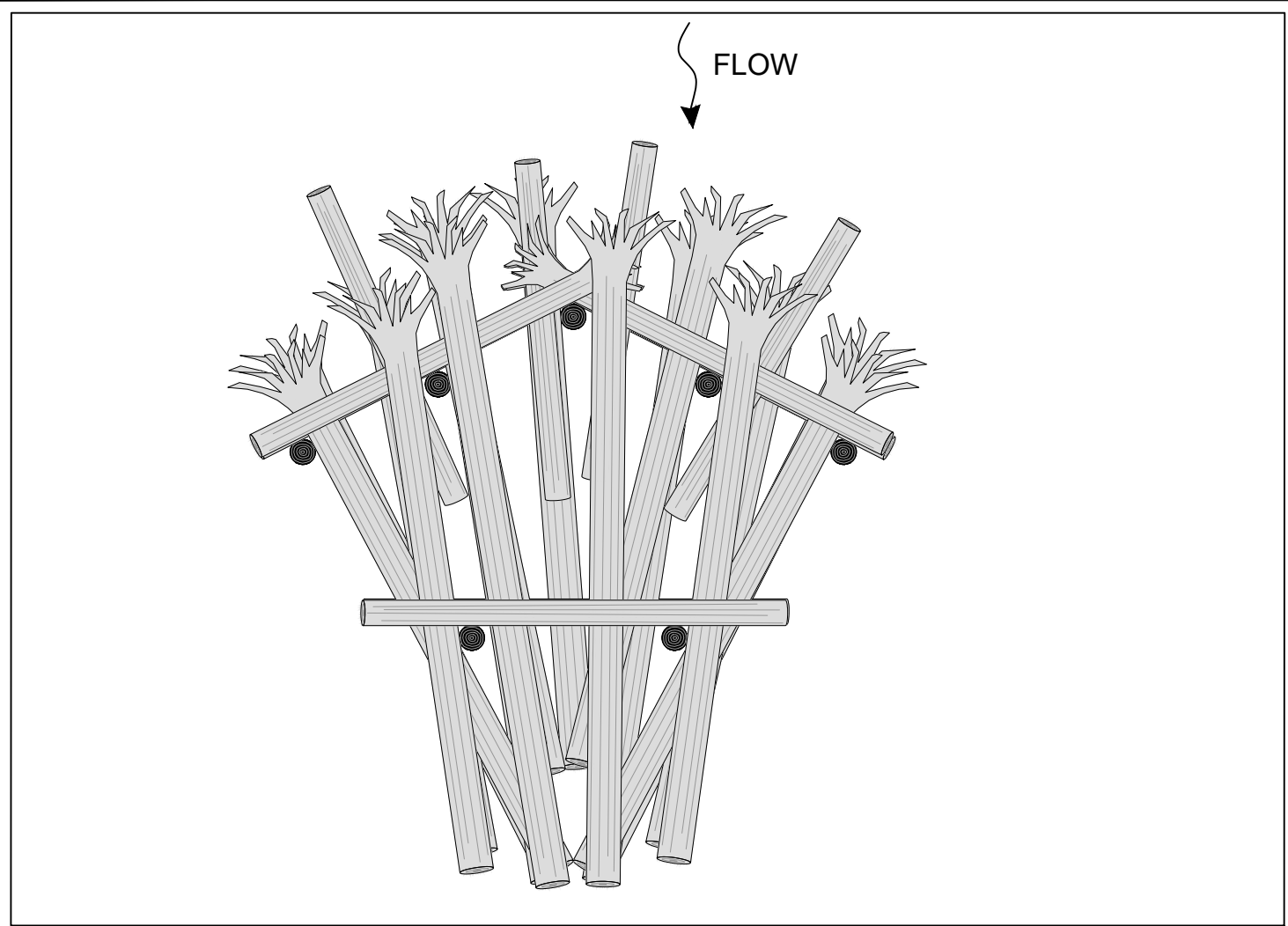
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ELJ 9

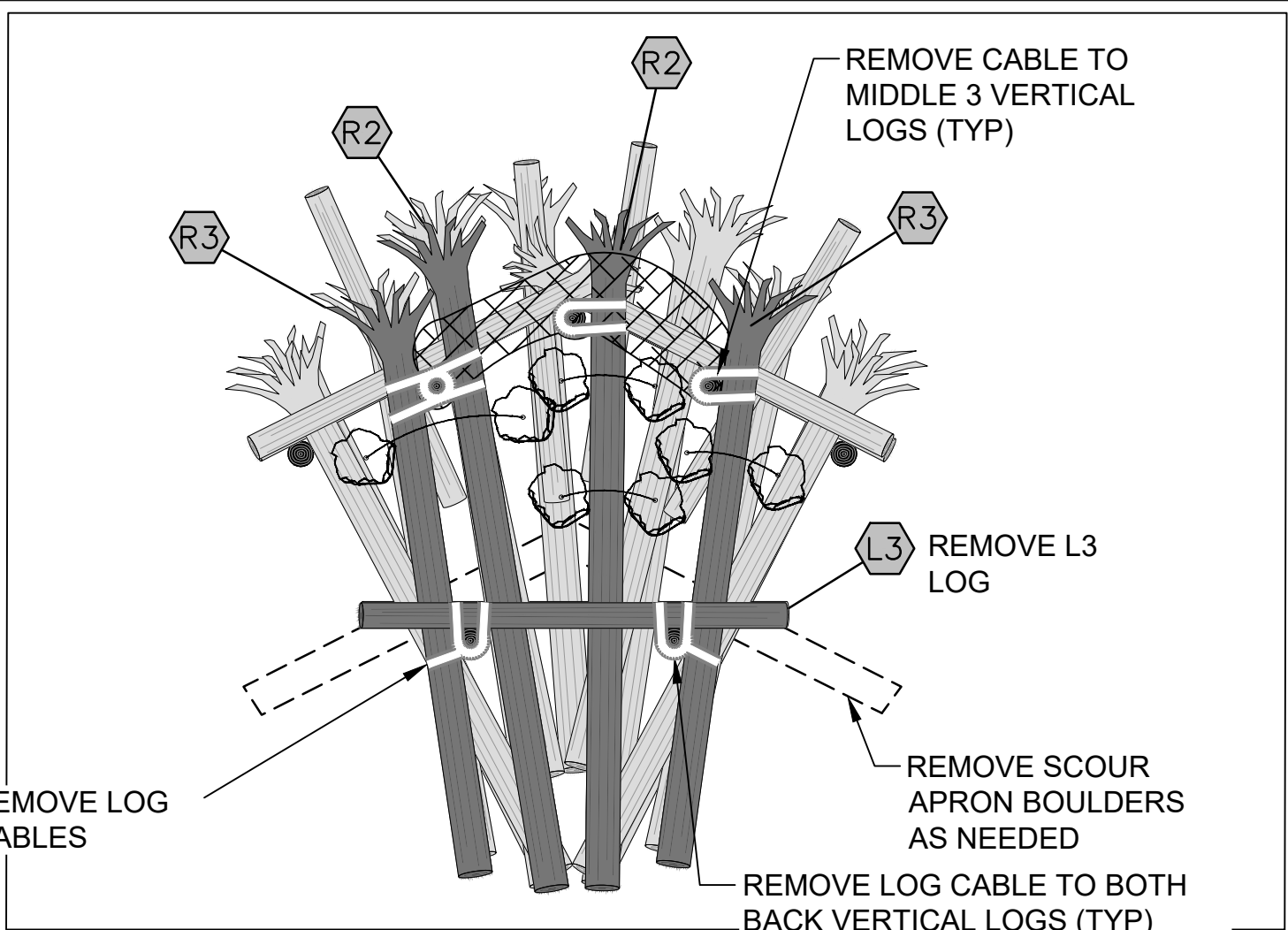
C-06

REFERENCE NO:
APPLICANT: SNOHOMISH COUNTY PUD #1
PROPOSED PROJECT: CONSTRUCT 2 ELJS
LOCATION: NEAR 138TH PLACE SE

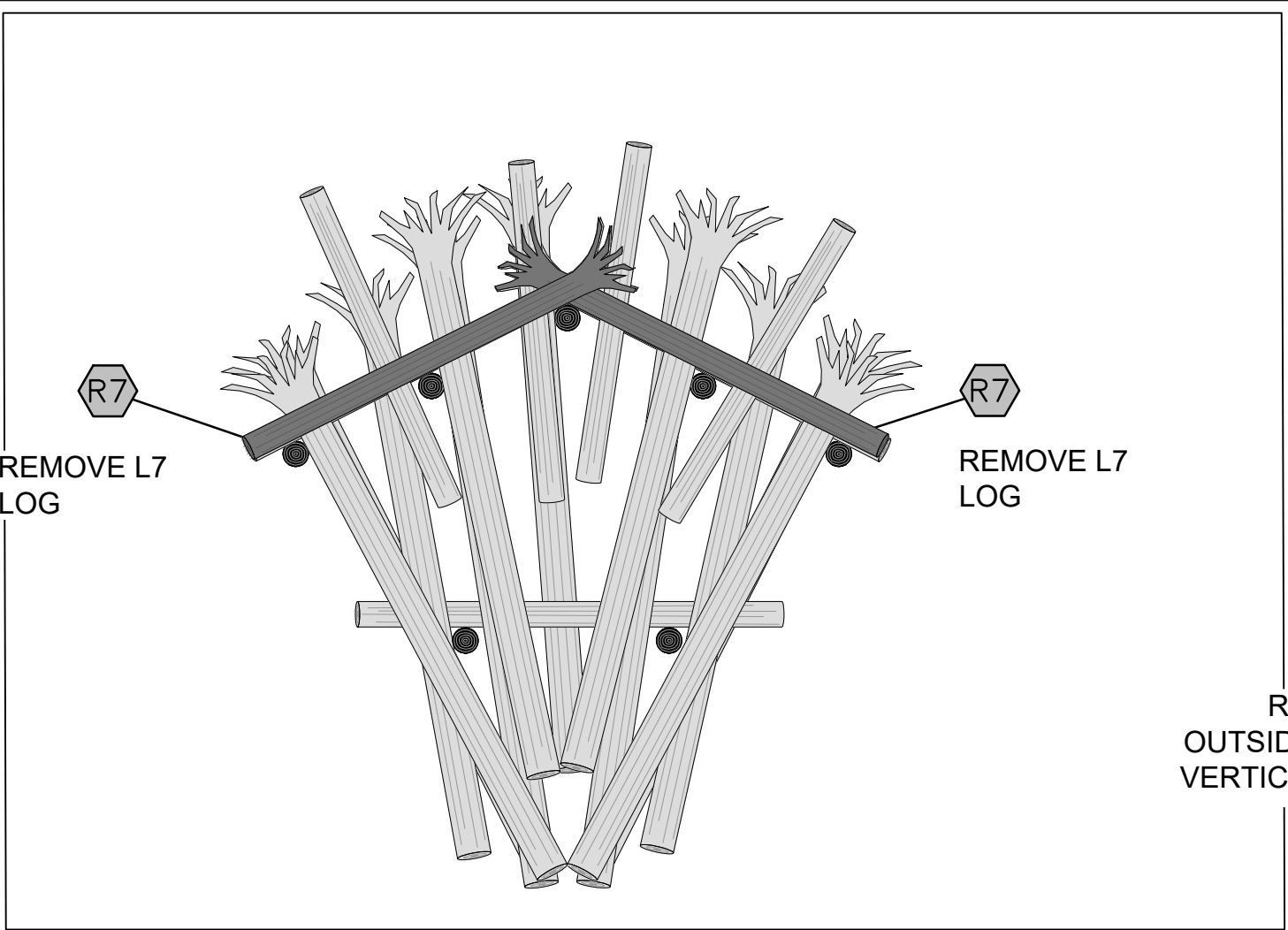
SHEET: 06 OF 11 DATE: JUNE 2026



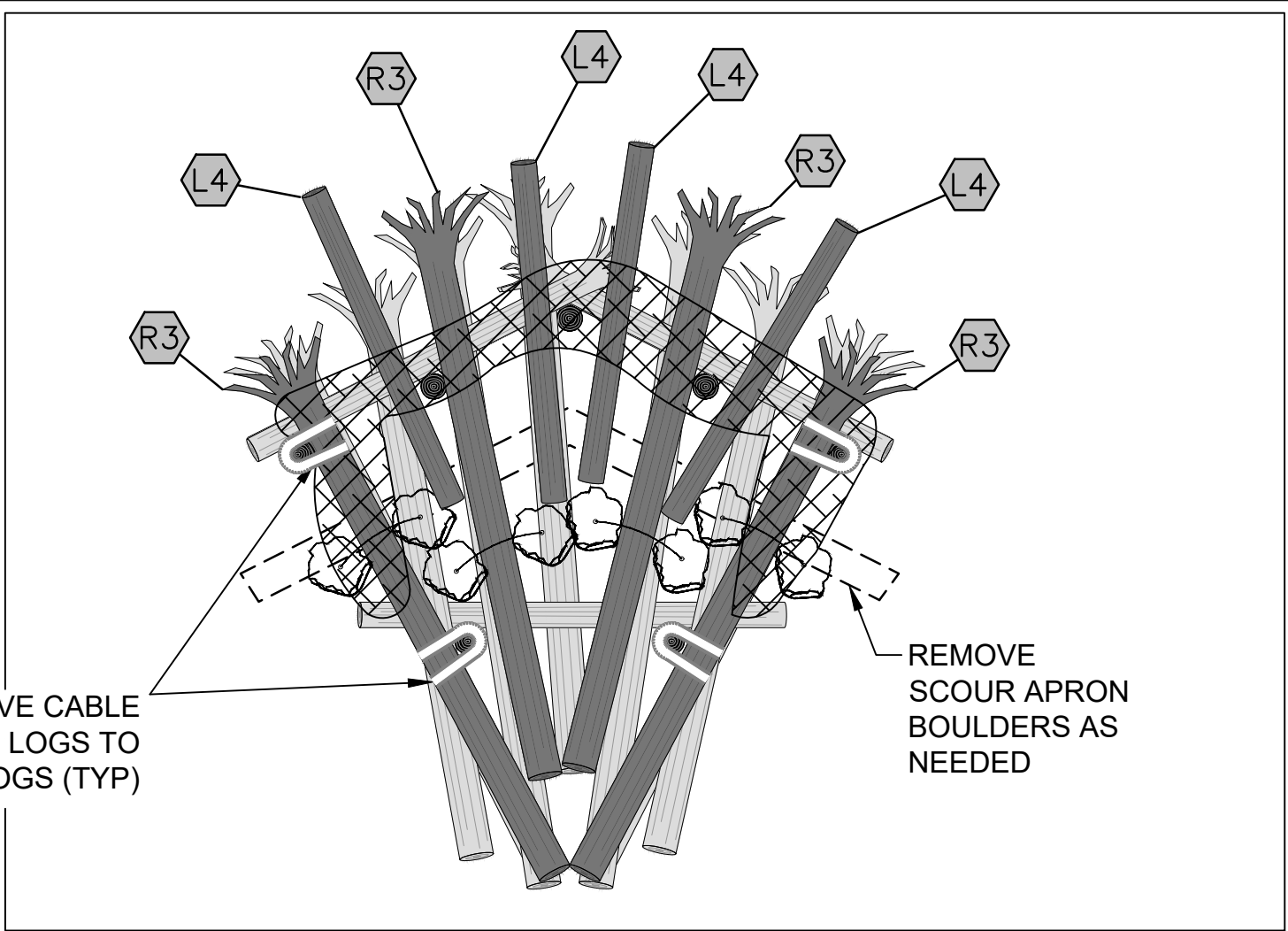
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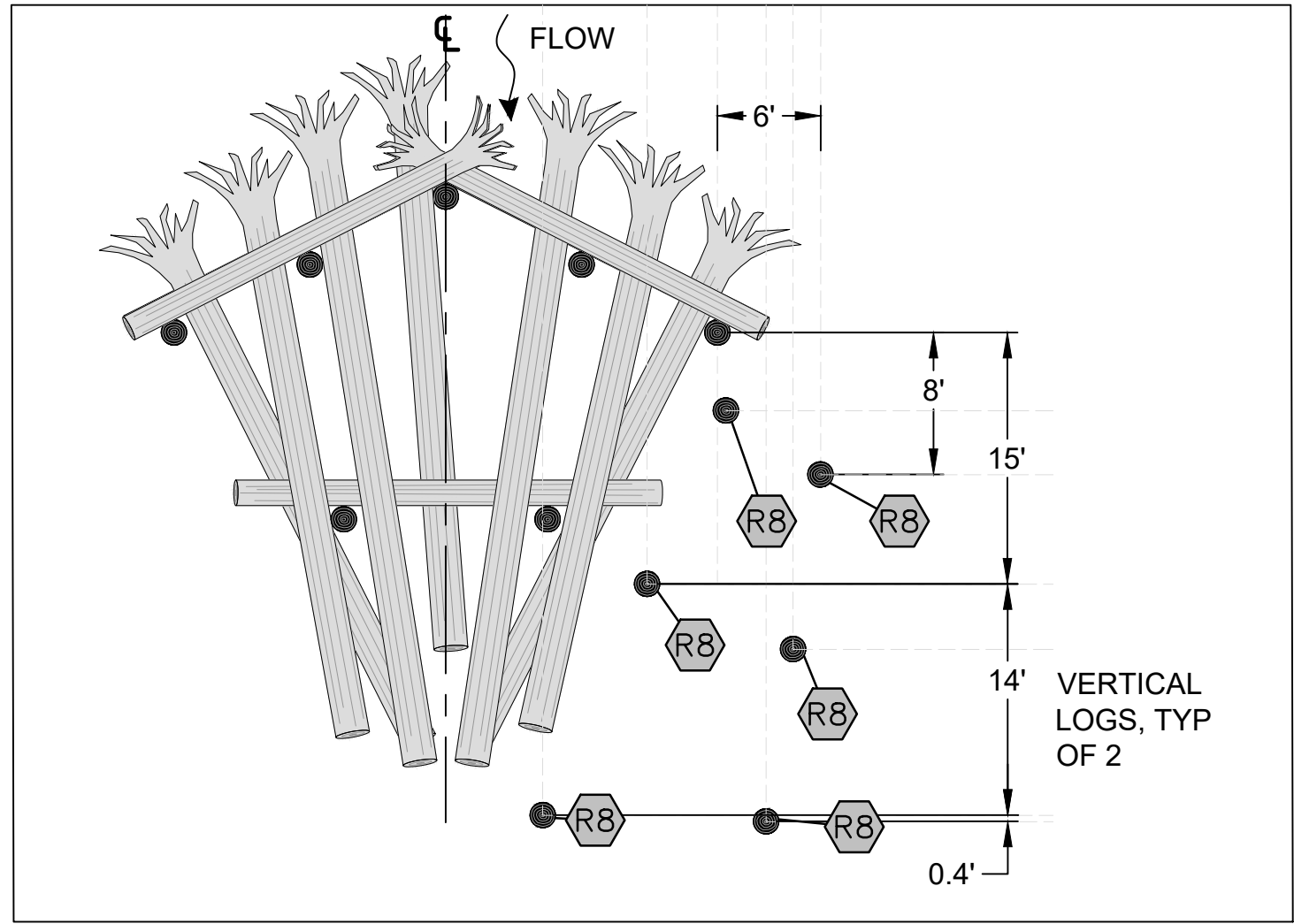
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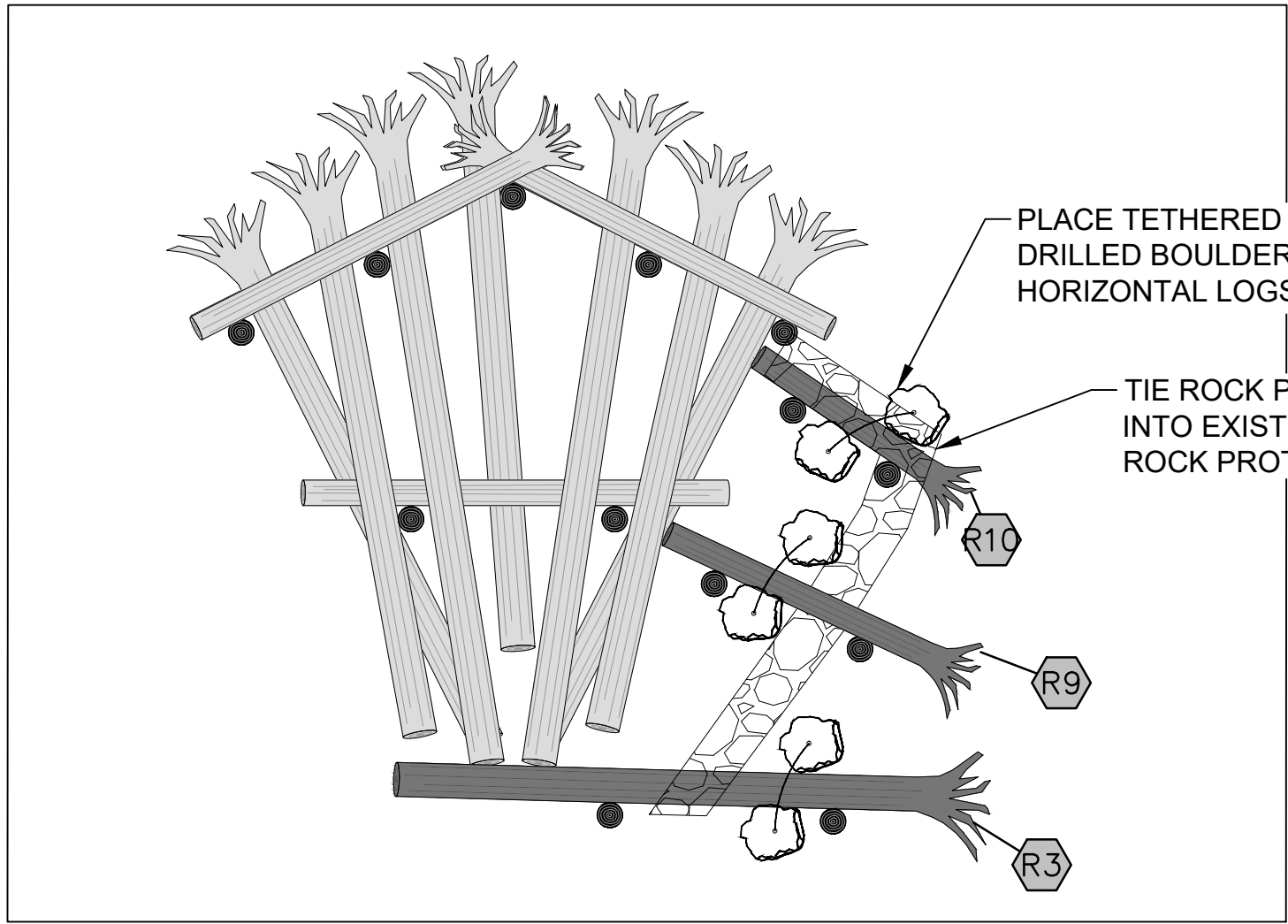
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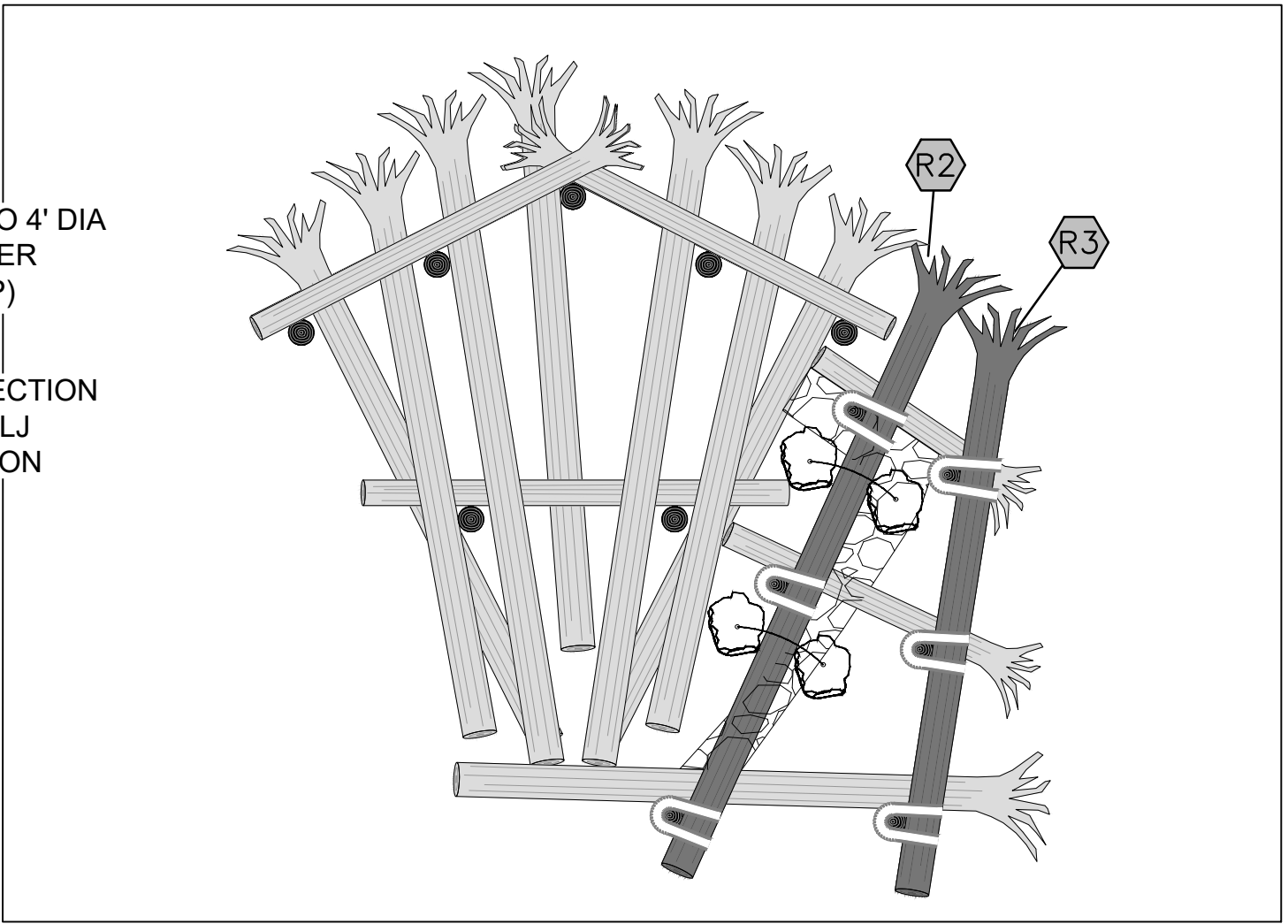
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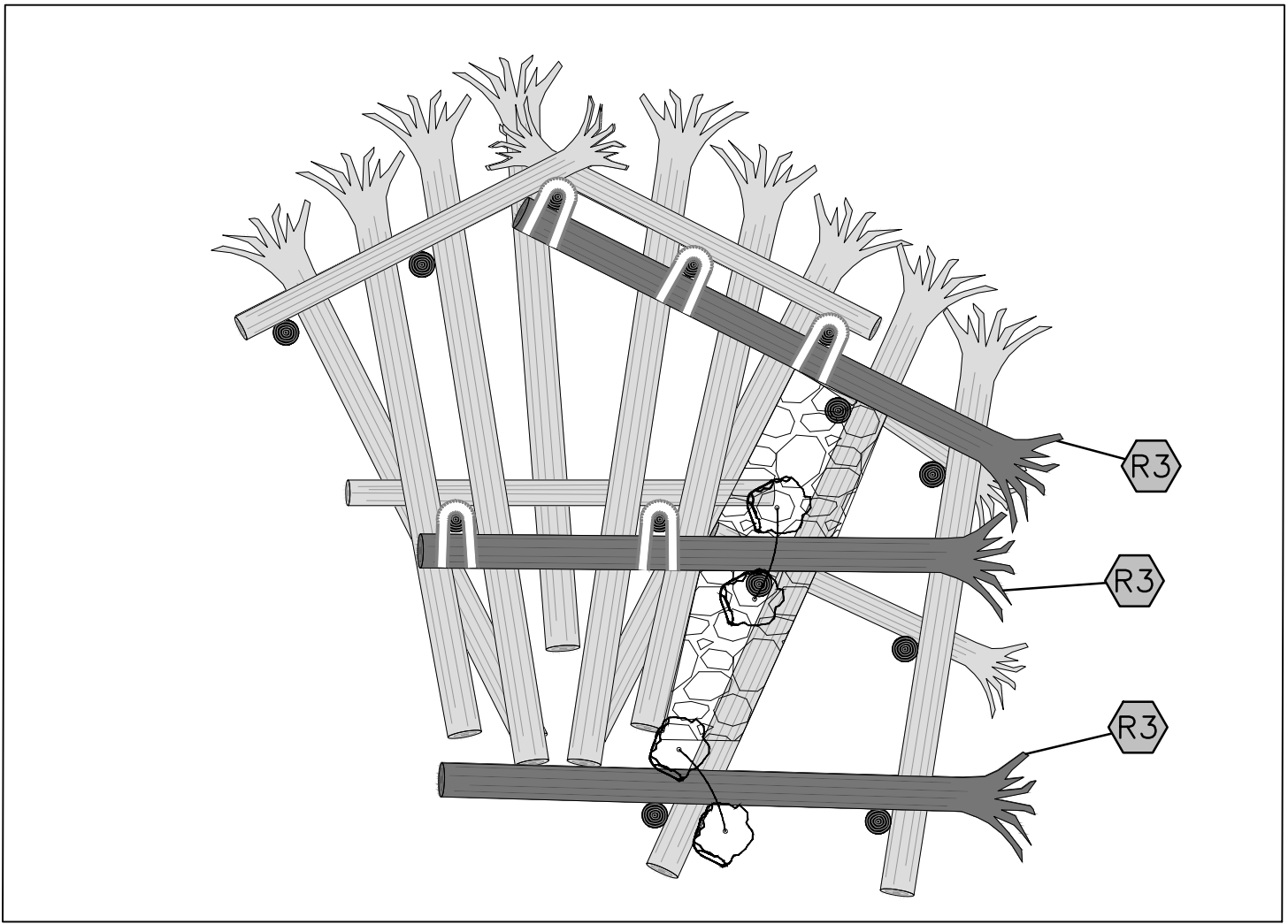
RECONSTRUCTION LAYER 1



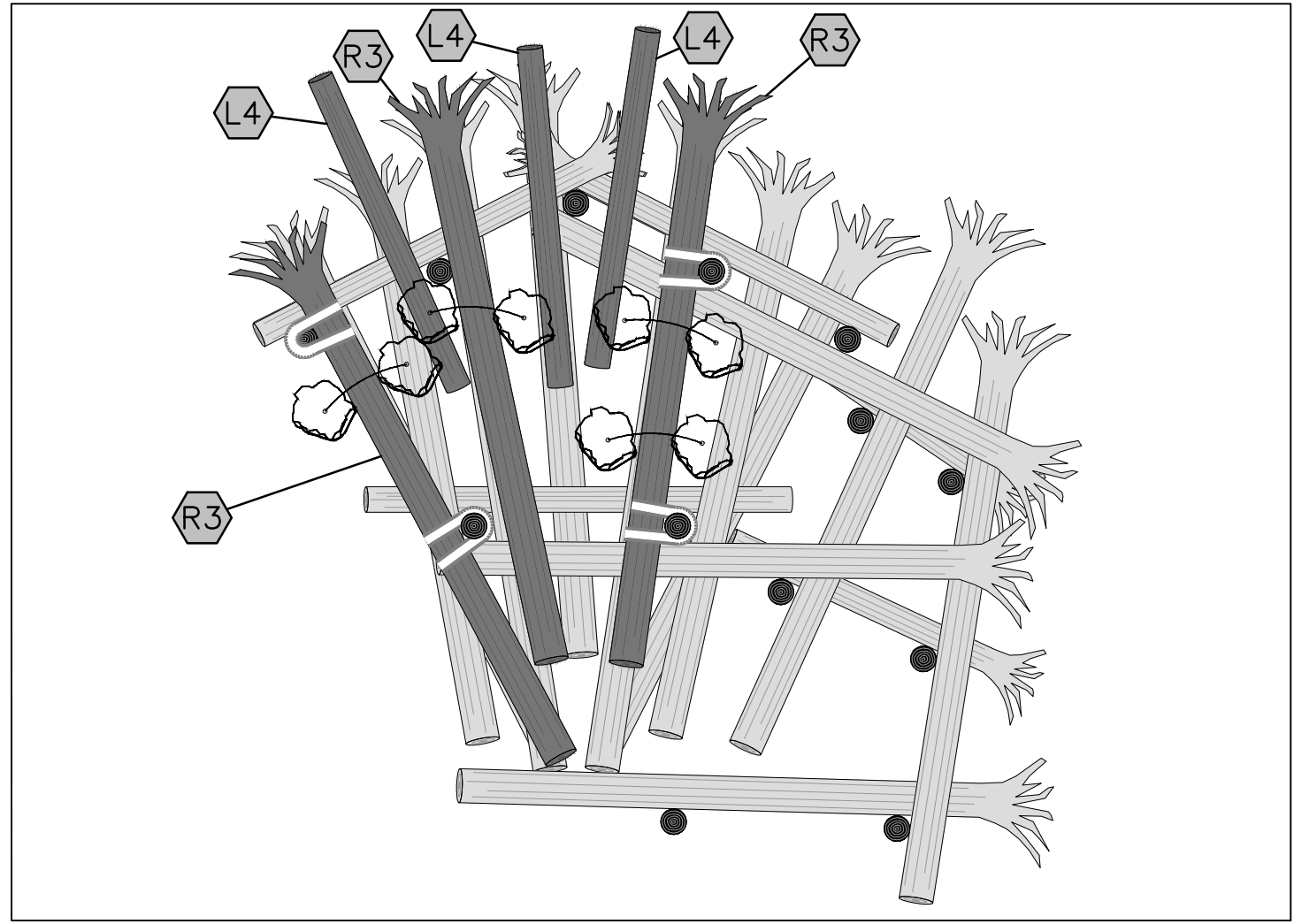
RECONSTRUCTION LAYER 2



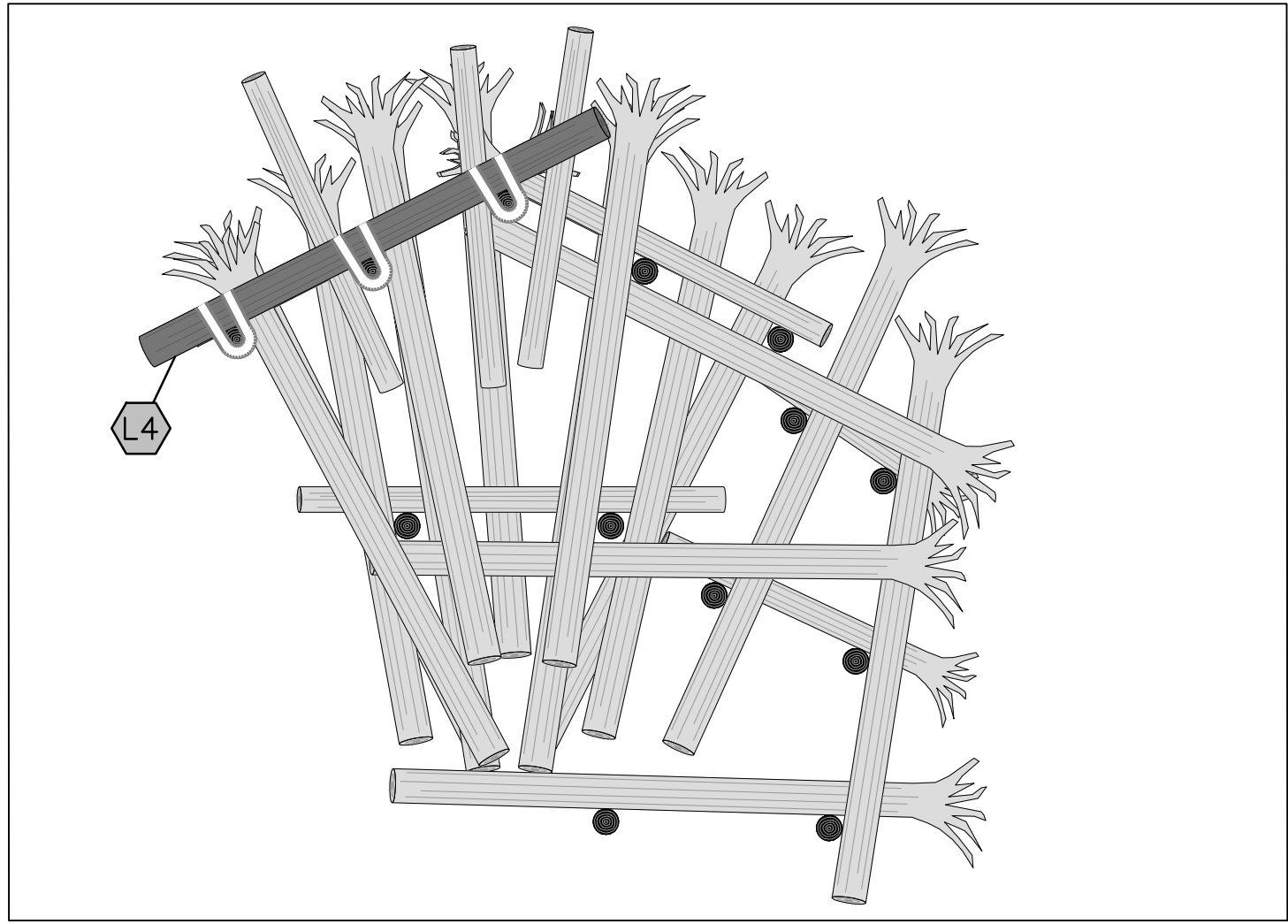
RECONSTRUCTION LAYER 3



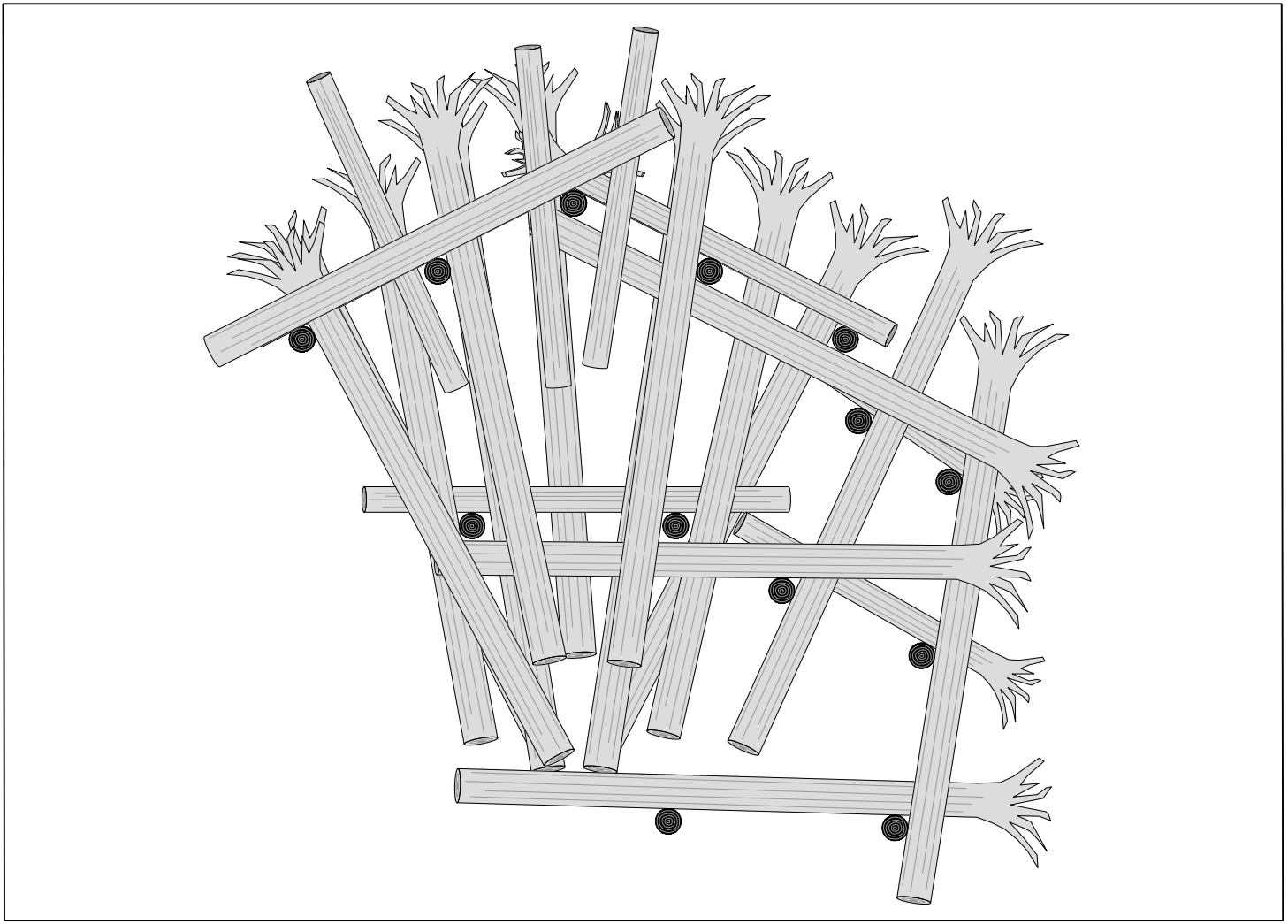
RECONSTRUCTION LAYER 4



RECONSTRUCTION LAYER 5



RECONSTRUCTION LAYER 6



COMPLETE

GENERAL NOTES:

1. SEE SHEET 09 FOR GENERAL NOTES
2. PROJECT REPRESENTATIVE WILL ASSESS THE CONDITION OF THE REMOVED EXISTING LOGS AND REPLACE WITH IMPORTED LOGS WHEN THE LOG CONDITIONS ARE DETERMINED TO BE UNSATISFACTORY.



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SNOHOMISH COUNTY
PUD
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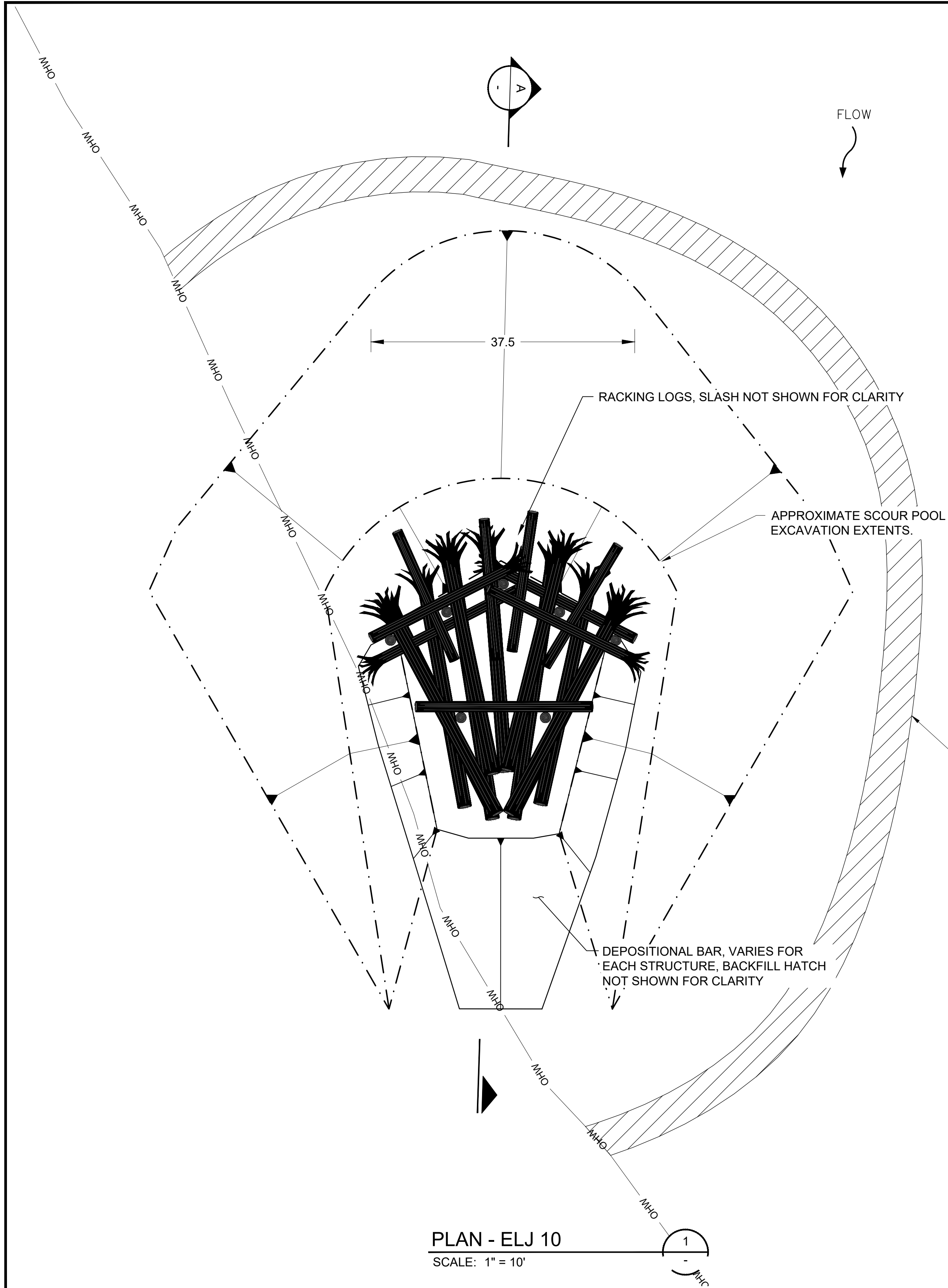
ELJ 9 LAYERING PLAN

C-07

REFERENCE NO:
APPLICANT:
PROPOSED PROJECT:
LOCATION:

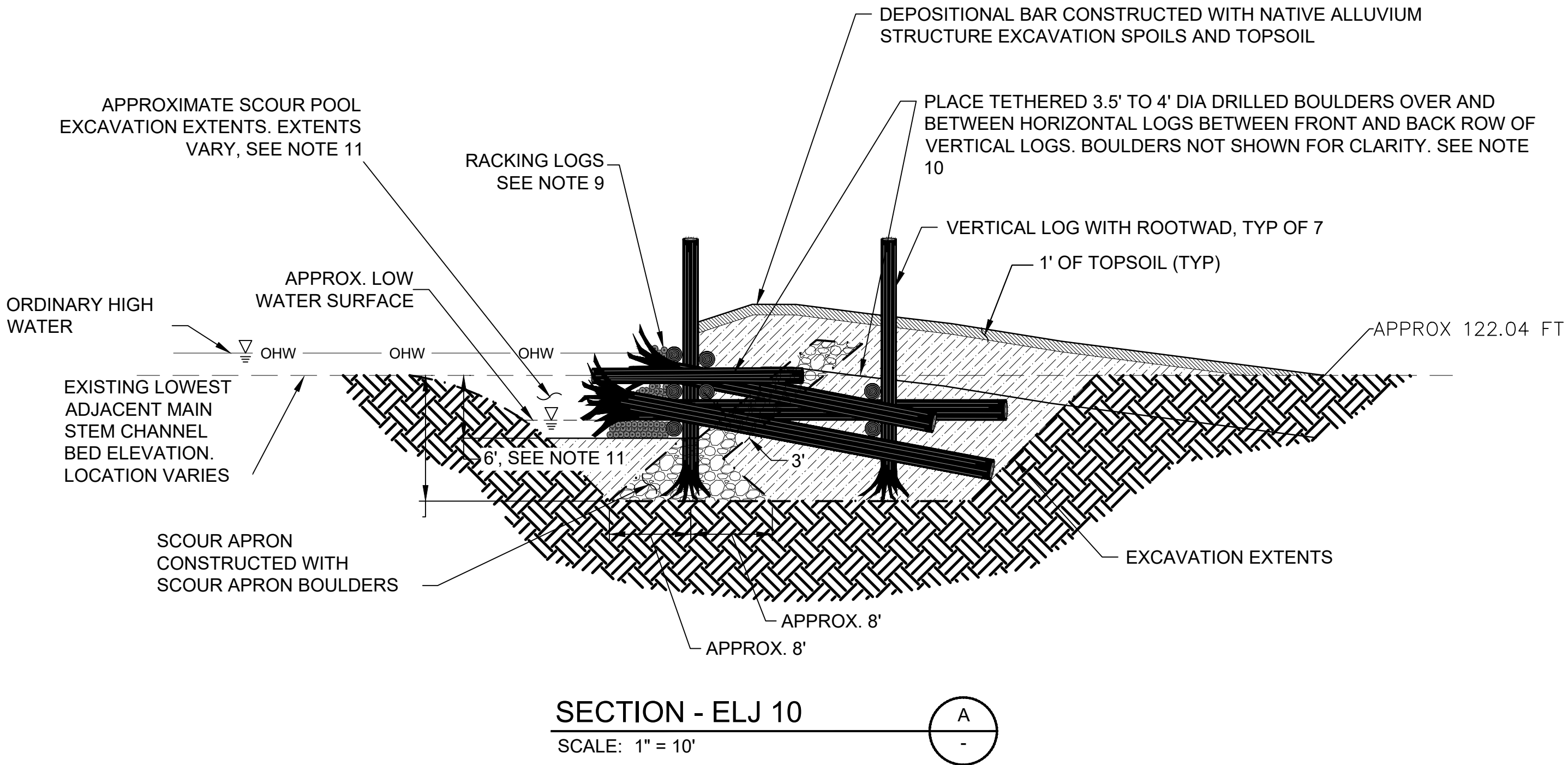
SNOHOMISH COUNTY PUD #1
CONSTRUCT 2 ELJS
NEAR 138TH PLACE SE

SHEET: 07 OF 11 DATE: JUNE 2026



GENERAL NOTES:

1. PLANT DEPOSITIONAL BAR, SEE PLANTING PLAN.
2. DEPOSITIONAL BAR EXTENTS VARY.
3. CONTRACTOR SHALL IDENTIFY FINAL GRADING EXTENTS 3 DAYS PRIOR TO COMPLETION OF GRADING ACTIVITIES.
4. RACKING PLACEMENT SHALL BE COORDINATED WITH LOG LAYER PLACEMENT AND SLASH PLACEMENT TO ENSURE RACKING MEMBERS AND SLASH EXTEND THROUGH RACKING MATERIAL.
5. CAP DEPOSITIONAL BAR WITH 1' OF GRUBBED OR IMPORTED TOP SOIL TO THE EXTENTS SHOWN ON PLANS.
6. EXISTING WOODY DEBRIS SHALL BE CLEARED AND STOCKPILED FOR USE AS RACKING OR SLASH AS SUITABLE.
7. EXCAVATION SPOILS SHALL BE STOCKPILED TO ALLOW LOG LAYER PLACEMENT AND CONSTRUCTION ACCESS.
8. CONTRACTOR SHALL USE SHORING OR EXTRA EXCAVATION AS REQUIRED FOR LOCAL SOIL CONDITIONS ENCOUNTERED. SHORING EXTENTS MAY VARY DEPENDING ON CONSTRUCTION TECHNIQUES USED AND LOCAL SOIL PROPERTIES ENCOUNTERED.
9. RACKING LOGS SHOWN IN THE SECTION SHALL BE INSTALLED WITH APPROXIMATELY 1/3 OF THE LOGS ON THE UPSTREAM FACE OF THE ELJ AND PERPENDICULAR TO THE FLOW, 1/3 PARALLEL TO THE FLOW AND EXTENDING INTO THE CORE OF THE STRUCTURE AND 1/3 PLACED IN RANDOM ORIENTATIONS. PLACEMENT SHALL PRODUCE AN INTERLOCKING/WOVEN EFFECT BETWEEN THE LOG MEMBERS, RACKING, AND SLASH WITH MINIMIZED VOIDS.
10. PLACE TETHERED BOULDERS AS SHOWN ON STRUCTURE LAYERING PLAN, SHEET 09.
11. SCOUR POOL EXTENTS WILL VARY.
12. DEPTH TO TOE OF EXCAVATION SHALL BE MEASURED FROM THE ADJACENT MAINSTEM CHANNEL BOTTOM



SHANNON & WILSON

ELJ 10

C-08

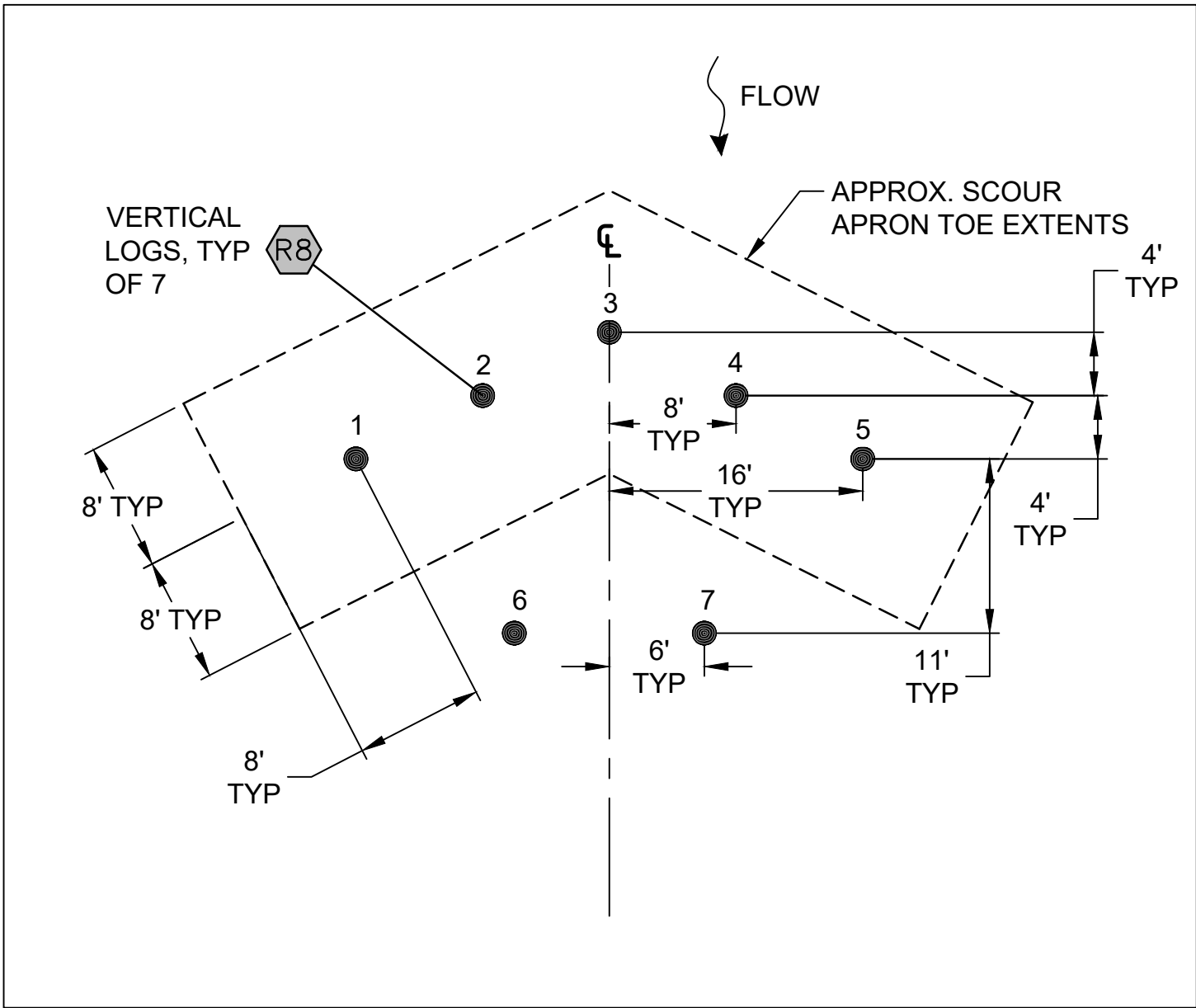


SNOHOMISH COUNTY PUD
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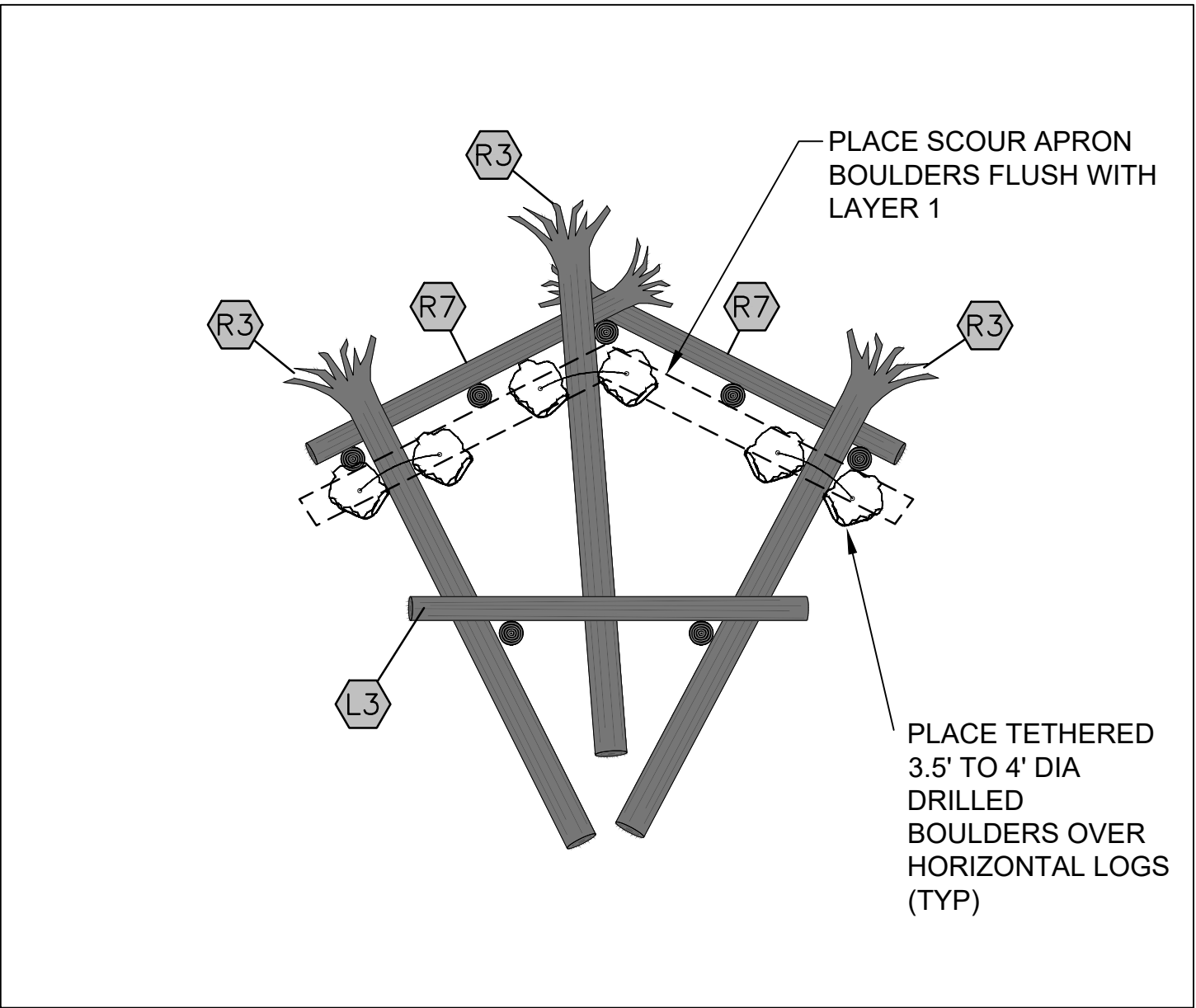
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APPLICANT:
PROPOSED PROJECT:
LOCATION:

SNOHOMISH COUNTY PUD #1
CONSTRUCT 2 ELJS
NEAR 138TH PLACE SE

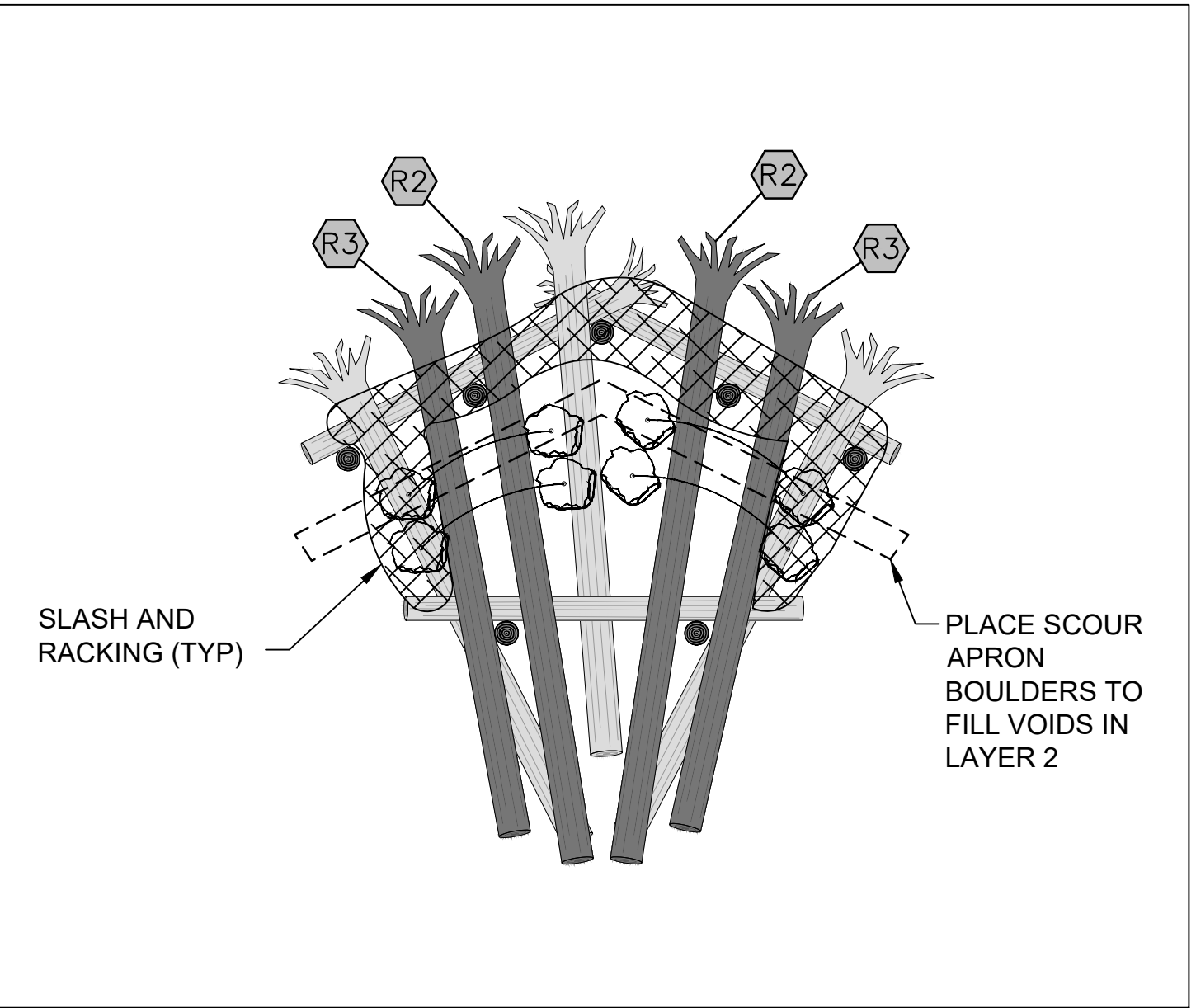
SHEET: 08 OF 11 DATE: JUNE 2026



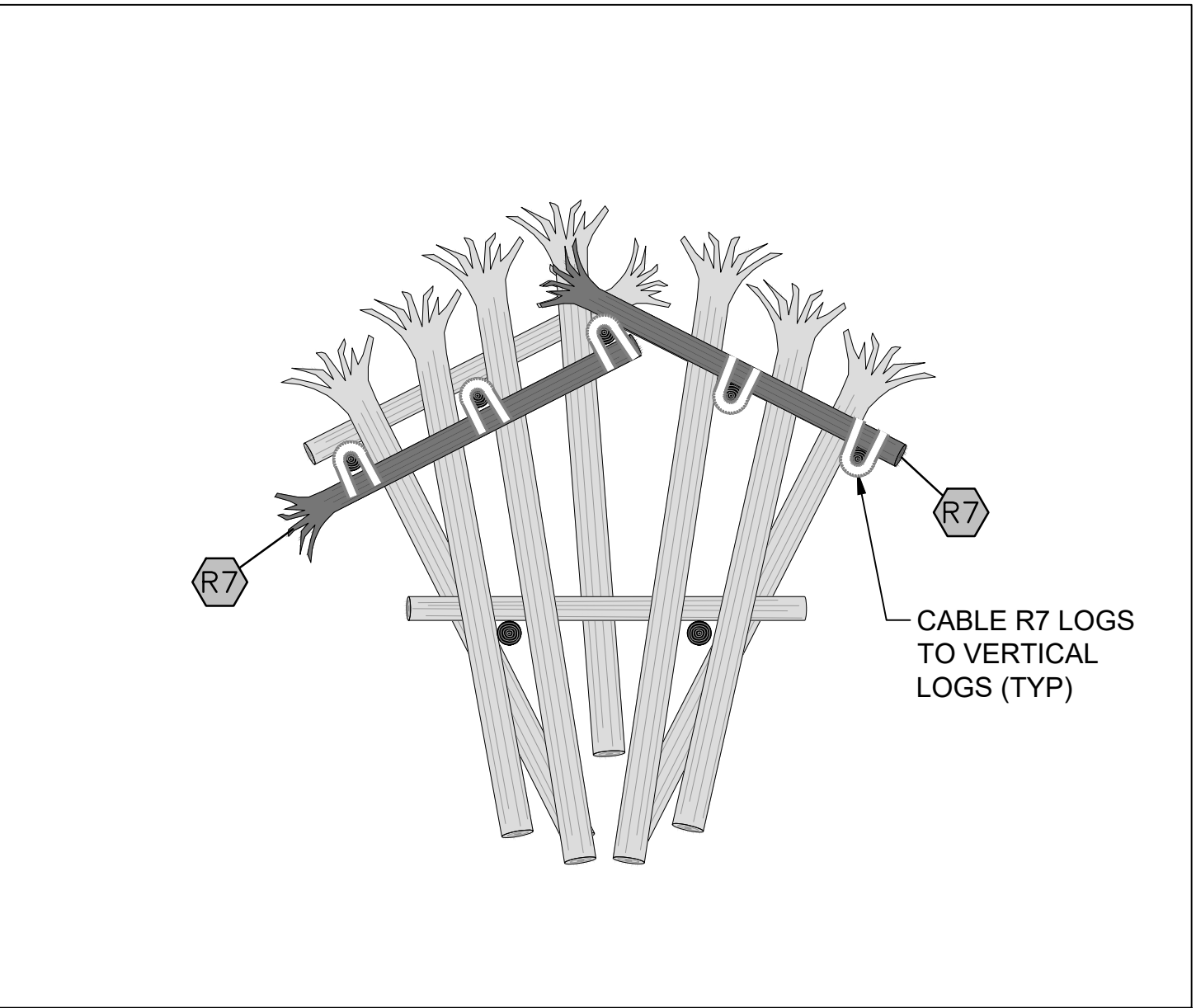
VERTICAL LOGS AND SCOUR APRON



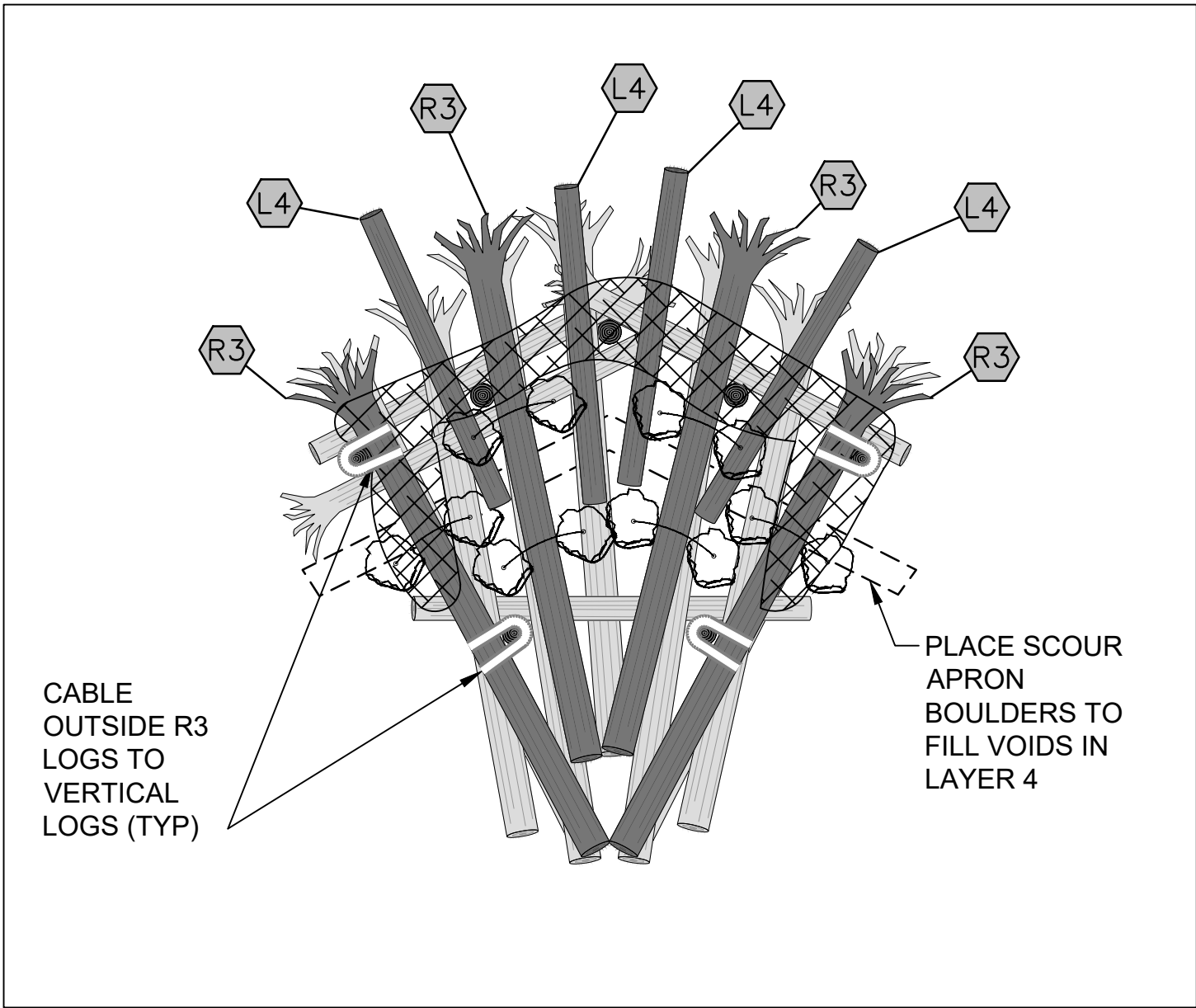
LAYER 1



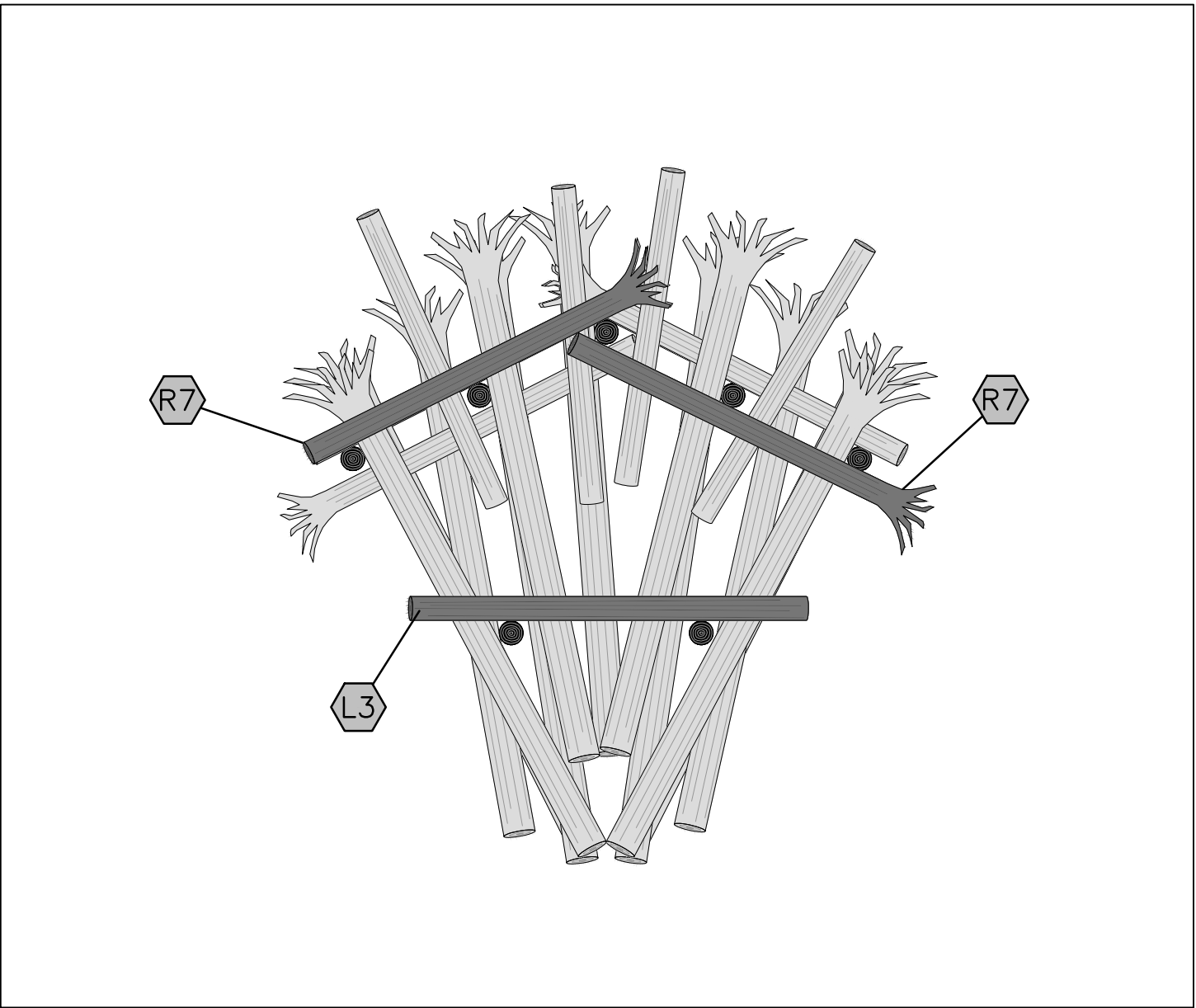
LAYER 2



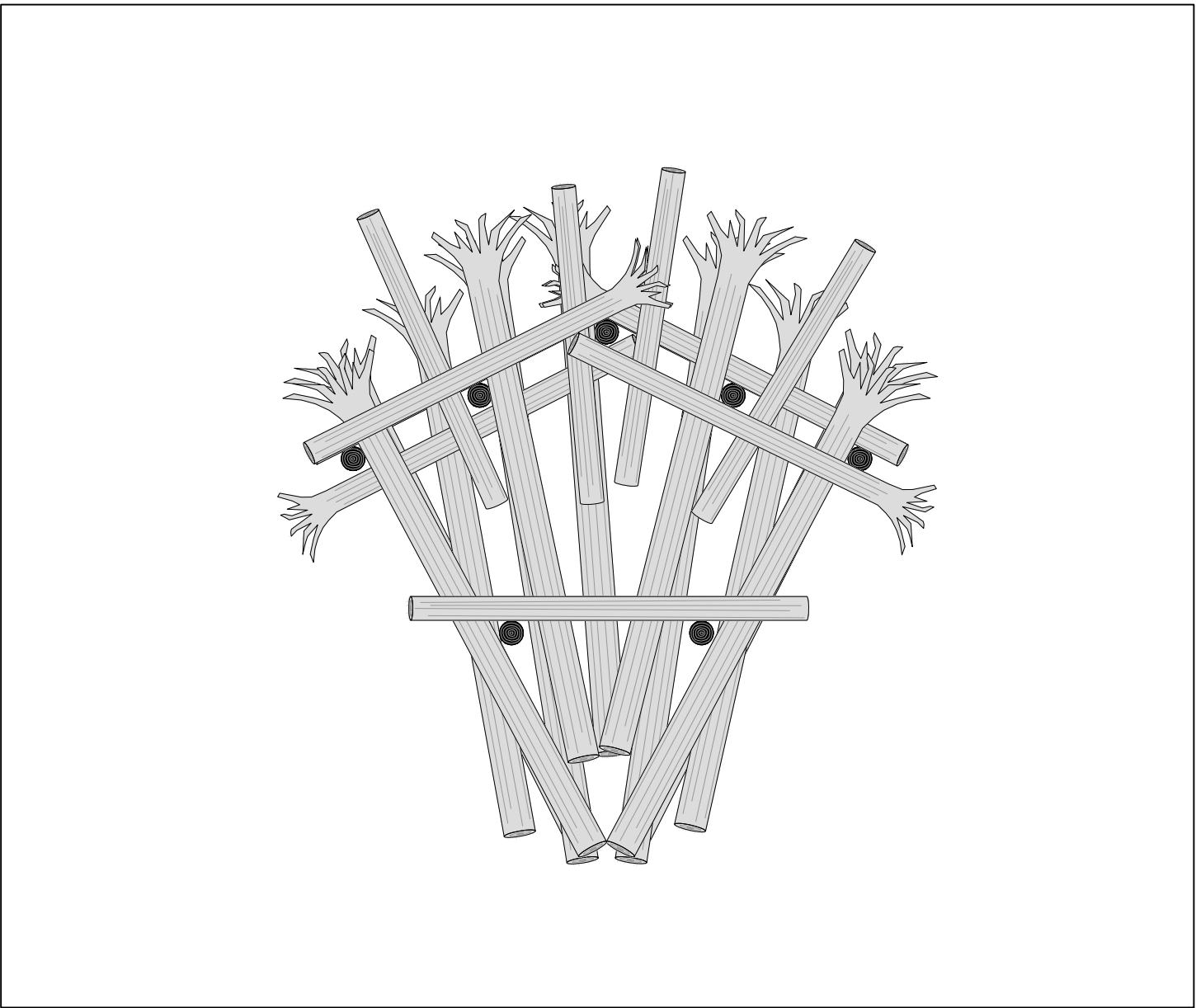
LAYER 3



LAYER 4



LAYER 5



COMPLETE

GENERAL NOTES:

- ENGINEER SHALL STAKE 1) LOCATION OF TWO VERTICAL LOGS, OR 2) OFFSETS FOR TWO VERTICAL LOGS IF LOCATION IS NOT ACCESSIBLE. STAKES SHALL INDICATE WHICH PILE THE STAKE REFERS TO. CONTRACTOR SHALL CONFIRM LOCATION OF VERTICAL LOGS WITH ENGINEER PRIOR TO BEGINNING ELJ CONSTRUCTION ACTIVITIES.
- LOG MATERIALS SHALL BE PLACED AT THE LOCATIONS, ELEVATIONS AND ORIENTATIONS SPECIFIED ON THE DRAWINGS OR AS DIRECTED BY THE ENGINEER. TRIM LOGS TO FIT AS REQUIRED.
- PLACE SLASH OVER AND BETWEEN KEY LOGS AND PILES AS SHOWN FOR EACH LAYER FOLLOWING PLACEMENT OF KEY LOGS AND RACKING LOGS. PLACE APPROXIMATELY 2' TO 3' OF NATIVE ALLUVIUM OVER 1/2 THE WIDTH OF SLASH TO SECURE IN PLACE SUCH THAT SLASH IS VISIBLE FOLLOWING CONSTRUCTION. COORDINATE WITH ENGINEER PRIOR TO PLACING RACKING AND SLASH.
- CABLE VERTICAL LOGS AT CONTACT POINTS. CABLE LASHING SYSTEM SHALL BE PUT IN TENSION TO 1/4 OF ITS WORKING LOAD LIMIT AND MAINTAINED DURING CABLE CLAMPING.
- LOCATION OF TETHERED BOULDERS SHOWN IS APPROXIMATE AND WILL VARY BASED ON ROCK SIZE AND LOG DIAMETER. PLACE TETHERED BOULDERS AS CLOSE TO LOCATION SHOWN ON THESE LAYERING PLANS, OR AS DIRECTED BY THE ENGINEER IF THEIR LOCATION DIFFERS SIGNIFICANTLY THAN AS SHOWN. ENGINEER TO APPROVE OF FINAL LOCATION.
- WIRE ROPE LENGTH REQUIRED WILL VARY BASED ON LOG SIZES USED.



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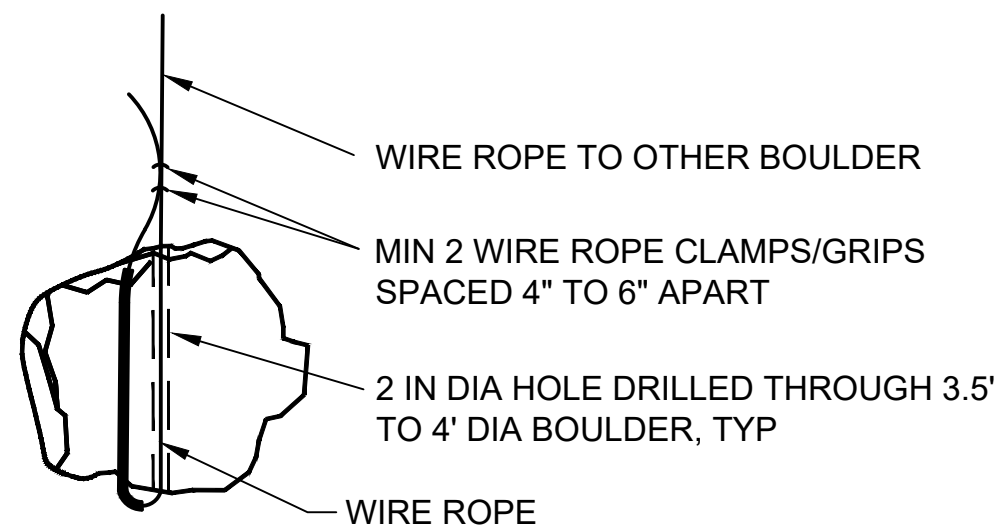
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ELJ 10 LAYERING PLAN

C-09

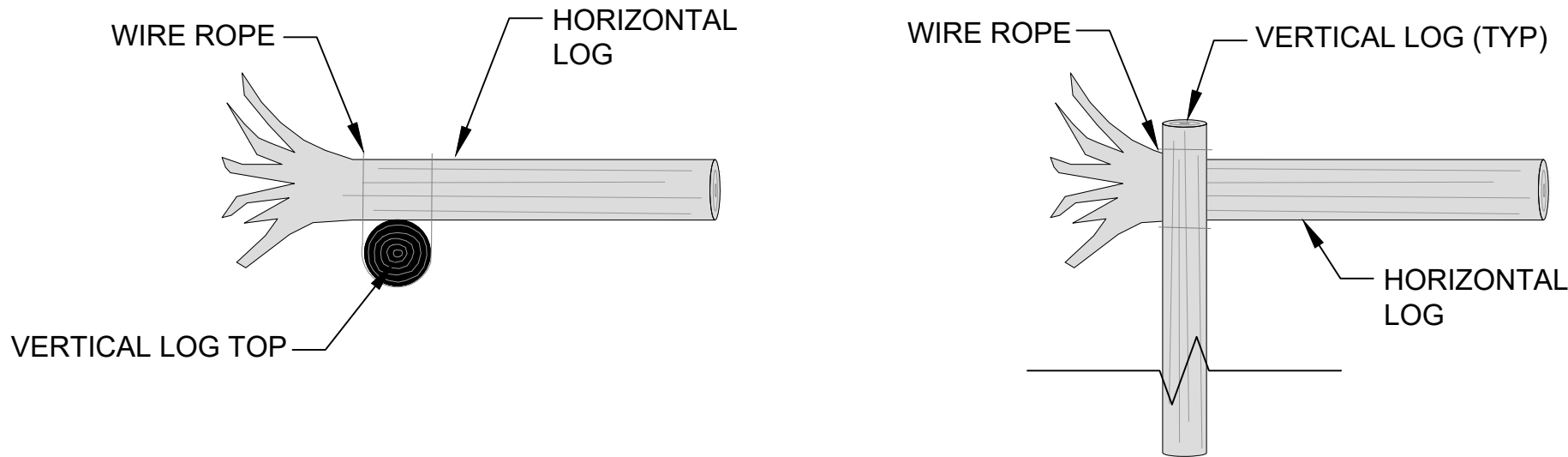
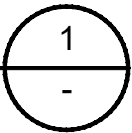
REFERENCE NO:
APPLICANT: SNOHOMISH COUNTY PUD #1
PROPOSED PROJECT: CONSTRUCT 2 ELJS
LOCATION: NEAR 138TH PLACE SE

SHEET: 09 OF 11 DATE: JUNE 2026



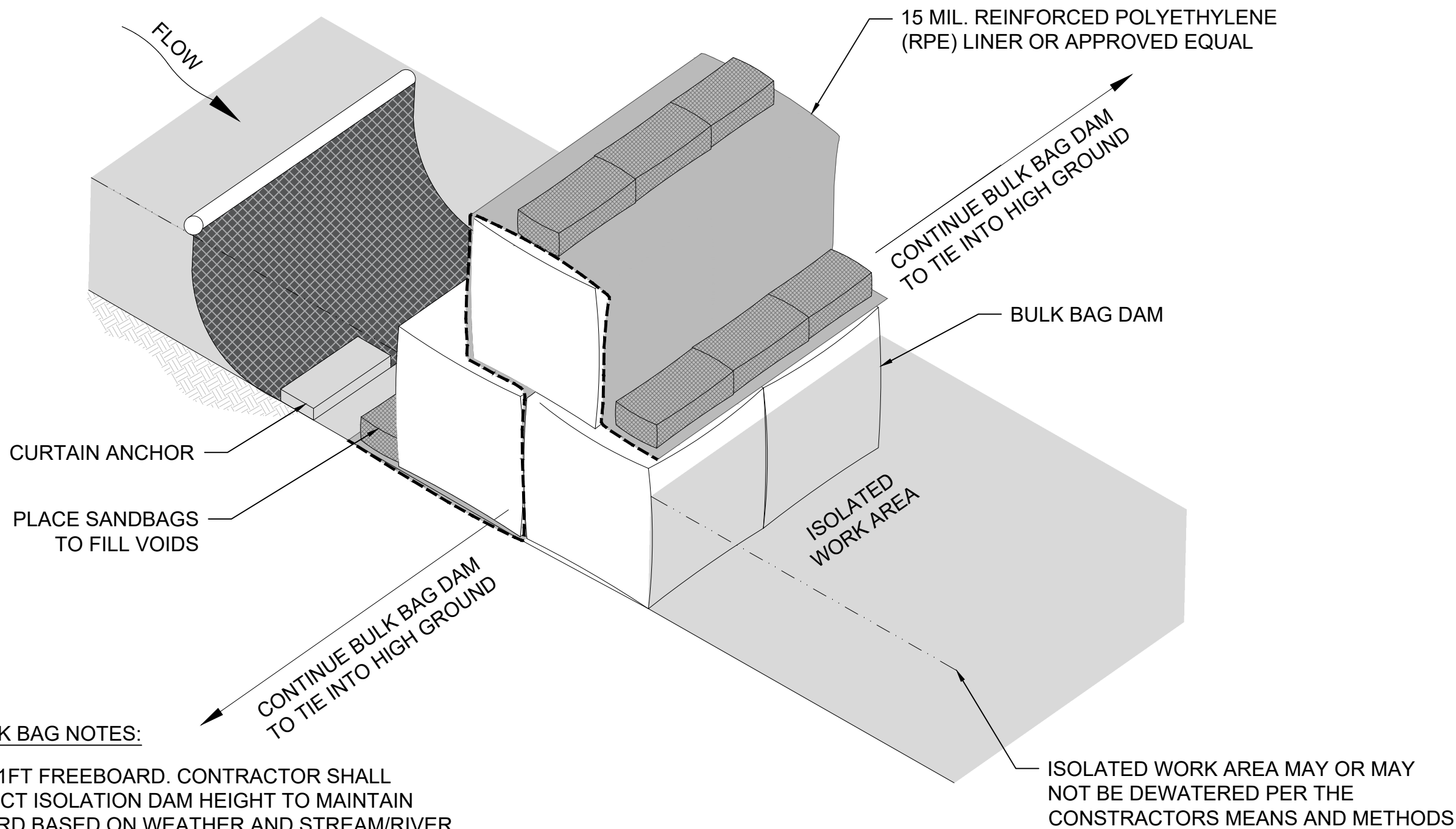
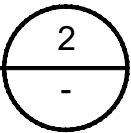
DETAIL - TETHERED 3.5' TO 4' DIA
DRILLED BOULDER

SCALE: NTS



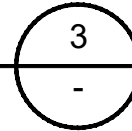
DETAIL - LASHING

SCALE: NTS



DETAIL - STACKED BULK BAG

SCALE: NTS

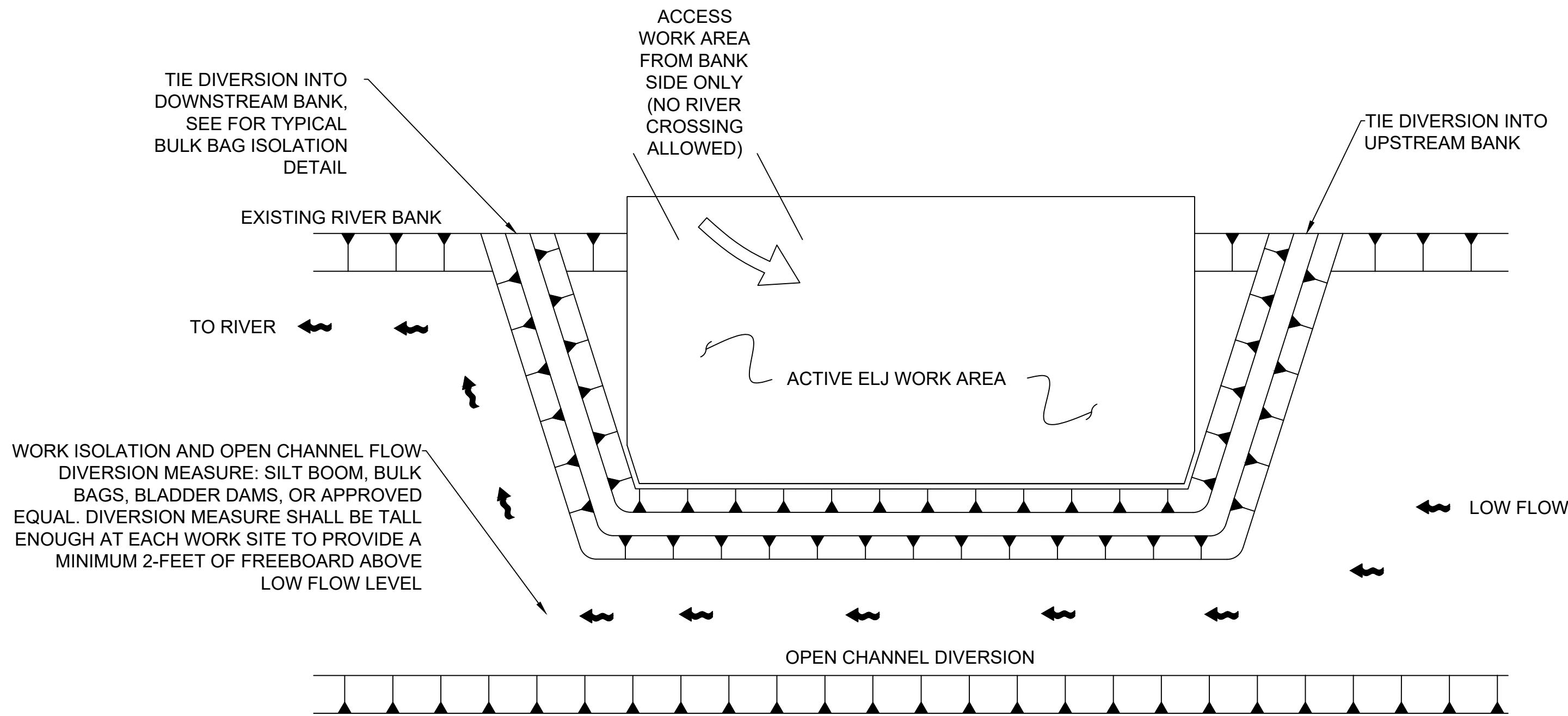


LOG SCHEDULE - ELJ 9:

LOG TYPE	MINIMUM DIAMETER (IN)	LENGTH (FT)	ROOTWAD	TOTAL QTY PER ELJ
R2	24+	40	YES	3
R3	24+	35	YES	14
R7	12-24	25	YES	2
R8	18-24	25	YES	6
R9	18-24	20	YES	1
R10	18-24	15	YES	1
L3	16-24	25	NO	1
L4	16-24	20	NO	8
RACKING	4-16	15-30	OPTIONAL	60
SLASH				120 CY

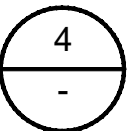
LOG SCHEDULE - ELJ 10:

LOG TYPE	MINIMUM DIAMETER (IN)	LENGTH (FT)	ROOTWAD	TOTAL QTY PER ELJ
R2	24+	40	YES	2
R3	24+	35	YES	9
R7	12-24	25	YES	6
R8	18-24	25	YES	7
L3	16-24	25	NO	2
L4	16-24	20	NO	4
RACKING	4-16	15-30	OPTIONAL	60
SLASH				120 CY



DETAIL - ELJ WORK AREA ISOLATION SCHEMATIC

SCALE: NTS



ELJ WORK AREA ISOLATION NOTES:

- DIVERSION OF WATER AND HANDLING OF STREAM FLOW WILL BE REQUIRED DURING CONSTRUCTION. THE PLANS ON THIS DRAWING SHOW A SUGGESTED METHOD FOR THE CONTRACTOR TO ROUTE WATER AROUND THE WORK SITE. ACTUAL SITE CONDITIONS MAY REQUIRE ADJUSTMENTS TO THE PLANS SHOWN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DEVELOPING AND SUBMITTING A TEMPORARY STREAM FLOW DIVERSION PLAN TO ALLOW CONSTRUCTION TO BE PERFORMED IN THE DRY.
- THE ACTUAL DIVERSION PLAN (BY THE CONTRACTOR) SHALL BE DESIGNED TO ALLOW PASSAGE OF STREAM FLOW WITHOUT OVERTOPPING THE UPSTREAM DAM. THE CONTRACTOR SHALL CHOOSE THE LEVEL OF PROTECTION.
- ANY DAMAGE TO THE WORK RESULTING FROM FAILURE OR INADEQUACY OF THE DIVERSION SYSTEM SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL NOT BE ENTITLED TO ANY ADDITIONAL PAYMENT FOR COSTS ASSOCIATED WITH FAILURE OF THE DIVERSION SYSTEM.

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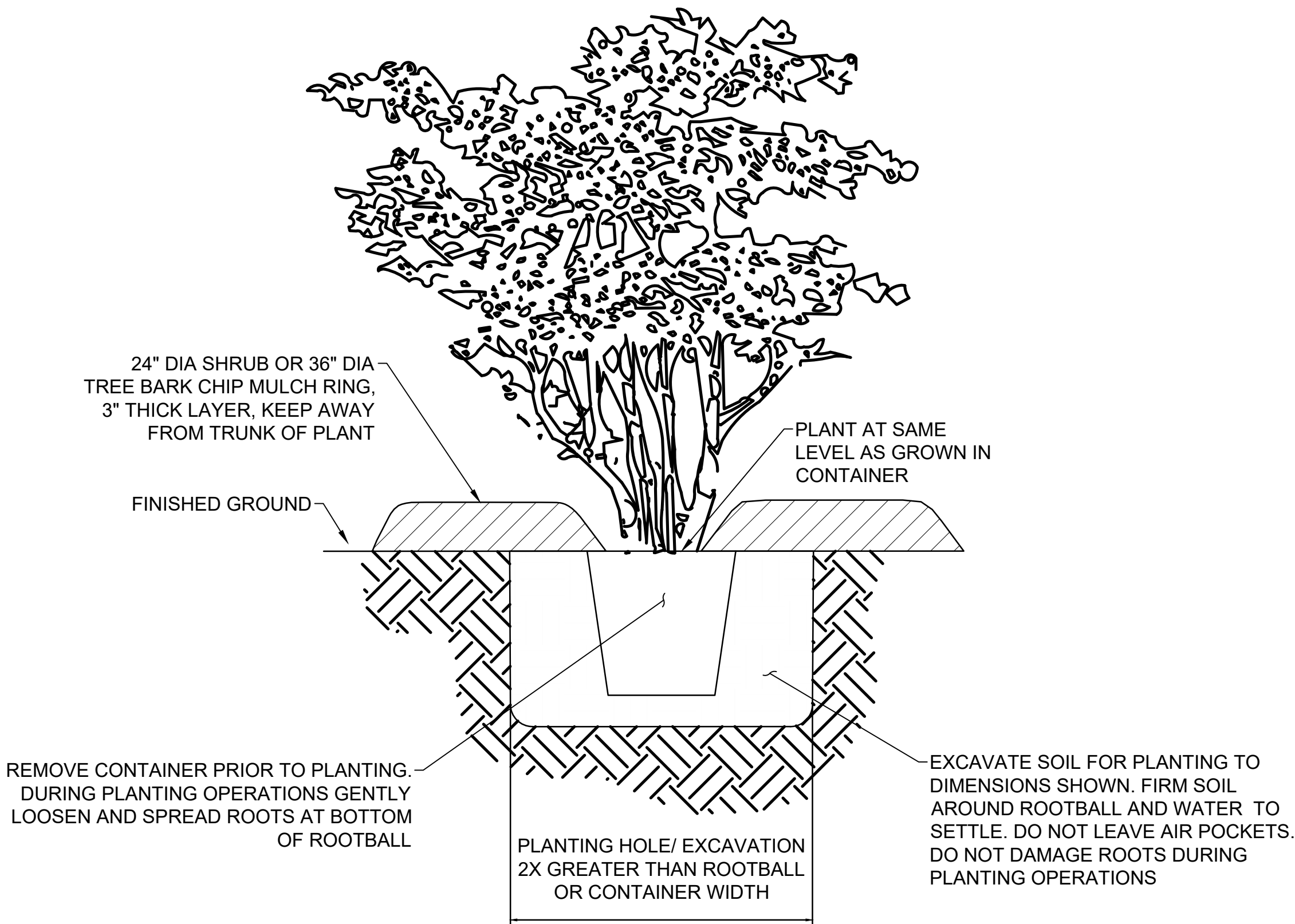
LAYERING DETAILS

C-10

REFERENCE NO:
APPLICANT:
PROPOSED PROJECT:
LOCATION:

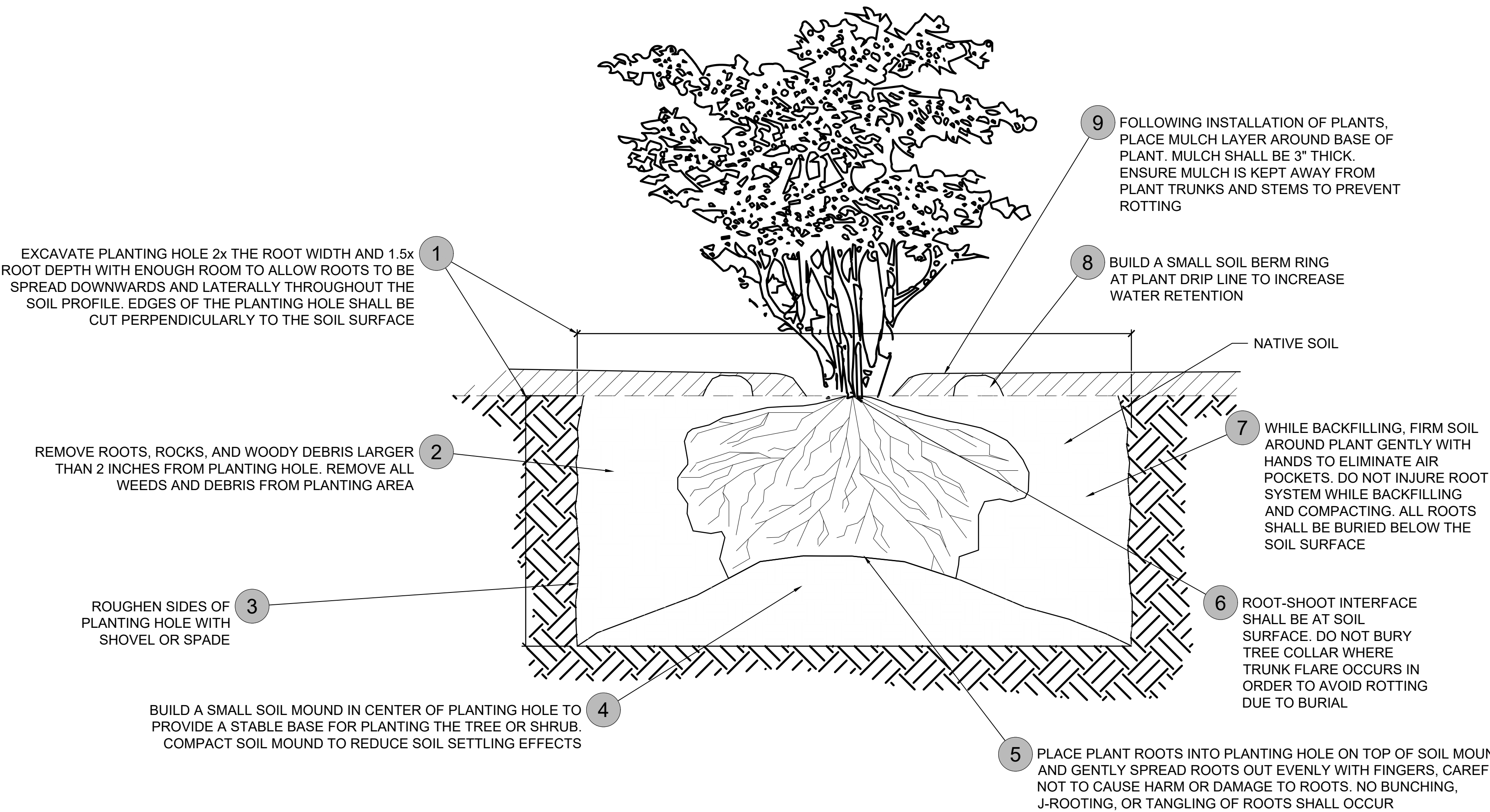
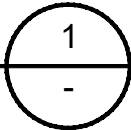
SNOHOMISH COUNTY PUD #1
CONSTRUCT 2 ELJS
NEAR 138TH PLACE SE

SHEET: 10 OF 11
DATE: JUNE 2026



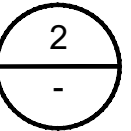
DETAIL - CONTAINER TREE AND SHRUB PLANTING

SCALE: NTS



DETAIL - BARE ROOT TREE OR SHRUB PLANTING

SCALE: NTS



PLANTING NOTES:

- REFER TO CRITICAL AREAS REPORT AND MITIGATION PLAN (HERRERA 2026) FOR LIST OF TOTAL PLANT SPECIES, SPACING, AND QUANTITIES.
- REMOVE ALL NON-NATIVE/INVASIVE SPECIES WITHIN THE PLANTING AREAS. REMOVE BLACKBERRY ROOTBALLS. DISPOSE OFFSITE.
- DECOMPACT THE PLANTING AREAS WHERE HEAVY EQUIPMENT WAS UTILIZED.
- INSTALL CONTAINER PLANTS BETWEEN FALL AND EARLY SPRING. BAREROOT STOCK MUST BE INSTALLED IN THE WINTER.
- KEEP BAREROOT PLANTS SHADED, COOL AND COVERED AT ALL TIMES PRIOR TO PLANTING. INSTALL LIVE STAKES DURING THE WINTER DORMANT SEASON.
- DO NOT INSTALL PLANTS BELOW THE ORDINARY HIGH WATER MARK.
- FLAG ALL INSTALLED PLANTS WITH BRIGHTLY-COLORED FLAGGING.

PLANT SPECIES, SIZE, AND SPACING FOR WETLAND AND RIPARIAN BUFFER

WETLAND - 1,310 SQUARE FEET

SPECIES	SIZE	ON-CENTER SPACING
RED-OSIER DOGWOOD (CORNUS SERICEA)	4 FOOT LIVE STAKE	2 FEET
SITKA WILLOW (SALIX SITCHENSIS)	4 FOOT LIVE STAKE	2 FEET
SLOUGH SEDGE (CAREX OBNUPTA)	9 INCH PLUG	1 FOOT

RIPARIAN BUFFER - 13,580 SQUARE FEET

SPECIES	SIZE	ON-CENTER SPACING
SITKA SPRUCE (PICEA SITCHENSIS)	2-GALLON POT	15 FEET
WESTERN REDCEDAR (THUJA PLICATA)	2-GALLON POT	15 FEET
BLACK COTTONWOOD (POPULUS BALSAMIFERA)	2-GALLON POT	15 FEET
BIG-LEAF MAPLE (ACER MACROPHYLLUM)	2-GALLON POT	15 FEET
RED ALDER (ALNUS RUBRA)	2-GALLON POT	15 FEET
VINE MAPLE (ACER CIRCINATUM)	1-GALLON POT	15 FEET
OCEAN SPRAY (HOLODISCUS DISCOLOR)	1-GALLON POT	6 FEET
OSOBERRY (OEMLERIA CERASIFORMIS)	1-GALLON POT	6 FEET
SALMONBERRY (RUBUS SPECTABILIS)	18-36" BARE ROOT STOCK	6 FEET
NOOTKA ROSE (ROSA NUTKANA)	18-36" BARE ROOT STOCK	6 FEET
COMMON SNOWBERRY (SYMPHORICARPOS ALBUS)	18-36" BARE ROOT STOCK	6 FEET
THIMBLEBERRY (RUBUS PARVIFLORUS)	18-36" BARE ROOT STOCK	6 FEET

HYDROSEEDING MIX FOR STAGING AREA IN BUFFER

SPECIES	%PLS OF MIX
YARROW (ACHILLIA MILLEFOLIUM)	20
SPIKE BENTGRASS (AGROSTIS EXARATE)	15
CALIFORNIA BROME (BROMUS CARINATUS)	10
TUFTED HAIRGRASS (DESCHAMPSIA CAESPITOSA)	5
BLUE WILDRYE (ELYMUS GLAUCUS)	15
NATIVE RED FESCUE (FESTUCA RUBRA VAR. RUBRA)	15
MEADOW BARLEY (HORDEUM BRACHYANTHERUM)	15
STERILE POCO BARLEY (HORDEUM VULGARE VAR.POCO)	5

SHANNON & WILSON



SNOHOMISH PUBLIC UTILITIES DISTRICT NO. 1
ATTN: MANAGER OF NATURAL RESOURCES
P.O. BOX 1107, EVERETT, WA 09201
PHONE: 425-783-1841

PLANTING SCHEDULE, NOTES AND DETAILS

C-11

REFERENCE NO:
APPLICANT:
PROPOSED PROJECT:
LOCATION:

SNOHOMISH COUNTY PUD #1
CONSTRUCT 2 ELJS
NEAR 138TH PLACE SE

SHEET: 11 OF 11
DATE: JUNE 2026