

This page is intentionally left blank.



Ecosystems Technical Analysis Methodology

May 2020



This page is intentionally left blank.

1 INTRODUCTION

This Ecosystem Resources Technical Analysis Methodology memorandum briefly describes the methods that will be used to prepare the Ecosystem Resources element of the West Seattle and Ballard Link Extensions project Environmental Impact Statement (EIS). The ecosystems analysis will identify and document potential long-term operational and short-term construction impacts to wetlands, threatened and endangered species, vegetation, wildlife habitat, wildlife, and aquatic species and habitat.

2 GUIDING REGULATIONS, PLANS, AND POLICIES

In addition to the relevant regulations considered in all environmental analyses, the following will also be considered:

2.1 Federal

- Sections 404, 402, and 401 of the Clean Water Act (CWA)
- Section 7 of the Endangered Species Act (ESA)
- Magnuson-Stevens Fishery Conservation and Management Act (MSA)
- Marine Mammal Protection Act
- Bald and Golden Eagle Protection Act
- Migratory Bird Treaty Act (MBTA)
- Protection of Wetlands, Presidential Executive Order 11990
- Final Rule on Compensatory Mitigation for Losses of Aquatic Resources (2008 or as revised)
- Corps of Engineers Wetland Delineation Manual (1987)
- Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region Version 2.0 (2010)
- Coastal Zone Management Act

2.2 State

- Hydraulic code (Washington Administrative Code [WAC] Chapter 220-110)
- Shoreline Management Act (SMA)

- Protection of Wetlands, Governor's Executive Order (EO) 89-10
- Protection of Wetlands, EO 90-04
- Water Pollution Control Act, 90.48 Revised Code of Washington (RCW)
- Wetland Mitigation in Washington State (Ecology et al., 2006)

2.3 Local

- Critical Area Ordinances (CAOs) City of Seattle Municipal Code Chapter 25.09,
 Regulations for Environmentally Critical Areas
- City of Seattle Municipal Code Chapter 23.60A, Seattle Shoreline Master Program Regulations
- City of Seattle Municipal Code Chapter 25.11, Tree Protection
- City of Seattle, Department of Construction and Inspections, Director's Rule 16-2008, Designation of Exceptional Trees
- City of Seattle Executive Order 03-05, Tree Replacement
- City of Seattle, Department of Construction and Inspections, Director's Rule 13-2018, Great Blue Heron

2.4 Miscellaneous

- King County In-Lieu Fee Mitigation Program (King County, 2018)
- Sound Transit environmental and sustainability plans and policy (Sound Transit, 2018)
- Sound Transit Sustainability Plan Update (Sound Transit, 2015)
- Sound Transit Stream Assessment Guidelines (Sound Transit, 2016)
- Sound Transit Executive Order Number 1: Establishing a Sustainable Initiative (Sound Transit, 2007)

3 DATA NEEDS AND SOURCES

Data needs for this resource include information on ecosystems resources that will be affected by the construction and operation of the project, including the project footprint and mitigation sites. Data needs and sources that should be considered include:

- Natural Resources Conservation Service (NRCS) Web Soil Survey maps
- U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI)

- USFWS List of threatened and endangered species that may occur in proposed project location (obtained for project)
- National Oceanic and Atmospheric Administration (NOAA) Fisheries Endangered Species Act species lists
- Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species (PHS)
 data
- WDFW SalmonScape data
- Washington Natural Heritage Program rare plant database
- Washington State Department of Ecology 303(d) listed waters information
- Washington Department of Fisheries catalog of Washington streams and salmon utilization (Williams et al., 1975)
- King County parcel information
- City of Seattle Department of Construction & Inspections environmentally critical areas geographic information system (GIS) data
- · City of Seattle street tree inventory GIS data
- Documented wetlands from other projects

4 STUDY AREA AND AREA OF EFFECT

The study area for ecosystem resources will vary according to the type of resource and will be measured from the project footprint and area used for construction.

- Wetlands: 300 feet from project limits.
- Vegetation: 200 feet from project limits and any regulated trees (as defined per jurisdiction).
- Wildlife and wildlife habitat: 200 feet from project limits. Also review documented occurrences of sensitive wildlife species within 0.25 mile of the project limits (0.5 mile if higher noise sources such as blasting or pile driving are proposed).
- Aquatic resources: Reconnaissance-level aquatic habitat surveys will be conducted for aquatic habitats within the City of Seattle's Shoreline District, including the Duwamish Waterway and Salmon Bay. Reconnaissance-level aquatic habitat surveys will be conducted 300 feet downstream, 100 feet upstream at each of the water body crossings, and the entire stretch of any water body paralleling the project within 200 feet from the edge of the project

limits. The survey may extend to 300 feet upstream if channel configuration could result in stream buffers overlapping the project limits. For streams or water bodies with ESA listed species, the study area includes at least the segment of stream or water body that sound could travel in water (i.e., to first bend in the channel or where noise would dissipate to background levels). If project-related underwater sound could potentially travel further than these distances, the longer distance will be surveyed.

5 AFFECTED ENVIRONMENT

5.1 Field Reconnaissance Survey Methodology

After collecting and reviewing existing information, the biologists will conduct a detailed field reconnaissance survey within the study area to identify and confirm ecosystem resources that could be affected by the project. Formal delineations (flagging and professional land surveying) of wetlands, ordinary high water mark (OHWM), or other resources will generally not be conducted, but may be needed on a case-by-case basis.

5.1.1 Wetlands

A field survey will be conducted to identify, map, and describe wetlands and other waters within the study area. Field surveys will occur on publicly owned property (e.g., Longfellow Creek greenspace and Southwest Queen Anne greenbelt) and private properties, if accessible. Vegetation, soil, and hydrology conditions will be documented at representative locations (sample plots) using methods outlined in the U.S. Army Corp of Engineers (USACE) Wetland Delineation Manual (USACE, 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region Version 2.0 (USACE, 2010). These sample plots will be identified in the field with labeled flagging and documented using a global positioning system (GPS) unit or survey techniques. Both wetland and upland sample plots will be documented. The wetland and upland sample plots need to be paired and within close proximity to each other. If a wetland contains multiple vegetation types (e.g., forested and scrub/shrub), at least one wetland sample plot will be located in each vegetation type. A minimum of two wetland determination data forms will be developed for each wetland and then an additional data form for each additional wetland vegetation type in the study area. Observations of existing conditions and characteristics will be recorded for each wetland and associated buffer.

Wetlands will be classified according to the USFWS (Cowardin et al., 1979; FGDC 2013) and hydrogeomorphic (Brinson, 1993) classification systems and rated according to local jurisdiction critical area ordinances and the Washington State Wetland Rating System for Western Washington (Hruby, 2004) or the 2014 Update (Hruby, 2014), depending upon the affected jurisdiction. Wetlands will be classified and rated according to local critical area requirements. Wetland functions will be evaluated through the use of the Washington State Wetland Rating System for Western Washington – 2014 Update, as well as WSDOT's Wetland Functions Characterization Tool for Linear Projects (Null et al., 2000).

Wetland assessments will provide estimates of extent for all wetlands and other waters in the study area, including those on properties lacking access, using remote sensing and best professional judgment. Vegetation and potential wetlands for areas where rights of entry have

not been obtained will be identified based on field reconnaissance from public areas; current local, state, and federal habitat maps and reports; and the examination of aerial photographs. Potential wetlands will be rated using these same sources of information. Where specific information is not known (such as the hydrologic regime), preliminary assessments will be made using available information.

Those areas that appear to possess all three wetland indicators will be included in the EIS and technical report in order to provide a conservative estimate of potential impacts from each alternative. Documented wetlands from other projects or sources will be evaluated and, where appropriate, included in the wetland findings. Each wetland identified in the study area will receive a unique identifier that will be tracked in a GIS database. As new information is collected on project wetlands, data will be recorded in an Excel spreadsheet that will be linked to the GIS data. Wetland names will start with the letter "W" and the next two letters will be based on the City of Seattle jurisdiction they are located in (Seattle = SE) followed by a number reflecting the order encountered in the field (1, 2, 3, etc.). For example, Wetland WSE4 would be the fourth field-identified wetland in Seattle.

5.1.2 Aquatic Species and Habitat

The aquatic species and habitat assessment will focus on key habitats and aquatic features that may be impacted by the project and that are directly related to ecological functions that support aquatic ecosystems. Similar to wetlands, a detailed field reconnaissance survey will be conducted to identify, map, and describe aquatic species and habitat within public rights-of-way within the study area (e.g., Longfellow Creek riparian corridor). These documented water bodies will be included in the EIS aquatic species and habitat findings. The descriptions will correlate with the Water Resources analysis.

Sound Transit's Stream Habitat Assessment Guidelines (Sound Transit, 2016) (Attachment A) will be used to determine the level of information that should be collected for each identified stream. In accordance with the stream habitat assessment guidelines, research and field surveys will be conducted to identify, map, and describe aquatic species and habitats within the study area. This project will utilize the Phase 1 Project approach (planning level study) to provide analysis for SEPA/NEPA and ESA coordination. Within the Phase 1 approach, the project will use Track A methods for assessing riparian vegetation effects where property access is not granted, and Track B methods on Sound Transit, WSDOT, or City of Seattle right-of-way/easement areas. General information will be collected in the field and stream OHWM will be estimated and mapped using a GPS unit if possible. Biologists will collect information about the condition of in-stream and riparian habitats and identify the OHWM of streams.

Field assessment will be limited to areas accessible from public right of way, lands open to the public, and other lands where access is allowed (including private property where the property is accessible) for purposes of this survey. Aquatic habitats outside of public rights-of-way will be identified based on field reconnaissance from public areas; current local, state, and federal habitat maps and reports; and the examination of aerial photographs. Those areas outside of public rights-of-way and which are not open to the public or accessible that appear to be aquatic habitat will be included in the EIS findings to provide a conservative estimate of the potential impacts for each alternative.

Background information about riparian vegetation, physical in-stream habitat, biological connectivity, water quality and quantity, stream typing, and fish presence and habitat use will be collected during the pre-field review phase. Additionally, aquatic species habitat will be

described, when possible and applicable, in a sub-basin context. Habitat will be assessed with the assumption that anadromous fish may one day be able to access the area even if they cannot under present conditions where no natural barriers exist. To the extent information is currently available or can be readily ascertained in the field, downstream fish passages, including any impediments to fish passage, will be evaluated for each identified aquatic habitat. Field observations will be limited to the study area, however, available information (like the WDFW SalmonScape map) would be used to evaluate downstream fish passage to the next fish-bearing stream.

Each stream identified in the study area will receive a unique identifier that will be tracked in aGIS database. As new information is collected on project streams, data will be recorded in an Excel spreadsheet that will be linked to the GIS data. If a stream already has a formal name, it will be used. Unnamed stream names will start with the letter "S" and the next two letters will be based on the City of Seattle jurisdiction they are located in (Seattle = SE) followed by the order they are encountered in the field (1, 2, 3, etc.). For example, Stream SSE2 would be the second field-identified stream in Seattle. Other types of aquatic habitat (lakes, ponds, bays, waterways, etc.) will be identified by formal name, if available, or named in a system similar to the stream naming convention described above.

5.1.3 Vegetation, Wildlife, and Wildlife Habitat

To establish the basis for the analysis of effects on vegetation, wildlife, and wildlife habitat, the biologists will delineate and classify land cover on aerial photographs and visit a sample of these areas within the study area (including the Shoreline Districts) during the field reconnaissance survey. Information from Green Cities Alliance, Forterra, or other existing land cover analyses may be incorporated into the vegetation assessment if readily available. Major plant communities/habitat types will be identified and classified based on the structural categories defined in Wildlife-Habitat Relationships in Oregon and Washington (Johnson and O'Neil, 2001). Heritage and exceptional trees as defined by the City of Seattle will be noted and included in the analysis. Invasive species populations that have been mapped by King County iMap will be included in the analysis.

To support the analysis of effects on wildlife, the biologists will identify wildlife species that are associated with the land cover types in the study area, and with specific habitat elements within each cover type. Biologists will also assess locations of known ecologically sensitive areas and important wildlife occurrences that may be sensitive to disturbance from noise or human presence. This will include review of site-specific wildlife data, including bird surveys (e.g., eBird 2018). This information will be supplemented with data gathered during field visits.

Washington State Department of Natural Resources (DNR) Natural Heritage Program and WDFW publications will be used to identify important habitats and the wildlife species that use them. Vegetation data, including dominant plant species composition and relative abundance, will be gathered and classified by habitat type using field observation, aerial photographs, and pertinent literature. Maps will be developed showing plant communities/habitat types and special features, based on the habitat delineation exercise described above. Invasive species noted during fieldwork will be discussed qualitatively but will not be mapped. GIS data from the WDFW PHS program will be used to generate maps of the distribution of priority habitats and species, and other key ecological features needed to analyze impacts. DNR Natural Heritage Program data will also be used to identify rare plant populations in the study area. Sensitive information regarding the locations of proposed, candidate, and listed species and habitats will

be described but not mapped to protect the integrity of this information. Threatened and endangered species and critical habitat tables will be generated using the latest data provided on the USFWS and NOAA Fisheries web sites.

5.1.3.1 Great Blue Heron

The City of Seattle has mapped great blue heron management areas in two greenspaces in the West Seattle segment of the project: Camp Long - Longfellow Creek Greenspace, and the West Duwamish Greenbelt. WDFW's Priority Habitat Species also documents great blue heron in the Camp Long - Longfellow Creek Greenspace and the West Duwamish Greenbelt. Presence of a heron rookery near the project corridor was confirmed in 2018. This habitat in the Longfellow Creek Greenspace and the West Duwamish Greenbelt will be resurveyed in 2019. Previously mapped areas and the results of the 2018 and 2019 surveys will be documented. Monitoring of the West Duwamish Greenbelt will be conducted annually throughout the EIS phase to confirm bird activity in the project area.

5.1.3.2 Bald Eagle

The City of Seattle has mapped a bald eagle management area in the West Duwamish Greenbelt. No nests were identified near the project corridor during a 2018 survey. Suitable habitat in the West Duwamish Greenbelt will be resurveyed in 2019. Previously mapped areas and the results of the 2018 and 2019 surveys will be documented. Monitoring of the West Duwamish Greenbelt will be conducted annually throughout the EIS phase to assess whether bald eagles are nesting in the greenbelt.

6 ENVIRONMENTAL IMPACT ANALYSIS

The impact analysis will assess the potential direct, indirect, and cumulative ecosystem impacts of the project alternatives, including the No Build alternative. The impacts analysis is divided into long term operation impacts and short-term construction impacts. The impact analysis will describe the extent, magnitude, duration, and character of impacts on ecosystem resources for each alternative. Impacts will be quantified where appropriate and possible (e.g., area of wetland impacts).

6.1 Direct Impacts

Impacts on wetlands and buffers will be described based on direct impacts from both long-term effects (filling or other permanent displacement) and short-term construction-related effects (including effects associated with construction staging areas). If a contiguous wetland lies partially within the project limits, then best professional judgment will be used to determine any project effects, as defined by Wetland Mitigation in Washington State (Ecology et al., 2006), on the portion of the wetland outside of the project limits. If the remaining wetland is degraded by project construction or operation, then its acreage will be included in the impact table. The impact table will quantify the expected direct impacts on each wetland resulting from each alternative. Functional effects that extend beyond the area of direct wetland impacts will also be assessed.

Direct impacts on aquatic species habitat will be determined by evaluating the acreage of each water body and riparian buffer that would be eliminated for each alternative. Direct impacts on

aquatic species will be assessed qualitatively by considering such factors as the regional significance of the resident and anadromous fish species resource, fish habitat value (such as its role as a migration corridor or spawning), degree of connectivity and loss of habitat following project implementation, overall habitat quality, and potential for enhancing or restoring aquatic habitat or connectivity. Construction and operational impacts on aquatic species from water quality degradation, loss of habitat, shading, and habitat degradation will also be assessed.

Direct impacts on vegetation and wildlife habitat will be determined by evaluating the acreage of each major vegetation type that would be eliminated for each alternative. Impacts will also be assessed qualitatively by considering such factors as the regional significance of the resource, wildlife habitat value (such as its role as a wildlife movement corridor), degree of fragmentation and loss of the habitat following project implementation, overall habitat quality, and the potential for enhancing or restoring unique plant communities or wildlife habitat or connectivity. Construction and operational impacts on wildlife, including disturbances from increases in human access, noise, and light, will also be assessed. Direct impact on rare plant populations will be determined by evaluating acreage of these populations that would be eliminated for each alternative. Additionally, the biologists will analyze the potential for the project to cause the spread of noxious or invasive plant species.

Potential direct impacts to be considered for threatened and endangered species (aquatic and terrestrial) include direct mortality, disturbance and displacement effects, and loss or degradation of habitat. This could require consultations with NOAA Fisheries and USFWS under ESA Section 7 as the project approaches the Final EIS. The Biological Assessment (BA) would be prepared as the Final EIS is initiated, following the identification and/or confirmation of the preferred alternative and the results of the preliminary engineering efforts focused in the preferred alternative. Consultation with the agencies will be coordinated through Sound Transit's ESA Coordinator throughout the environmental review process. Information received from the existing documents, field surveys, and agency consultation could identify habitats or areas to be avoided or protected. Impact avoidance is discussed in greater detail in the Mitigation Measures section.

6.2 Indirect Impacts

Indirect impacts are potential effects that would be caused by the project alternatives at a later time or farther distance but are still reasonably foreseeable. These may include effects related to station area developments by others, such as changes in the pattern of land use, population density, or water quality through the project. Indirect impacts may also occur through the implementation of mitigation measures for other environmental impacts, or through supporting projects that are not yet defined or considered part of the project alternatives. Indirect impacts on ecosystem resources will be analyzed qualitatively.

6.3 Cumulative Impacts

The total effects of the project on ecosystem resources will be determined by combining the project's impacts with other past, present, and reasonably foreseeable future actions. These actions include other transportation or infrastructure projects, or other planned or pending land use actions or developments in the study area.

7 MITIGATION MEASURES

Potential impacts to ecosystem resources will be controlled through project planning, design, and the application of required best management practices (BMPs) during construction and operation. Measures to avoid and minimize potential impacts of the alternatives will be incorporated as appropriate. Where impacts cannot be avoided or minimized, mitigation measures will be developed.

The project will use a mitigation sequencing approach based on a hierarchy of avoiding and minimizing adverse impacts through careful design, rectifying temporary impacts, and compensating for unavoidable adverse impacts. A listing of BMPs will be developed identifying measures that could be implemented to avoid or reduce adverse impacts on ecosystem resources during construction and operation. Potential mitigation will be identified and evaluated for project locations where adverse impacts could occur. Advanced mitigation, mitigation banks, and in-lieu fee programs that Sound Transit could propose to use for compensatory mitigation will also be included in the review of mitigation opportunities. Mitigation measures will include specific goals and objectives and will specify monitoring criteria against which proposed mitigation measures can be compared. Conceptual mitigation measures will be generally described in enough detail so that reviewing agencies can determine the likelihood of the proposed mitigation succeeding and meeting all stated objectives, including providing compensation for unavoidable impacts so there is no net loss of area and/or function.

The final EIS will include a summary of conservation measures from the Endangered Species Act consultation with the USFWS and NOAA Fisheries.

8 PROPOSED FIGURES, MAPS, OR OTHER DATA

Maps of vegetation land cover, wetlands, water bodies, and high-value habitat will be prepared.

9 DOCUMENTATION

An Ecosystems Technical Report will be prepared with chapters covering wetland resources, aquatic resources, wildlife, and vegetation.

The wetland chapter of the report will contain field data sheets and labeled photos that will be indexed on segment maps. Each photo will be catalogued with location and other basic information such as date and direction of view to assist Sound Transit in initiating preliminary consultation with the U.S. Army Corps of Engineers, Washington State Department of Ecology, and local jurisdictions for wetland permitting.

The aquatic resources chapter of the report will characterize existing aquatic conditions in Duwamish Waterway and Salmon Bay (including field data sheets and photographs) and will detail elements for species and habitats of concern within the project area, including threatened and endangered species, critical habitat, and essential fish habitat (EFH) that would typically be addressed in the BA. The effects on these resources will be noted for each alternative and mapped (confidential if concerning threatened and endangered species). All official correspondence will be incorporated into an appendix.

The wildlife and vegetation chapter of the report will characterize existing terrestrial conditions and will also include species and habitats of concern, including threatened and endangered species that would typically be included in the BA.

An Ecosystem Resources EIS section will be prepared summarizing the Ecosystems Technical Report.

Unless required otherwise by the resource agencies, one BA will be prepared during the Final EIS for the preferred alternative only. The BA will address species concerning both NOAA Fisheries and USFWS in one document. The BA will follow Sound Transit's Biological Assessment Template (current version) as well as ESA, USFWS, and NOAA Fisheries requirements. The BA (if required) will summarize the proposed action, describe the habitat requirements and life history of the listed species, evaluate whether suitable habitat exists at or near the site, present information regarding the actual occurrence of listed species at or near the site, and describe potential impacts of the proposed action (construction and operation) on listed species and habitats at or near the site. Proposed conservation measures intended to avoid or reduce potential impacts on listed species will be described in enough detail to enable USFWS and NOAA Fisheries to determine whether the proposed conservation measures will likely succeed and meet all stated objectives of avoiding and minimizing potential impacts. An effects determination will be made for each species and any designated critical habitat potentially affected by the project.

A separate wetland delineation report will be prepared for the preferred alternative during the Final EIS. It will include a list and map of properties that could not be delineated due to lack of property access.

10 DATA DEVELOPED FOR USE BY OTHER DISCIPLINES

Data gathered on ecosystems impacts may be used in the following analyses:

- Water Resources
- Land Use
- Visual and Aesthetic Resources
- Park and Recreational Resources
- Environmental Justice

11 REFERENCES

Brinson, M.M. 1993. A Hydrogeomorphic Classification for Wetlands. Wetlands Research Program Technical Report WRP-DE-4. U.S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, MS.

Cowardin, L.M., V. Carter, F C. Golet, E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. FWS/OBS-70/31, U.S. Fish and Wildlife Service, Washington, DC.

eBird. 2018. eBird: An online database of bird distribution and abundance [web application]. eBird, Ithaca, New York. Available: http://www.ebird.org.

Ecology (Washington State Department of Ecology), U.S. Army Corps of Engineers Seattle District, and U.S. Environmental Protection Agency Region 10. 2006. Wetland Mitigation in Washington State – Part 1: Agency Polices and Guidance (Version 1). Washington State Department of Ecology Publication #06-06-011a. Olympia, WA.

Environmental Laboratory. 1987. Corps of Engineers wetland delineation manual. Technical Report Y-87-1, Environmental Laboratory, Department of the Army, Waterways Experiment Station, Vicksburg, MS.

ESA Adolfson. 2010. Sound Transit 2 Mitigation: Impact Summary and Analysis Memorandum. December 3, 2010. Prepared for Sound Transit. Seattle, WA.

FGDC (Federal Geographic Data Committee). 2013. Classification of Wetlands and Deepwater Habitats of the United States. FGDC-STD-004-2013. Second Edition. Wetlands Subcommittee, Federal Geographic Data Committee and U.S. Fish and Wildlife Service, Washington, DC.

Hruby, T. 2014. Washington State wetland rating system for Western Washington –2014 update. Washington State Department of Ecology Publication #14-06-029. Olympia, WA.

Hruby, T. 2004. Washington State wetland rating system for Western Washington –Revised. Washington State Department of Ecology Publication #04-06-025. Olympia, WA.

King County. 2018. Mitigation Reserves Program website. https://www.kingcounty.gov/services/environment/water-and-land/wetlands/mitigation-credit-program.aspx.

Johnson, D.H. and T.A. O'Neil (managing directors). 2001. Wildlife-habitat relationships in Oregon and Washington. Oregon State University Press, Corvallis, OR.

Null, W.S., G. Skinner, and W. Leonard. 2000. Wetland Functions Characterization Tool for Linear Projects. Washington State Department of Transportation, Environmental Affairs Office, Olympia, Washington.

Reppert, R. T., Sigleo, W., Stackhiv, E., Massman, L., Meyers, C. 1979. Wetland Values: Concepts and Methods of Wetland Evaluation. IWR Res. rep. 79-R-1, U.S. Army Corps of Engineers, Fort Belvoir, Virginia.

Sound Transit. 2015. Sound Transit Sustainability Plan 2015 Update. https://www.soundtransit.org/sites/default/files/documents/pdf/about/environment/20150122_sustainabilityplan.pdf. January.

Sound Transit. 2016. Sound Transit Stream Habitat Assessment Guidelines.

Sound Transit. 2007. Establishing a Sustainable Initiative. https://www.soundtransit.org/sites/default/files/documents/pdf/about/environment/executiveorder no1_sustainability.pdf

U.S. Army Corps of Engineers. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0). U.S. Army Engineer Research and Development Center, Vicksburg, MS.

Washington State Department of Ecology, U.S. Army Corps of Engineers Seattle District, and U.S. Environmental Protection Agency Region 10. 2006. Wetland Mitigation in Washington State – Part 1: Agency Polices and Guidance (Version 1). Washington Department of Ecology Publication #06-06-011a. Olympia, WA.

Washington Natural Heritage Program. 1997. *Endangered, Threatened & Sensitive Vascular Plants of Washington*. Washington Department of Natural Resources. http://www.dnr.wa.gov/ResearchScience/Topics/NaturalHeritage/Pages/amp_nh_products.aspx.

Williams, R.W., R.M. Laramie, and J.J. Ames. 1975. A catalog of Washington streams and salmon utilization, Volume 1, Puget Sound. Washington Department of Fisheries, Olympia, WA.



Attachment A

Sound Transit Stream Assessment Guidelines (2016)

This page is intentionally left blank.



STREAM HABITAT ASSESSMENT GUIDELINES

This page is intentionally left blank.

Table of Contents

1.	Introduct	tion		
2.	Using the Stream Assessment Flowcharts			
	1.1 Phase	1 Projects	3	
	1.2 Phase	2 Projects	5	
3.	Data Coll	lection for Key Aquatic Habitat Elements	8	
	1.3 Riparian Vegetation			
	1.3.1	Background Information	8	
	1.3.2	Track A Information	10	
	1.3.3	Track B Information		
	1.3.4	Track C Information		
	1.4 Physical In-Stream Habitat		11	
	1.4.1	Background Information		
	1.4.2	Track A Information	12	
	1.4.3	Track B Information		
	1.4.4	Track C Information		
	1.5 Biolog	zical Connectivity	14	
	1.5.1	Background Information		
	1.5.2	Track A Information	15	
	1.5.3	Track B Information	15	
	1.5.4	Track C Information	16	
	1.6 Water Quality and Quantity		16	
	1.6.1	Background Information	16	
	1.6.2	Track A Information	16	
	1.6.3	Track B and C Information	16	
	1.7 Fish P	17		
	1.7.1	Background Information		
	1.7.2	Track A Information	17	
	1.7.3	Track B Information		
	1.7.4	Track C Information	19	
4.	Considera	ations and Limitations	19	
Rα	ferences		21	



SOUND TRANSIT STREAM HABITAT ASSESSMENT GUIDELINES

1. Introduction

Sound Transit projects often intersect with and affect streams. To comply with local, state, and federal rules and regulations, Sound Transit assesses stream conditions, determines stream impacts that will occur as a result of a project, and mitigates those impacts as appropriate. The analytical methodologies used and level of detail needed to meet these requirements depends on a variety of factors including: 1) the stage of project development and complexity of the project, 2) the extent to which Sound Transit has property access to streams, and 3) the magnitude of impact. Less detailed information is typically collected during planning and early design stages such as during SEPA/NEPA environmental review and preliminary engineering because rights-of-entry are not granted onto privately owned properties, thus restricting access to streams. Also, at this stage, multiple alternative alignments may be under consideration, making more labor-intensive field investigations less feasible from the standpoint of cost and time. At later stages of project development, once the project to be built is selected or final design is underway, more detailed analyses may be appropriate depending on access, the magnitude of potential impacts, and the types of environmental permits that may be necessary to construct the project.

Various methodologies exist on how to approach stream assessments in Washington and no one methodology is required, or is applicable to all projects or to all stages of project development. In addition, Native American tribes with fishing rights often request specific information about the effects of a project on both existing fish use and potential fish use of a stream. In this context, Sound Transit seeks to achieve greater consistency in how it approaches the assessment of streams at various stages of project development and under various conditions. The purpose of this document is to establish general guidelines for applying various stream assessment methods to Sound Transit projects based on the most commonly used methodologies in Washington. The information presented herein is for guidance only and is based on some of the most common scenarios encountered on Sound Transit projects. Sound Transit recognizes that other scenarios are possible and that professional judgment will be necessary when considering the best approach for specific projects. Proper application of professional judgment may reduce the collection of extraneous information, and reduce project effort and expense. The intent of these guidelines is to provide some level of consistency in Sound Transit's approach to assessing streams so that local, state, and federal regulators generally know what to expect during project reviews.

For the purposes of this document, project development is categorized into two phases: the initial environmental review and preliminary engineering phase (Phase 1) and the permitting/final design phase (Phase 2). These are further described below:

- Phase 1 Projects Planning stage that includes environmental review under SEPA/NEPA and conceptual and preliminary design. At this stage, various alignments or sites may initially be under consideration, and Sound Transit may or may not have rights-of-entry to the properties being evaluated. In general, objectives at this stage of project development are to:
 - 1) Identify streams within the study area
 - 2) Characterize in-stream and riparian conditions (including fish use and barriers to fish use of the stream) based on readily available information and visual observations as possible

- 3) Determine potential impacts to streams for the alternative(s) under consideration during the environmental review process, and
- 4) Identify conceptual-level mitigation opportunities for impacts to streams (aquatic and riparian habitats).

Phase 1 projects may include Endangered Species Act consultation, with the overall objective of being able to make and support accurate effect determinations for federally listed aquatic species potentially occurring in affected streams. Phase 1 of Sound Transit's project development culminates with completion of the NEPA/SEPA environmental review process and Sound Transit's selection of a specific project alternative to build.

• Phase 2 Projects – Final project design stage that includes environmental permitting and detailed mitigation to address project-related impacts to streams. At this stage, full access is typically available for the project. The overall objective is to secure necessary environmental permits/approvals including but not limited to local critical areas permits, a Hydraulic Project Approval (HPA) from the Washington Department of Fish and Wildlife (WDFW), a Clean Water Act Section 404 permit from the United States Army Corps of Engineers (Corps), and a 401 Water Quality Certification or Coastal Zone Management Consistency Determination from the Washington State Department of Ecology (Ecology).

Section 2 of this guidance document, **Using the Stream Assessment Flowcharts**, helps guide the reader in determining the appropriate level of data collection during the two project phases described above. To do this, a flowchart has been created for Phase 1 and Phase 2 projects, taking into account various project variables. The flowcharts and overview of how to use them are provided in Section 2. The flowcharts in Section 2 are supported by additional tools and more detailed information on various methodologies described in **Section 3 - Data Collection for Key Aquatic Habitat Elements**. Both Section 2 and Section 3 are organized around five stream features, referred to as Key Aquatic Habitat Elements and described below.

General recommendations for the appropriate use of these guidelines, as well as a discussion of their limitations, are provided in **Section 4 - Considerations and Limitations**.

2. Using the Stream Assessment Flowcharts

The flowcharts should be used to determine the appropriate data needs and level of field assessment that will be required for a project. Working through the flowcharts with site specific information will require the collection of qualitative and/or quantitative information on various Key Aquatic Habitat Elements. These elements are the key habitats and stream features that may be impacted by a project and are directly related to ecological functions that support a stream ecosystem. The Key Aquatic Habitat Elements are:

- riparian vegetation,
- physical in-stream habitat,
- biological connectivity,
- water quality and quantity, and
- fish presence, fish habitat use, and stream typing.

Information would be gathered during site visits or collected using specific survey techniques. The various "levels" of data collection for each Key Aquatic Habitat Element have been classified into one of three categories, or "Tracks". Tracks A, B, and C represent an increasing level of detail for data collection and generally correlate to the phase of the project, the extent to which access is available, and/or the magnitude of

stream impact.

2.1 Phase I Projects

Figure 1 on page 4 is the stream assessment flowchart for planning-level projects. It shows the general process to follow when considering potential stream impacts associated with Phase 1 projects. For all Phase 1 projects that include stream habitats, regardless of access or impact level, the first step is to collect background information on each of the Key Aquatic Habitat Elements associated with each stream in the study area. To help guide these efforts, see **Section 3 – Data Collection for Key Aquatic Habitat Elements**. Section 3 includes more detailed information on specific data sources to consult when collecting this information. The information gathered will help form the basis of the *Existing Conditions* or *Affected Environment* section of the environmental document being prepared for the project.

After collecting background information, some level of data should also be collected in the field. The data collected and the stream assessment methods used will vary for Phase 1 projects depending on 1) whether or not impacts are anticipated impact, and 2) whether or not the project team has right-of-entry to parcels that contain streams.

If access is limited, Track A Methods should be used for each Key Aquatic Habitat Element to the extent feasible. Areas where access to streams is not limited include existing Sound Transit right-of-way, WSDOT right-of-way, or other publicly-owned rights-of-way such as parks. In these areas, the project team should consider the anticipated level of impact to each Key Aquatic Habitat Element. The level of analysis required for a given Key Aquatic Habitat Element should be commensurate with the potential for impacts at a given site. In order to appropriately size the analysis, the flowchart requires consideration of whether or not impacts are expected to occur within the stream environment, looking in turn at each of the Key Aquatic Habitat Elements. For Phase 1 projects, a simple determination of either "Impact" or "No Impact" should be made for each Key Aquatic Habitat Element as presented in Table 1 (see page 5). The results of this analysis will help determine the level of data collection and analysis appropriate for each ecological function. If impacts are anticipated, the project study team should coordinate with Sound Transit environmental staff before initiating Track B data collection efforts as the data may already have been gathered by others or a shift in the project footprint may occur that negates the need to do more detailed surveys.

Depending on the outcomes from using the stream assessment flowchart for Phase 1 projects, various levels of data collection (either Track A or Track B) will need to be conducted. For information on specific stream habitat assessment methods to use under Track A or Track B, refer to **Section 3 – Data Collection for Key Aquatic Habitat Elements.** Tables 3 and 4 in that section outline pertinent assessment methods for each Key Aquatic Habitat Element, including detailed information on specific analysis metrics and survey methods that may be appropriate under Tracks A and B.

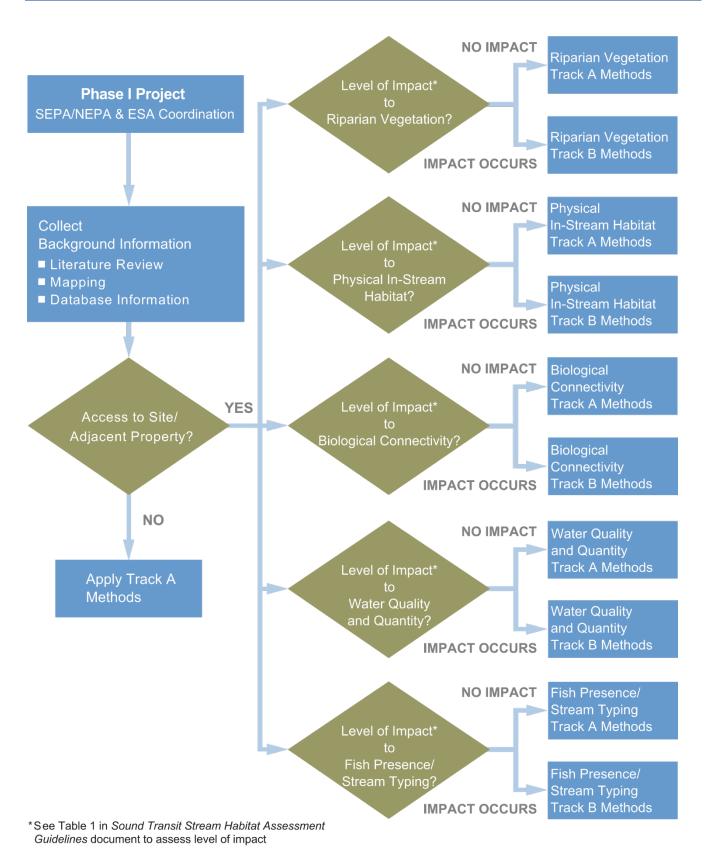


Figure 1
Stream Assessment Flowchart for Sound Transit Phase 1 Projects

Table 1 Impact Classification for Phase I Projects Based on Impacts to Key Aquatic Habitats

-	Impact Classification		
Key Aquatic Habitat Element	No Impact	Impact	
Riparian Vegetation	No clearing within riparian zone	Clearing riparian vegetation, OR Removing significant trees ¹	
Physical In-Stream Habitat	No in-water work or disturbance to bed and streambank below OHWM ²	Working in-water involving bank hardening, OR Installing fish habitat features (e.g., LWD³ or boulders), OR Altering substrate	
Biological Connectivity	No installation, removal, or alteration of culverts, bridges, weirs, or other potential passage barriers	Replacing or installing culverts, weirs, or bridges in non-fish bearing waters	
Water Quality and Quantity	No new stormwater discharges or increases in impervious surface	Adding new stormwater discharges or increasing impervious surface	
Fish Presence, Fish Habitat Use, and Stream Typing	No in-water or riparian impacts	In-water or riparian impacts occur	

¹ Significant trees should be defined using the local jurisdiction's Critical Areas and/or Urban Forestry code sections. If significant trees are not defined by local code, assume significant trees are those trees 6-inches or greater dbh (diameter breast height).

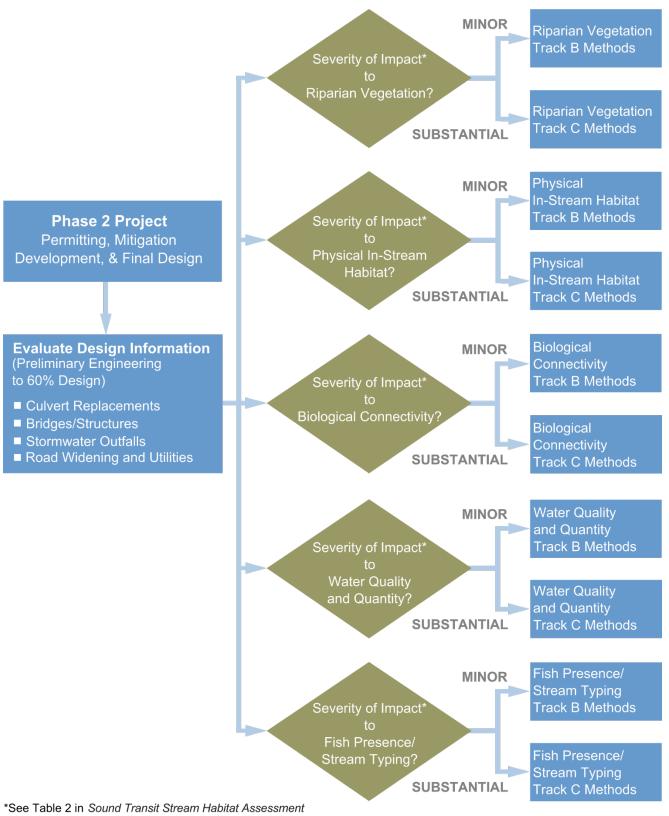
2.2 Phase 2 Projects

Figure 2 on page 6 is the stream assessment flowchart for projects in final design. It shows the general process to follow when assessing streams in greater detail for Phase 2 projects that involve stream impacts. For Phase 2 projects, access to all riparian areas is assumed for purposes of conducting field work using either Track B or Track C methods. In the unusual event that access to all parcels is not available during Phase 2, Track A methods should be used to the extent feasible.

Using more detailed project design drawings, the level of data collection for Phase 2 projects will vary depending on the severity of impacts to Key Aquatic Habitat Elements. For each stream impact area, impacts should be classified as either a "Minor Impact" or "Substantial Impact". Table 2 on page 7 should be utilized to help classify potential Phase 2 project impacts on each Key Aquatic Habitat Element, based on specific project activities and quantification of expected impacts to each habitat element. However, it should be noted that the criteria may be adjusted based on the relative severity of project impacts within each project area. The project study team should coordinate with Sound Transit environmental staff to confirm the impact classification and intended data collection track before initiating data collection, as some or all of the data may already have been gathered by others, or a shift in alignment may occur that negates the need to do more detailed survey.

² OHWM – ordinary high watermark

³ LWD – large woody debris



Guidelines document to assess level of impact

Figure 2 Stream Assessment Flowchart for Sound Transit Phase 2 Projects

Table 2 Impact Classification for Phase 2 Projects Based on Impacts to Key Aquatic Habitats

	Impact Classification		
Key Aquatic Habitat Element	Minor Impact	Substantial Impact	
Riparian Vegetation	Clearing less than 5,000 square feet of riparian vegetation, OR Removing 1 to 5 significant trees ^a	Clearing riparian vegetation in amounts exceeding minor impacts ¹	
Physical In-Stream Habitat	In-water work involving bank hardening of <20 linear feet, OR Installing fish habitat features (e.g., LWD ² or boulders), OR Altering substrate < 100 square feet	In-water work exceeding thresholds for minor impacts, OR stream straightening (meander loss) OR Site will be used as a compensatory mitigation site	
Biological Connectivity	Replacing or installing culverts or weirs in non-fish bearing waters	Replacing or installing culverts, fishways, or weirs in fish-bearing waters	
Water Quality and Quantity	Adding new stormwater discharges or increasing impervious surface where all stormwater is treated and detained and no 303(d) listed or TMDL ³ reaches	Adding new stormwater discharges or increasing impervious surfaces where discharge to 303(d)/TMDL³ reach occurs, OR where full treatment and detention does not occur	
Fish Presence, Fish Habitat Use, and Stream Typing	Minor impacts to one or more key aquatic habitats listed above	Substantial impacts to physical habitat or riparian vegetation aquatic habitat elements, OR project involves any changes (negative or positive) in fish passage conditions, OR where stream diversions/fish removal activities occur	

¹ Significant trees should be defined using the local jurisdiction's Critical Areas and/or Urban Forestry code sections. If significant trees are not defined by local code, assume significant trees are those trees 6-inches or greater dbh (diameter breast height).

² LWD – large woody debris

Depending on the outcomes from using the stream assessment flowchart for Phase2 projects, various levels of data collection (either Track B or Track C) will need to be conducted for each Key Aquatic Habitat Element as appropriate. For information on specific stream habitat assessment methods to use under Track B or Track C, refer to **Section 3 - Data Collection for Key Aquatic Habitat Elements.** Tables 3 and 4 in that section outline pertinent assessment methods for each Key Aquatic Habitat Element, including detailed information on specific analysis metrics and survey methods that may be appropriate under Tracks B and C.

³ TMDL – total maximum daily load

3. Data Collection For Key Aquatic Habitat Elements

Once the user has taken their Phase 1 or Phase 2 project through the appropriate flowchart in Section 2, Section 3 should be consulted to obtain more detailed information on specific data sources and stream assessment methodologies. Table 3 summarizes the recommended data to be collected for streams during all stages of project development. This includes background information, which should be collected in all cases, as well as field data collection for Tracks A, B, and C, which will depend on the anticipated level of impact to each Key Aquatic Habitat Element. The information in Table 3 is organized by Key Aquatic Habitat Element. Collection and assessment techniques for each Key Aquatic Habitat Element are described in more detail below. These data needs and assessment procedures have been selected to be generally applicable over the wide range of project types and permitting scenarios encountered by Sound Transit. During project development, the recommendations provided below may need to be adjusted based on project-specific input from regulatory agencies and Tribal entities.

3.1 Riparian Vegetation

For detailed information on specific riparian habitat assessment techniques and methods, see the *Oregon Riparian Assessment Framework* (Clarke, 2004) or Winward (2000). A common method for estimating canopy coverage is presented in (Daubenmire, 1959).

3.1.1 Background Information

- 1) Review existing literature –Reports or data sources that may contain information for reach or sub-basin scale riparian conditions include:
 - The Washington State Conservation Commission Limiting Factors Analysis, organized by Water Resource Inventory area (http://scc.wa.gov/directory/ or http://www.eopugetsound.org/articles/water-resource-inventory-areas-puget-sound)
 - Information on rare plants distribution from the Washington Department of Natural Resources Natural
 Heritage Program Database at:
 http://www.dnr.wa.gov/ResearchScience/HowTo/ConservationRestoration/Pages/amp_nh_data_instructions.aspx
 - Local watershed analysis or stream assessment reports
 - Local Shoreline Master Program Inventory reports Shoreline Master Program Inventory reports http://www.ecy.wa.gov/programs/sea/shorelines/smp/citizen.html
- 2) Review aerial photographs and any available site photos.
 - Google Earth also view past riparian conditions using historic photos on site
 - Bing Maps Birds Eye View feature is useful for assessing riparian conditions
 - Digital or hardcopy orthophotos
- 3) Based on the results of steps 1) and 2) above, summarize the following:
 - General vegetation type (forested, shrub, herbaceous, none (bare earth/built)),
 - Tree canopy type (deciduous, coniferous, or mixed)
 - Approximate density of vegetation types (dense or sparse),
 - Approximate width of buffer on each streambank at project site (based on aerial photos), and
 - Estimated average riparian buffer width upstream and downstream of project site.

Table 3. Overview of Data Collection Needs For Key Aquatic Habitat Elements

Key Aquatic Habitat Element ¹	Background Information ²	Track A ³ – Limited Site Access or No Impact	Track B – Site Access and Minor Impacts	Track C – Site Access and Substantial Impacts OR Site to be Used as Compensatory Mitigation
Riparian Vegetation	Review existing literature Review aerial photographs and existing site photos Characterization should include: vegetation type (i.e., forested, shrub, herbaceous, built, coniferous, deciduous, genus and species if possible), relative vegetation densities	Site visit with qualitative description of riparian conditions: vegetation type, height, and relative density width/length of riparian zone presence of overhanging or fallen vegetation/stream cover presence of invasive plant species (estimate percent cover if possible)	1) Collect qualitative and quantitative field data from riparian zone including: approximate height for each vegetation layer approximate tree/shrub densities identify invasive species and observed snags/dead and down trees width, length, and area of functioning riparian zone stream banks vegetation type, height, and density percent vegetation that covers the stream qualitative evaluation of known limiting riparian factors such LWD³ or shade limitations	Collect Track B data, supplemented by tree counts, GPS survey, or professional land survey within forested riparian impact area to include: tree species tree diameters estimated tree heights locations of snags/dead and down
Physical In-Stream Habitat	Review existing literature Review aerial photographs, topographic maps and site photos Characterization should include: stream width dominant in-stream sediment LWD⁴ presence channel morphology streambank condition	Site visit to qualitatively assess the following through visual observations: • stream width • LWD presence • general channel morphology • general bank condition • dominant stream substrate • relative amount of instream cover and refuge ALSO SEE TABLE 4 FOR MORE DETAILS	1) Site visit to quantitatively assess the following conditions within, upstream, and downstream of project site: • wetted and OHWM ⁵ stream width • LWD size, location, and type • channel morphology - pool, riffle, run, glide • bank condition - stability/armoring • stream substrate - dominant/subdominant and particle distribution ALSO SEE TABLE 4 FOR MORE DETAILS	Same as Track B, but specific habitat impacts or intended use for mitigation may require: 1) Track B data collection over a wider area 2) GPS/professional survey of habitat elements delineated in Track B, or 3) detailed quantitative analysis of habitat elements (e.g., bulk substrate analysis, micro-channel morphology) ALSO SEE TABLE 4 FOR MORE DETAILS
Biological Connectivity	Review existing literature on existing fish passage conditions/barriers and check the WDFW Fish Passage Barrier Map If no barriers are recorded online, Track B/C methods may be required regardless of impact level Review aerial photographs to identify potential barriers at site, upstream, or downstream Review topographic maps and watershed analyses	1) Site visit to qualitatively assess the following information on man-made fish passage structures: • type/material of structure • approximate size/configuration of structure • condition of structure (i.e. wear, damage, etc.)	1) Site visit to quantitatively assess man-made structures: • relative inlet and outlet elevations • stream channel bankfull width 2) If necessary, conduct WDFW Level A Culvert analysis per WDFW (2009) to assess status as fish passage barrier. Check with WDFW prior to conducting the analysis; they may already have that information, particularly if the culvert is on WSDOT right-of-way	Same as Track B, but in some cases coordination with design team on conducting a WDFW Level B culvert analysis per WDFW (2009) may be necessary to accurately assess barrier status
Water Quality and Quantity	1) Review existing literature/databases for information on: • water quality/contaminants, • stream temperatures, • flow data • water quality/quantity limiting factors	1) Site visit with qualitative description of: • type/material of outfall/drainage structure • approximate size/configuration/condition of outfall/drainage structure • visual estimate of streamflow and stream velocity • stream temperature • presence of septic systems within the project area • Water source (stormwater, other?)	No additional effort	No additional effort
Fish Presence, Fish Habitat Use, and Stream Typing	Review existing literature/databases for information on: fish presence and fish habitat use stream typing contributing basin area natural/manmade barriers downstream	If result of background information does not provide complete or definitive results, conduct site visit and make preliminary determination based on WAC 222-16-031. Qualitatively assess the following: • stream width/OHWM, • flow conditions, • fish observations	If result of background information does not provide complete or definitive results proceed with one or more of the following options, as appropriate: 1) Request government/Tribal fish use/stream typing assistance 2) Utilize a qualified biologist to estimate fish presence/absence based on habitat conditions within, upstream, and downstream of site Conduct reconnaissance site visit to identify natural downstream barriers	Same as Track B, but in extraordinary circumstances, fish sampling by a qualified biologist may be appropriate ⁶ . Sampling techniques could potentially include: • snorkel surveys • minnow traps • electrofishing

¹ See text in Section 3 – Data Collection for Key Aquatic Habitat Elements for more specific information on each habitat element

²Background information should be compiled regardless of access situation or level of impacts

³ If lack of access, the information for Track A should be collected in the field from adjacent publicly accessible properties or right of way to the extent possible/practical

⁴ LWD – large woody debris

⁵OHWM – ordinary high water mark

of If information collected as part of Track A or Track B does not provide the required level of certainty on fish presence and stream typing, and no natural barrier exists downstream, generally assume fish presence and consult with ST environmental staff. These activities will require a Scientific Collection Permit from WDFW, and in accordance with WAC 220-20-045. Electrofishing, per requirements in WAC 220-20-045, should only be used to assess fish presence under extraordinary circumstances where such actions are pre-approved by ST (e.g., this information is tied to a permit condition or the information is crucial for design of a substantial design element such as road or culvert)

This page is intentionally left blank.

3.1.2 Track A Information

After collecting and synthesizing relevant background information on riparian vegetation conditions within the project area, conduct a reconnaissance-level site visit within existing Sound Transit or public right-of-way/easement areas. Provide qualitative description of riparian conditions including the following:

- Note buffer vegetation type e.g., forested, shrub, herbaceous, none (bare earth/built). Identify shrub and/or tree species if possible, including any observed invasive species.
- Note relative buffer vegetation density (e.g., sparse, moderately dense, dense) and approximate height of each vegetation layer, particularly the tree layer
- Note observable width/length of riparian zone
- Note extent and type of overhanging vegetation and any observed any observed LWD originating in riparian zone. Estimate percent overhead cover in stream thalweg.
- Note and describe extent of vegetation overhanging stream channel, fallen vegetation
- Qualitative evaluation of potential limiting riparian factors such (LWD or shade limitations)

3.1.3 Track B Information

Collect similar information as listed in Track A; however site access will allow for on-site evaluation of the riparian condition based on qualitative and quantitative field data gathered from within the riparian zone.

- Identify shrub or tree species within the riparian zone, including any observed invasive species.
- Estimate or measure canopy cover and ground cover within the riparian zone (Daubenmire, 1959) for dominant species. If measuring, use plots or intercept along a measuring tape.
- Approximate average diameter (diameter breast height DBH) of trees within riparian zone using representative measurements
- Width and length of functioning riparian zone and
- Riparian interaction with stream banks (e.g., overhanging vegetation, bank stabilization by roots),
- Measure average in-stream riparian cover in the stream thalweg using a densitometer (average riparian cover measured facing upstream, downstream, left bank, and right bank).
- Observations or qualitative evaluation of reach or basin scale limiting riparian factors (such as large-scale LWD or shade limitations).

3.1.4 Track C Information

If the project involves substantial impacts to the riparian corridor, particularly forested riparian areas, it may be necessary to supplement the data collection efforts from above with a more accurate tree survey conducted with GPS survey or professional land survey. Within forested buffer impact areas, detailed survey of the following parameters may be appropriate:

- Tree locations
- Tree species
- Tree diameters
- Estimated tree heights
- Locations of snags and dead/ down woody debris

3.2 Physical In-Stream Habitat

There are literally hundreds of formal assessment protocols prepared for the evaluation of stream environments and habitats. Assessment methods to assess physical in-stream habitat for Pacific Northwest streams are also numerous (e.g. Overton et al. 1997, Pleus and Schuett-Hames 1998, Barbour et al. 1999). In addition, several agencies in the region have developed their own protocols that use unique suites of channel features and channel feature definitions. These protocols generally address measurement of the same in-stream habitat parameters (e.g.,

woody debris, channel morphology, streambank condition) with varying levels of detail. In order to cover the range of data requirements for both Phase 1 and Phase 2 Sound Transit projects, the discussion of field methods (Tracks A, B and C) for an assessment of this Key Aquatic Habitat Element is focused on these in-stream habitat parameters. Table 4 on page 13 details the specific metrics/measurements that may be applicable for each parameter under Tracks A, B, and C, with recommendations for specific methods or protocols, where appropriate. Table 5 summarizes the methodological references noted in Table 4 for various in-stream habitat parameters.

In addition, other authors have compared and contrasted various protocols and assessments from a nation-wide perspective (Somerville, 2010), with a focus on those assessments prepared for application in the Pacific Northwest region (Johnson et al., 2001; Stolnack et al. 2005). These review documents are excellent sources to consult prior to undertaking a detailed physical habitat assessment, especially in cases where the assessment is focused on specific in-stream habitat parameters.

3.2.1 Background Information

- 1) Review existing literature on physical in-stream habitat conditions, including stream size (width), presence of LWD and complex habitat features, approximate stream gradient/channel morphology, stream substrate and sediment condition, and bank condition. Reports that may contain information reach or sub-basin scale physical conditions include:
 - The Washington State Conservation Commission Limiting Factors Analysis, organized by Water Resource Inventory area (http://scc.wa.gov/directory/ or http://www.eopugetsound.org/articles/water-resource-inventory-areas-puget-sound)
 - Salmon recovery plans Puget Sound: http://www.psp.wa.gov/SR_map.php King County: http://www.kingcounty.gov/environment/animalsAndPlants/salmon-and-trout.aspx
 - Shoreline Master Program Inventory reports for local jurisdictions http://www.ecy.wa.gov/programs/sea/shorelines/smp/citizen.html
 - Williams et al. (1975)
 - Local watershed analysis or stream assessment reports
- 2) Review aerial photographs, topographic maps, and any available site photos.
 - Google Earth also view past stream habitat conditions using historic photos on site
 - Bing Maps Birds Eye View feature is useful for assessing some in-stream conditions
 - Digital or hardcopy orthophotos
 - Topographic maps (LIDAR data if available) to determine stream gradients. LIDAR data can be obtained from the Puget Sound LIDAR Consortium at http://pugetsoundlidar.ess.washington.edu/
- 3) Use the results of 1) and 2) above to describe the following in-stream habitat conditions at the site/stream reach to the extent feasible:
 - general horizontal and vertical channel form (stream gradient and channel morphology) including the presence and quality of pools and riffles and channel confinement/entrenchment
 - dominant in-stream substrates (cobble, gravel, fines, etc.) and general sediment transport dynamics (source, transport, or response reach),
 - presence/absence of LWD, or frequency of LWD (if available),
 - streambanks condition, including bank stability and presence of bank hardening/revetments

3.2.2 Track A Information

After collecting and synthesizing relevant background information on in-stream physical habitat conditions within the project area, conduct a site visit within existing Sound Transit or public right-of-way/easement areas. Provide qualitative descriptions, based on visual observations, of on-site in-stream habitat conditions as detailed in Table 4 on the following page. The primary Channel Geomorphological Units (CGU) used for the assessment will

likely be limited to fast/slow habitat types, as the evaluation will be based on visual observations only.

3.2.3 Track B Information

Collect similar information as listed in Track A; however site access will allow for better evaluation of in-stream physical habitat conditions, based on qualitative and quantitative field data gathered from within the stream. Information on specific recommended measurements, including appropriate references, is presented in Table 4. The primary Channel Geomorphological Units (CGU) used for the assessment will likely include a moderate detail (pools, riffles, and runs/glides at a minimum). Pools may be further classified into the type of pool (e.g., lateral scour, medial scour, boulder-formed pocket pool).

3.2.4 Track C Information

If the project involves substantial impacts to in-stream habitat, particularly impacts to the stream bed, stream banks, or local hydraulics, or if the site is to be used for compensatory mitigation, it may be necessary to supplement the data collection efforts from above with more detailed measurements as listed in Table 4.

This page is intentionally left blank.

Table 4. Specific Metrics for Assessment of Physical In-Stream Habitat Parameters

Parameter	Metric/Measurement	Track A – Limited Site Access and Low Impact	Track B – Site Access and Moderate Impacts	Track C– Site Access and Substantial Impacts OR Site to be Used as Compensatory Mitigation
Channel Form and Profile	Macrohabitat - habitat type	Visual characterization of Channel Geomorphological Units (CGUs) into slow/fast water habitats.	Classify and measure macrohabitat unit length using classification including pools, riffles, runs, and/or glides. Depending on specific impacts, additional detail may be appropriate (Arend 1999).	Same as Track B. If substantial alteration of stream hydraulics, may be useful to classify and measure CGUs using detailed classification system (Arend 1999).
	Macrohabitat - pool characteristics	Visual observation of water depths of slow/fast water habitat approximate depth.	Measure maximum pool depths and residual pool depths. Classifying pools based on minimum functional pool width/depth (Pleus et al., 1999).	Same as Track B
	Stream Reach Classification	N/A	N/A	If substantial alteration of stream hydraulics, may be useful to use existing geomorphic classification system to classify project reach - Montgomery and Buffington (1998).
	Stream Slope	Estimate stream slope using topographic maps or LIDAR data if available.	Measure using clinometer or auto-level.	Same as Track B. If substantial alteration of stream hydraulics, may be useful to conduct longitudinal profile study.
	Stream Patterns	Visual observation of channel patterns (e.g., sinuous versus straight channel).	Visual observation of channel patterns (e.g., sinuous versus straight channel).	Same as Track B. If substantial alteration of stream hydraulics, may be useful to measure meander length, radius of curvature, sinuosity, and meander belt width.
	Confinement	Visual assessment of channel confinement and entrenchment.	Measure channel confinement/entrenchment. The entrenchment ratio is the ratio of the width of the flood-prone area to the surface width of the bankfull channel. The flood-prone area width is measured at the elevation that corresponds to twice the maximum depth of the bankfull channel.	Same as Track B. If substantial alteration of stream hydraulics, may be useful to survey complete stream cross-section.
	Channel Dimension/Shape	Visual estimation of bankfull width.	Measure average bankfull width and depth in project area.	Same as Track B. If substantial alteration of stream hydraulics, may be useful to survey complete stream cross-section.
Streambank Condition	Stability	Visual observation of nature and extent of unstable banks.	Measure extent of and location of unstable banks with type of instability (slide, slump, slough, etc.).	Same as Track B. If substantial specific impact to this habitat element or the element is crucial to a key design feature, may be useful to use GPS or PLS to survey location of features.
	Bank Hardening/Revetments	Visual observation of nature and extent of bank hardening/revetments.	Measure extent and location of bank hardening/revetments with type of hardening (riprap, earthen, structural, etc.).	Same as Track B. If substantial specific impact to this habitat element or the element is crucial to a key design feature, may be useful to use GPS or PLS to survey location of features.
Substrate/Sediment	Particle Frequency	Visual estimate of dominant and subdominant substrate over project area.	Visually estimate dominant and subdominant substrate within each CGU. Supplement data with pebble counts at representative pool tail outs (Bunte and Abt 2001).	Same as Track B. If substantial alteration of stream hydraulics, may be useful to use grid surface sampling or sub-surface volumetric sampling (Bunte and Abt 2001).
	Percentage of Fine Sediments/Embeddedness	Visual estimate of amount of surface fines in pools.	Visually estimate percentage of surface fines in each pool CGU. Estimate substrate embeddedness in riffles and pools.	Same as Track B. If substantial alteration of stream hydraulics, may be useful to use grid surface sampling or sub-surface volumetric sampling (Bunte and Abt 2001).
Large Woody Debris	LWD Presence, Frequency, and Location	Visual count of observed pieces of woody debris (>6 feet in length and 0.5 feet in diameter).	Measure location and presence of each piece of LWD (>6 feet in length and 0.5 feet in diameter) and debris jams. Relative position of LWD (thalweg center, thalweg edge, bankfull, bankfull edge).	Same as Track B. If substantial alteration of stream hydraulics or LWD composition, may be useful to measure additional parameters, including mapping/GPS of LWD orientation.
	Debris Jams	Visual observations of presence/absence of LWD jams, including approximate location and size of jam.	Measure location and orientation of each LWD jam, including number of pieces of debris in jam.	Same as Track B. If substantial specific impact to this habitat element or the element is crucial to a key design feature, may be useful to use GPS or PLS to survey location of features.
	LWD Size	Visual estimate of LWD size (length and width).	Measure LWD size (length and width) for each piece of LWD.	Same as Track B. If substantial specific impact to this habitat element or the element is crucial to a key design feature, may be useful to use GPS or PLS to survey location of features.
	Age and Type	Visual estimate of LWD age and composition (deciduous or coniferous).	Measure LWD species (coniferous, deciduous, or unknown) and LWD age class (Shuett-Hames et.al., 1999a).	Same as Track B. If substantial specific impact to this habitat element or the element is crucial to a key design feature, may be useful to use GPS or PLS to survey location of features.
Cover and Refuge	Pool quality	Visual observation of relative pool size, location, depth, and cover.	Assess pool quality using a Pool Quality Index (Platts et al. 1983).	Same as Track B
	Undercut banks	Visual observations of presence/absence of undercut banks.	Measure location and presence of undercut banks.	Same as Track B. If substantial specific impact to this habitat element or the element is crucial to a key design feature, may be useful to use GPS or PLS to survey location of features.
	Off-channel/side-channel habitat	Visual observations of presence/absence of off- channel/side-channel habitat, including associated wetlands. Indicate presence of beaver dams or beaver activity within project area.	Include side-channel habitat in channel form and profile, LWD, streambank condition, and sediment measurements. Measure location, area, and water depth of off-channel areas. Record features of beaver dams and associated habitat.	Same as Track B. If substantial specific impact to this habitat element or the element is crucial to a key design feature, may be useful to use GPS or PLS to survey location of features.
	In-stream cover/protection	Visual observation of aquatic macrophytes, habitat boulders, and other in-stream structures providing cover.	Measure location and presence of aquatic macrophytes, habitat boulders, and other in-stream structures providing cover.	Same as Track B

This page is intentionally left blank.

Table 5 below summarizes the methodologies Sound Transit recommends for assessing in-stream habitat parameters.

Table 5. Methodological References for Physical In-Stream Habitat Parameters

Metric/Measurement	Methodology Reference
Habitat Unit Classification and Measurement	Arend, K.K. 1999. Macrohabitat Identification. Pages 75-93 <i>in</i> M.B. Bain and N.J. Stevenson, editors. Aquatic habitat assessment; common methods. American Fisheries Society. Bethesda, Maryland.
Pool Characteristics measurement of maximum pool depths and residual pool depths classification of pools based on minimum functional pool width/depth	Pleus, A. E., D. Shuett-Hames, and L. Bullchild. 1999. TFW Monitoring Program method manual for the habitat unit survey. Prepared for the WA State Dept. of Natural Resources under the Timber, Fish, and Wildlife Agreement. TFW-AM9-99-003. DNR #105. June. 31 pp.
Stream Reach Classification	Montgomery DR, Buffington JM. 1998. Channel Processes, Classification and Response. <i>In</i> Naiman, R. and Bilby, R. (Eds) River Ecology and Management: Lessons from the Pacific Coastal Ecoregion, New York, NY: Springer-Verlag.
 Sediment Characteristics Particle Frequency Percentage of Fine Sediments/Embeddedness 	Bunte, K. and Abt. S.R. 2001. Sampling surface and subsurface particle size distributions in wadeable gravel and cobble bed streams for analyses in sediment transport, hydraulics and streambed monitoring. General Technical Report RMRS-GRT-74. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 428 pp.
Large Woody Debris LWD Presence, Frequency, and Location Location, orientation, and number of pieces in each LWD jam LWD size (length and diameter) LWD species and age class	Shuett-Hames, D., A. E. Pleus, J. Ward, M. Fox, and J. Light. 1999a. TFW Monitoring Program method manual for the large woody debris survey. Prepared for the Washington State Dept. of Natural Resources under the Timber, Fish, and Wildlife Agreement. TFW-AM9-99-004. DNR #106. March. 33 pp.
Pool Quality Index	Platts, W. S., W. F. Megahan, and G. W Minshall. 1983. Methods for evaluating stream, riparian, and biotic conditions. Gen. Tech. Rep. INT-138. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 70 p. http://www.fs.fed.us/rm/pubs int/int gtr138.pdf

3.3 Biological Connectivity

An analysis of biological connectivity and associated fish passage conditions may be a key element of Sound Transit projects, particularly for the creation, reconstruction, or removal of stream crossings (roads or bridges). Fish passage structures are regulated under the Washington State Hydraulic Code (WAC 220-110-170). Therefore, where such actions may occur, it is important to have early coordination with the project design team to determine and coordinate on overall project design and permitting needs.

Any definitive evaluation of fish passage conditions should be conducted using the *Fish Passage Barrier and Surface Water Diversion Screening Assessment and Prioritization Manual* (WDFW, 2009). Likewise, design of stream crossings should utilize the standards and procedures in the WDFW *Water Crossing Design Guidelines* document (Barnard, et al. 2013).

3.3.1 Background Information

Review existing literature on biological connectivity and fish passage conditions, including the presence of any known or potential man-made or natural barriers to fish passage, including type, size, and location of such features. Data sources that may contain information reach or sub-basin scale biological connectivity and fish passage conditions include:

 WDFW Fish Passage Program: Data and Maps http://wdfw.wa.gov/conservation/habitat/fish_passage/data_maps.html

- WSDOT Fish Passage Reports http://www.wsdot.wa.gov/environment/biology/fp/fishpassage.htm#reports
- Topographic maps of stream for assessment of steep downstream reach gradients /natural barriers
- Local watershed analysis or stream assessment reports

3.3.2 Track A Information

After collecting and synthesizing relevant background information on biological connectivity habitat conditions within the project area, conduct a site visit within existing Sound Transit or public right-of-way/easement areas. Provide qualitative descriptions, based on visual observations, of biological connectivity habitat and fish passage conditions, including the following:

- Location and approximate dimensions of structures including length, width, and height
- Type of structures Culvert, bridge, fishway, weir structure, etc.
- Material of structures Concrete, stone/rip-rap, aluminum, PVC, etc. Note presence of culvert corrugation and liners
- Approximate size/configuration of structures For culverts note type of structure (round, box, bottomless box, squash, arch, elliptical, etc.) and whether structure is countersunk
- Approximate condition of structure Note any deterioration or damage to structure
- Presence of natural streambed material within culvert and estimate of percent of culvert opening affected by sedimentation
- Presence and relative extent of any backwater at culvert inlet
- Presence and height of any perch at culvert outlet
- Presence of any plunge pool at culvert outlet and estimated depth of pool

3.3.3 Track B Information

Collect similar information as listed in Track A, however site access will allow for better evaluation of connectivity and fish passage condition based on qualitative and quantitative field data gathered from within the stream. The use of the Level A Methodology and Field Form from WDFW (2009) is highly recommended for assessment purposes as it will ensure all essential information is captured. In addition to information collected in the Track A analysis on culvert shape, the following data should be recorded per WDFW (2009):

- Measure relative inlet and outlet elevations (preferable) or measured slope of culvert
- Measure culvert dimensions
- Measure stream channel width (bankfull width)
- Measure water surface drop at outfall
- Measure maximum plunge pool depth

3.3.4 Track C Information

If the project involves substantial impacts fish passage structures, particularly the alteration of an existing potential barrier and the Level A Analysis (WDFW, 2009) is not conclusive on barrier status (Level A does not provide conclusive barrier status in all cases), it may be necessary to coordinate with the design team to determine if a Level B analysis is required. This analysis is usually completed by a hydrologist, geomorphologist, or engineer and requires measurement of additional upstream and downstream parameters including channel width, depth, slope, and characterization of bed material. For specific methods, data requirements, and analysis tools, see WDFW (2009).

3.4 Water Quality and Quantity

3.4.1 Background Information

Review existing literature on water quality and flow conditions, including known impairments of water quality and temperature, and stream flow characteristics. Include any information on impairments or limiting factors from the literature or databases. Data sources that may contain information reach or sub-basin scale water quality and flow conditions include:

- Washington Streamflow Data USGS
 Historic data = http://waterdata.usgs.gov/data/realtime/adr/interactive/
 Realtime data=
 http://waterdata.usgs.gov/wa/nwis/current?type=flow
- 303(d) list Washington State Department of Ecology http://www.ecy.wa.gov/programs/wq/303d/
- King County Hydrologic Information Center http://green.kingcounty.gov/WLR/Waterres/hydrology/default.aspx
- Streams Water Quality Monitoring Data
 http://green.kingcounty.gov/WLR/Waterres/StreamsData/StreamList.aspx
- Local watershed analysis or stream assessment reports

3.4.2 Track A Information

After collecting and synthesizing relevant background information on water quality and quantity conditions within the project area, conduct a site visit within existing Sound Transit or public right-of-way/easement areas. Provide qualitative description of water quality and flow conditions including the following:

- Note any drainage outfalls, including type/size/location of structure, possible source and volume of outflow during time of site visit.
- Visually estimate streamflow (in cubic feet per second) and stream velocity (feet/second).

3.4.3 Track B and C Information

In almost all cases, the information gathered during the Background Information and Track A investigations will be sufficient to effectively characterize water quality and flow. However, in certain rare circumstances, additional site-specific water quality and flow measurements may be appropriate. As these circumstances are rare, and any such measurements should be tailored to specific project requirements (e.g., permit conditions), such additional measurements are not discussed in this document.

3.5 Fish Presence, Fish Habitat Use, and Stream Typing

There is a difference between fish presence and fish habitat use, and just because fish may not be present at a given time of the year does not mean that a particular stream or stream habitat is not used by fish. Fish presence may respond to seasonal use of a given stream or habitat type as well as a particular life stage of a given fish species. For these reasons, the general best approach is to assume fish habitat use wherever suitable fish habitat exists, and consult with Sound Transit environmental staff before collecting additional data on fish presence.

The determinations of fish habitat use, and the related element of stream typing, are key in determining the potential severity of project impacts, the width of regulated stream buffers, and the requirements for ensuring fish passage at crossing structures. Although for rivers and larger streams, extensive information exists on fish habitat use and stream type, this information is often times lacking for smaller first and second order tributary streams. The following methods utilize an extensive search of background information coupled with measurements of a stream's physical characteristics to evaluate the potential for fish habitat use based on the presence of suitable fish habitat.

3.5.1 Background Information

Review existing literature on fish habitat use and stream typing conditions, including any documented presence of

fish species potentially or known to be present. It should also include documented or potentially present suitable fish habitat within the project area. Include any existing stream typing information from the literature or databases. Data sources that may contain information reach or sub-basin scale biological connectivity and fish passage conditions include:

- WDFW Priority Habitats and Species Online Mapper
 <a href="http://apps2.dfw.wa.gov/prodphsontheweb/viewer.aspx?auth=dchBC3QPoGho84hRndFNAyiX2awipVxGmK5mj/T0HbP429kXX73bzQ=="http://apps2.dfw.wa.gov/prodphsontheweb/viewer.aspx?auth=dchBC3QPoGho84hRndFNAyiX2awipVxGmK5mj/T0HbP429kXX73bzQ==
- WDFW SalmonScape Database http://apps.wdfw.wa.gov/salmonscape/
- DNR Water Typing Online Mapper http://www.dnr.wa.gov/businesspermits/topics/forestpracticesapplications/pages/fp_watertyping.aspx_
- The Washington State Conservation Commission Limiting Factors Analysis, organized by Water Resource Inventory area (http://www.eopugetsound.org/articles/water-resource-inventory-areas-puget-sound)
- Wild Fish Conservancy Water Type Assessments and Interactive Maps http://wildfishconservancy.org/resources/maps
- Fish distribution in WRIA 8: http://www.govlink.org/watersheds/8/reports/fish-maps/default.aspx
- A Catalog of Washington Streams and Salmon Utilization (Williams et al., 1975)
- Local jurisdiction Critical/Sensitive Area maps
- Local watershed analysis or stream assessment reports

3.5.2 Track A Information

After collecting and synthesizing relevant background information on fish habitat use and stream typing within the project area, conduct a site visit within existing Sound Transit or public right-of-way/easement areas. Visually observe for the presence of fish. If the background information or visual observation does not clearly indicate fish use status of a particular stream, it may be difficult to determine fish use and therefore stream typing) at a site based upon the direct observation of salmonids. Due to poor visibility, low escapement levels, the existence of human-made barriers, or other factors, fish may not be observed during the field visit.

The Forest Practices Rule (WAC 222-16-031) is used to define water types. Based on the WAC, there are a number of methods to determine if a site has the potential to provide fish habitat. Satisfaction of one or more of the following criteria qualifies a water body as fish bearing or potential fish habitat:

- Watercourses shown by DNR as containing fish on DNR stream typing maps, the WDFW Priority Habitats and Species database, or the WDFW SalmonScape database.
- Watercourses with documented salmonid use determined by visual observation, electrofishing, or verification by local biologists.
- Estimate scour line width. Watercourses having average scour line widths (bankfull widths) in excess of 0.6 meters (2 feet) in Western Washington, provided the stream gradient is less than 20 percent.

Note that seasonally dry streams (ephemeral or intermittent) can provide fish habitat during periods of flow. When evaluating dry stream channels, consider the physical characteristics of the channel and proximity to known fish-bearing water. Also, consider the timing of fish presence for species in the area that may enter the habitat when flow is present. For example, chum salmon often use streams that may only flow for a few months out of the year; they will spawn in the channel during the fall when flow is present and fry will out-migrate in the spring immediately after emergence. In another example, off-channel rearing habitat and floodplain habitat may be used by juvenile salmonids during winter months, even though the channel is dry during the summer.

3.5.3 Track B Information

Better site access will allow for a more comprehensive analysis of evaluation of bankfull width, and greater opportunity to visually observe for fish presence. However, increased site access will not necessarily provide definitive results. If the result of background information and Track A does not provide complete or definitive results, the following options may be considered, as appropriate:

- Request fish use/stream typing assistance from WDFW, Tribal entities, or local government agencies.
 Assistance may consist of local knowledge of fish distribution or technical assistance with fish presence studies.
- Utilize a qualified fisheries biologist to estimate fish habitat use based on habitat conditions, within, upstream, and downstream of site, noting that absence of fish during a site investigation does not by itself confirm perennial absence.
- If background information indicates a potentially natural downstream fish barrier, conduct downstream reconnaissance to locate and assess natural barrier. Note that lack of fish access for anadromous species does not indicate absence of resident fish species (e.g., resident cutthroat trout or sculpin).
- Watercourses with documented salmonid use determined by visual observation, electrofishing, or verification by local biologists.

3.5.4 Track C Information

In extraordinary circumstances (e.g., this information is tied to a permit condition or the information is crucial for design of a substantial design element such as road or culvert), electrofishing, per the requirements in WAC 220-20-045 can be used to establish fish presence and stream typing. This pathway should only be used under careful consideration and in consultation with WDFW. Electrofishing, or other fish sampling methods, should be preapproved by Sound Transit environmental staff and conducted by experienced fisheries biologists.

4. Considerations and Limitations

The purpose of this report, including associated flowcharts and tables, is to serve as a guide for assessing streams that are potentially affected by Sound Transit projects. Due to variation in the specific type and severity of project impacts, coupled with property access issues and the unique requirements of multiple regulatory agencies that are commonly involved, it is difficult to craft a "one size fits all" survey protocol. This difficulty is illustrated by an analysis of the stream assessment methods used by two large governmental agencies involved in transportation projects: the Washington State Department of Transportation and the King County Road Services Division. Neither of these agencies has specific stream assessment protocols for determining project impacts. This is also common for most local governments, as a sufficiently broad, detailed, and inclusive stream assessment survey protocol to cover all available project permitting and design needs would be inherently detailed. This in turn can lead to the potential collection of a substantial amount of information, extraneous to the needs of the project, resulting in an increase in project effort and expense.

Therefore, one should consider some project-specific elements prior to assessing streams. This will allow the user to specifically tailor the stream assessment methods in order to both "right size" the analysis methods and to ensure that information is collected in an efficient way that anticipates current and future information needs. These elements can be assessed by asking and answering the following project-specific questions:

- Which specific habitat elements and sub-elements will be affected (e.g., in-stream substrate, stream banks, riparian zone width, etc.)? Think carefully about the specific project impacts or mitigation needs and the information that should be collected to compare or assess these impacts or evaluate appropriate mitigation.
- What project stage or stages is data from the stream assessment to be used -- programmatic planning, alternative comparison, initial permitting, project design, or mitigation design? The stream assessment should be tailored to a level of detail that addressed the current project planning, design, or permitting phase and that will support the related documents and plans.
- If the general purpose of the stream assessment is to help compare project options, is this comparison for programmatic options, many specific design alternatives, a small number of design alternatives, or is the purpose to compare a single alternative with a no-build option? Based on the specific answer, the stream assessment should be tailored to allow for adequate analysis of impacts, without collecting extraneous information. Conversely, if only one site/alignment is being evaluated and access is not limited, collecting more detailed information early on may be beneficial in the long-term, especially if mitigation is necessary.
- If the purpose of the stream assessment is to compare among a limited number of specific design options, do the alternatives impact stream habitats in similar manners and locations? If impacts to streams from most or all of the alternatives will occur in the same geographic area(s), more robust initial stream assessment methods may be appropriate in order to minimize multiple assessments during the project lifecycle, thereby maximizing efficiency and limiting costs.
- What is the project timeframe for alternative comparison, design, and permitting? Expedited timeframes may require a more robust initial stream assessment method, in order to quickly advance design and permitting, or to avoid the risk of unexpected delay at a late stage of the project.
- Are other project staff collecting similar or ancillary field data on stream conditions? It is important to coordinate with other project staff on their data acquisition needs prior to selecting final assessment methods. For example, structural or civil engineers may be performing detailed hydraulic or hydrological analyses within the same stream reaches, and potentially eliminating the need for some channel morphology or sediment data collection during the stream assessment.

REFERENCES

- Arend, K.K. 1999. Macrohabitat Identification. Pages 75-93 *in* M.B. Bain and N.J. Stevenson, editors. Aquatic habitat assessment; common methods. American Fisheries Society. Bethesda, Maryland.
- Barnard, R. J., J. Johnson, P. Brooks, K. M. Bates, B. Heiner, J. P. Klavas, D.C. Ponder, P.D. Smith, and P. D. Powers (2013), Water Crossings Design Guidelines, Washington Department of Fish and Wildlife, Olympia, Washington.
- Bunte, K. and Abt. S.R. 2001. Sampling surface and subsurface particle size distributions in wadeable gravel and cobble bed streams for analyses in sediment transport, hydraulics and streambed monitoring. General Technical Report RMRS-GRT-74. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 428 pp.
- Clarke, S., L. Dent, P. Measeles, T. Nierenberg and J. Runyon. 2004. Oregon Plan for Salmon and Watersheds: Oregon Riparian Assessment Framework. Oregon Watershed Enhancement Board (OWEB). Salem, Oregon.
- Daubenmire, R. 1959. A canopy-coverage method of vegetational analysis. Northwest Science 33:43-64.
- Johnson, D. H., N. Pittman, E. Wilder, J. A. Silver, R. W. Plotnikoff, B. C. Mason, K. K. Jones, P. Roger, T. A. O'Neil, C. Barrett. 2001. Inventory and Monitoring of Salmon Habitat in the Pacific Northwest Directory and Synthesis of Protocols for Management/Research and Volunteers in Washington, Oregon, Idaho, Montana, and British Columbia. Washington Department of Fish and Wildlife, Olympia, Washington. 212 pp.
- Montgomery DR, Buffington JM. 1998. Channel Processes, Classification and Response. *In* Naiman, R. and Bilby, R. (Eds) River Ecology and Management: Lessons from the Pacific Coastal Ecoregion, New York, NY: Springer-Verlag.
- Platts, W. S., W. F. Megahan, and G. W Minshall. 1983. Methods for evaluating stream, riparian, and biotic conditions. Gen. Tech. Rep. INT-138. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 70 p.
- Pleus, A. E., D. Shuett-Hames, and L. Bullchild. 1999. TFW Monitoring Program method manual for the habitat unit survey. Prepared for the WA State Dept. of Natural Resources under the Timber, Fish, and Wildlife Agreement. TFW-AM9-99-003. DNR #105. June. 31 pp.
- Shuett-Hames, D., A. E. Pleus, J. Ward, M. Fox, and J. Light. 1999a. TFW Monitoring Program method manual for the large woody debris survey. Prepared for the Washington State Dept. of Natural Resources under the Timber, Fish, and Wildlife Agreement. TFW-AM9-99-004. DNR #106. March. 33 pp.
- Somerville, D.E. 2010. Stream Assessment and Mitigation Protocols: A Review of Commonalities and Differences, May 4, 2010, Prepared for the U.S. Environmental Protection Agency, Office of Wetlands, Oceans, and Watersheds (Contract No. GS-00F- 0032M). Washington, D.C. Document No. EPA 843-S-12-003.
- Stolnack, Scott A.; Bryant, Mason D.; Wissmar, Robert C. 2005. A review of protocols for monitoring streams and juvenile fish in forested regions of the Pacific Northwest. Gen. Tech. Rep. PNW-

- GTR-625. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 36 p.
- Winward, Alma H. 2000. Monitoring the vegetation resources in riparian areas. Gen. Tech. Rep. RMRSGTR- 47. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 49 p.
- WDFW (Washington Department of Fish and Wildlife). 2009. Fish passage and surface water diversion screening assessment and prioritization manual. Habitat Program: Technical Applications (TAPPS) Division Olympia, WA.
- Williams, R. W., R. M. Laramie, and J. J. Ames. 1975. A Catalog of Washington Streams and Salmon Utilization. Washington Department of Fisheries, Olympia, Washington

Attachment N.4B Wetland Determination Data Forms

The Department of Transportation is committed to ensuring that information is available in appropriate alternative formats to meet the requirements of persons who have a disability. If you require an alternative version of this file, please contact FTAWebAccessibility@dot.gov.

This page is intentionally left blank.

Project Site: West Seattle and Ballard Link Ex	<u>tensions</u>		City/Count	ty: <u>Seattle/King</u>	Sampling Date:	<u>7/15/</u>	<u>19</u>	
Applicant/Owner: Sound Transit				State: <u>WA</u>	Sampling Point:	WSE	1-SP	<u>1</u>
Investigator(s): Amy Rotondo and Rose Whitson	:			Section, Township, Ra	ange: <u>S13, T24N, R03E</u>	-		
Landform (hillslope, terrace, etc.): slope		Local	relief (conca	ave, convex, none): <u>concav</u>	<u>'e</u> Slope	e (%):	<u>5</u>	
Subregion (LRR): A	Lat:	_		Long:	Datum: _			
Soil Map Unit Name: <u>Unclassified City Land</u>				NWI cl	assification: <u>PEM</u>			
Are climatic / hydrologic conditions on the site typical for	this time of y	ear? Ye	s 🗆	No 🛛 (If no, explair	n in Remarks.)			
Are Vegetation □, Soil □, or Hydrology	☐, significa	antly disturbed?	Are "N	Normal Circumstances" preser	nt? Yes		No	\boxtimes
Are Vegetation □, Soil □, or Hydrology	⊠, naturall	ly problematic?	(If nee	eded, explain any answers in	Remarks.)			
SUMMARY OF FINDINGS - Attach site map sh	lowing sam	npling point l	locations,	transects, important fea	tures, etc.			
Hydrophytic Vegetation Present?	Yes 🛛	No □						
Hydric Soil Present?	Yes 🛛		s the Samp within a We		Yes		No	
Wetland Hydrology Present?	Yes 🛚	No 🗆						
Remarks: According to AgACIS, the period prior to fiel	d visit has be	en drier than n	ormal.					
VEGETATION - Use scientific names of plants								
Tree Stratum (Plot size: 30ft)	Absolute	Dominant	Indicator	Dominance Test Workshe	et:			
,	% Cover	Species?	<u>Status</u>					
1				Number of Dominant Specie That Are OBL, FACW, or FA				(A)
2								
3				Total Number of Dominant Species Across All Strata:	<u>3</u>			(B)
4 50% =, 20% =		= Total Cover	. —					
		- Total Covel		Percent of Dominant Species That Are OBL, FACW, or FA				(A/B)
Sapling/Shrub Stratum (Plot size: 15ft)	20		FAC					
1. Rubus armeniacus	<u>20</u>	<u>yes</u>	<u>FAC</u>	Prevalence Index workshot Total % Cover		dy bye		
2				OBL species	<u>Multip</u> x1 =	oly by:		
3 4.				· ·	x1 =	-	_	
5.				FACW species FAC species	x2 = x3 =	-	_	
	20	- Total Cavas			_	-	_	
50% = <u>10</u> , 20% = <u>4</u>	<u>20</u>	= Total Cover		FACU species	x4 =		_	
Herb Stratum (Plot size: 5ft)				UPL species	x5 =		_	
1. <u>Equisetum arvense</u>	<u>100</u>	<u>yes</u>	<u>FAC</u>	Column Totals:	(A)		(E	3)
2. Ranunculus repens	<u>40</u>	<u>yes</u>	<u>FAC</u>	Prevaler	ice Index = B/A =			
3				Hydrophytic Vegetation In				
4				1 – Rapid Test for Hyd	· ·			
5				2 - Dominance Test is	>50%			
6				3 - Prevalence Index i	s <u>≤</u> 3.0¹			
7					ptations¹ (Provide suppo	rting		
8				data in Remarks o	r on a separate sheet)			
9				5 - Wetland Non-Vaso	ular Plants¹			
10				☐ Problematic Hydrophy	rtic Vegetation¹ (Explain)			
11				4				
50% = <u>70</u> , 20% = <u>28</u>	<u>140</u>	= Total Cover	r	¹ Indicators of hydric soil and be present, unless disturbed	, ,,	Ĺ		
Woody Vine Stratum (Plot size: 15ft)				process, armost areas	. o. problemane.			
1								
2				Hydrophytic	=			_
50% =, 20% =		= Total Cover	r	Vegetation	Yes 🛛	No		
% Bare Ground in Herb Stratum				Present?				
The 2016 Plant List was used for	this delineatic	n .			_			
Remarks: Pinus contorta, unknown spruce, (era helix wer	e rooted outside of the sampli	ng point.			

Project Site: West Seattle and Ballard Link Extensions

SOIL Sampling Point: WSE1-SP1 Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Depth Matrix Redox Features Color (moist) % % $I \circ c^2$ Remarks (inches) Color (moist) Type¹ Texture 0-4 2.5Y 3/1 100 gr sa loam* Large gravels 4-10 10YR 4/1 <u>75</u> 7.5YR 4/4 <u>25</u> C M gr sa loam Slightly more clay 7<u>.5 YR 4/4</u> 10-16 10YR 4/1 95 5 C M Slightly more clay gr sa 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 Soils3: Sandy Redox (S5) Histosol (A1) 2 cm Muck (A10) Histic Epipedon (A2) Stripped Matrix (S6) Red Parent Material (TF2) Black Histic (A3) Loamy Mucky Mineral (F1) (except MLRA 1) Very Shallow Dark Surface (TF12) Hydrogen Sulfide (A4) Loamy Gleyed Matrix (F2) Other (Explain in Remarks) \boxtimes Depleted Below Dark Surface (A11) Depleted Matrix (F3) Thick Dark Surface (A12) Redox Dark Surface (F6) ³Indicators of hydrophytic vegetation and Sandy Mucky Mineral (S1) Depleted Dark Surface (F7) wetland hydrology must be present, Sandy Gleyed Matrix (S4) Redox Depressions (F8) unless disturbed or problematic. Restrictive Layer (if present): Severely compacted soils Type: Depth (inches): 10 inches **Hydric Soils Present?** Yes \boxtimes No *gr sa loam = gravelly sandy loam Remarks: At 10 inches, soils were severely compacted. **HYDROLOGY Wetland Hydrology Indicators:** Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (2 or more required) Surface Water (A1) Water-Stained Leaves (B9) Water-Stained Leaves (B9) High Water Table (A2) (except MLRA 1, 2, 4A, and 4B) (MLRA 1, 2, 4A, and 4B) \boxtimes Saturation (A3) Salt Crust (B11) Drainage Patterns (B10) П Water Marks (B1) Aquatic Invertebrates (B13) Dry-Season Water Table (C2) Sediment Deposits (B2) Hydrogen Sulfide Odor (C1) П Saturation Visible on Aerial Imagery (C9) Drift Deposits (B3) Oxidized Rhizospheres along Living Roots (C3) Geomorphic Position (D2) Algal Mat or Crust (B4) Presence of Reduced Iron (C4) Shallow Aquitard (D3) Iron Deposits (B5) Recent Iron Reduction in Tilled Soils (C6) FAC-Neutral Test (D5) Surface Soil Cracks (B6) Stunted or Stresses Plants (D1) (LRR A) Raised Ant Mounds (D6) (LRR A) Inundation Visible on Aerial Imagery (B7) Other (Explain in Remarks) Frost-Heave Hummocks (D7) Sparsely Vegetated Concave Surface (B8) П Field Observations: Surface Water Present? No \boxtimes Depth (inches): \boxtimes Water Table Present? Yes No Depth (inches): Saturation Present? \boxtimes Wetland Hydrology Present? Nο Yes \boxtimes No Depth (inches): 0-10" BGS* Yes (includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: BGS = below ground surface Saturation was present from 0-10 inches and not connected to an immediate water table due to soil compaction.

Project Site:	West Seattle ar	nd Ballard Link Ex	tensions		City/Count	ty: <u>Seattle/King</u>	Sampling	Date:	8/23/1	9	
Applicant/Owner:	Sound Transit					State:	<u>WA</u> Sampling	Point:	WSE1	-SP2	
Investigator(s):	Amy Rotondo a	and Rose Whitson				Section, Townsh	nip, Range: <u>S13, T</u>	724N, R03E			
Landform (hillslope, te	rrace, etc.): <u>h</u>	<u>illslope</u>		Local	relief (conca	ave, convex, none): <u>n</u>	none	Slope	e (%): <u>7</u>		
Subregion (LRR):	<u>A</u>		Lat:	_		Long:		Datum: _			
Soil Map Unit Name:	Unclassified C	City Land				N	NWI classification:	<u>UPL</u>			
Are climatic / hydrolog	ic conditions on	the site typical for	this time of y	/ear? Ye	s 🛚	No 🗌 (If no, e	explain in Remarks.	.)			
Are Vegetation \boxtimes ,	Soil □,	or Hydrology [☐, signific	antly disturbed	Are "N	Normal Circumstances"	present?	Yes		lo [\boxtimes
Are Vegetation ☐,	Soil □,	or Hydrology [☐, natural	ly problematic?	(If nee	eded, explain any answe	ers in Remarks.)				
SUMMARY OF FIN	DINGS – Atta	ch site map sh	owing san		ocations,	transects, importan	t features, etc.				
Hydrophytic Vegetation	n Present?		Yes 🗌	No 🛛	- 41 0	1. d A					
Hydric Soil Present?			Yes 🗌		s the Samp within a Wet			Yes		lo [\boxtimes
Wetland Hydrology Pre	esent?		Yes 🗌	No 🛛							
Remarks: This area	is maintained (m	nowed) by the golf	course.								
VEGETATION - Use	e scientific na	mes of plants				T					
Tree Stratum (Plot size	ze: <u>30ft</u>)		Absolute <u>% Cover</u>	Dominant Species?	Indicator Status	Dominance Test Wo	rksheet:				
1. Picea abies			50	<u>yes</u>	NL (UPL)	Number of Dominant	Species				,
2						That Are OBL, FACW		<u>2</u>		((A)
3						Total Number of Dom	inant	_		,	(5)
4						Species Across All St		<u>5</u>		((B)
50% = <u>25</u> , 20% = <u>10</u>			<u>50</u>	= Total Cove	r	Percent of Dominant S	Species	40		,	(. (.)
Sapling/Shrub Stratu	m (Plot size: <u>15f</u> t	<u>t</u>)				That Are OBL, FACW	, or FAC:	<u>40</u>		((A/B)
1. Rubus armeniacu	<u>IS</u>		<u>30</u>	<u>yes</u>	FAC	Prevalence Index wo	orksheet:				
2						Total % 0	Cover of:	Multip	ly by:		
3						OBL species	<u>0</u>	x1 =	<u>0</u>		
4						FACW species	<u>10</u>	x2 =	<u>20</u>		
5						FAC species	<u>40</u>	x3 =	<u>120</u>		
50% = <u>15</u> , 20% = <u>6</u>			<u>30</u>	= Total Cove	r	FACU species	<u>100</u>	x4 =	<u>400</u>		
Herb Stratum (Plot si	ze: <u>5ft</u>)					UPL species	<u>65</u>	x5 =	325		
1. Convolvulus arve	nsis .		<u>15</u>	<u>yes</u>	NL (UPL)	Column Totals:	<u>215</u> (A)		<u>865</u> (B)	
2. Equisetum telmat	<u>teia</u>		<u>10</u>	<u>yes</u>	FACW	Pi	revalence Index = E	B/A = <u>4.02</u>			
3. Holcus lanatus			<u>5</u>	<u>no</u>	FAC	Hydrophytic Vegetat	tion Indicators:				
4. Agrostis capillaris	<u> </u>		<u>5</u>	no	FAC	☐ 1 – Rapid Test f	for Hydrophytic Veg	etation			
5						2 - Dominance	Test is >50%				
6						☐ 3 - Prevalence I	ndex is <3.01				
7.							al Adaptations¹ (Pro	ovide suppo	rtina		
8.						data in Rema	arks or on a separa	te sheet)	ung		
9.						☐ 5 - Wetland Nor	n-Vascular Plants ¹				
10.						☐ Problematic Hvo	drophytic Vegetation	n ¹ (Explain)			
11.				<u></u>		_ Troblemale rije	aropriyao vogotaao	п (Ехріані)			
50% = <u>17.5</u> , 20% = <u>7</u>			35	= Total Cove		¹ Indicators of hydric s					
Woody Vine Stratum						be present, unless dis	sturbed or problema	itic.			
1. <u>Hedera helix</u>			<u>100</u>	<u>yes</u>	FACU						
2.						Hydrophytic					
50% = 50, 20% = 20			100	= Total Cove		Vegetation	Yes		No		\boxtimes
	arh Stratum 650/	with ive				Present?					
% Bare Ground in He			hio dalis"								
		_ist was used for t llarly maintained (r									
	· ·	•		-							

SOIL Sampling Point: WSE1-SP2 Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Depth Matrix Redox Features (inches) Texture Color (moist) % Color (moist) % Type¹ Loc² Remarks 10YR 2/2 <u>0-8</u> <u>100</u> gr sa loam* fine sand 8-18 10YR 4/2 100 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 Soils3: Histosol (A1) Sandy Redox (S5) 2 cm Muck (A10) Histic Epipedon (A2) Stripped Matrix (S6) Red Parent Material (TF2) Black Histic (A3) Loamy Mucky Mineral (F1) (except MLRA 1) Very Shallow Dark Surface (TF12) Hydrogen Sulfide (A4) Loamy Gleyed Matrix (F2) Other (Explain in Remarks) Depleted Below Dark Surface (A11) Depleted Matrix (F3) Thick Dark Surface (A12) Redox Dark Surface (F6) ³Indicators of hydrophytic vegetation and Sandy Mucky Mineral (S1) Depleted Dark Surface (F7) wetland hydrology must be present, \Box Sandy Gleyed Matrix (S4) Redox Depressions (F8) unless disturbed or problematic. Restrictive Layer (if present): **Hydric Soils Present?** \boxtimes Depth (inches): Yes No Remarks: Soils were dry. *gr sa loam = gravelly sandy loam **HYDROLOGY** Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (2 or more required) Surface Water (A1) Water-Stained Leaves (B9) Water-Stained Leaves (B9) High Water Table (A2) (except MLRA 1, 2, 4A, and 4B) (MLRA 1, 2, 4A, and 4B) Saturation (A3) Salt Crust (B11) Drainage Patterns (B10) Water Marks (B1) Aquatic Invertebrates (B13) Dry-Season Water Table (C2) Sediment Deposits (B2) Hydrogen Sulfide Odor (C1) Saturation Visible on Aerial Imagery (C9) Drift Deposits (B3) Oxidized Rhizospheres along Living Roots (C3) Geomorphic Position (D2) Presence of Reduced Iron (C4) П Algal Mat or Crust (B4) П П Shallow Aquitard (D3) Iron Deposits (B5) Recent Iron Reduction in Tilled Soils (C6) FAC-Neutral Test (D5) Surface Soil Cracks (B6) Stunted or Stresses Plants (D1) (LRR A) Raised Ant Mounds (D6) (LRR A) Inundation Visible on Aerial Imagery (B7) Other (Explain in Remarks) Frost-Heave Hummocks (D7) Sparsely Vegetated Concave Surface (B8) Field Observations: Surface Water Present? \boxtimes Depth (inches): Yes No \boxtimes Water Table Present? Yes No Depth (inches): Saturation Present? Wetland Hydrology Present? No \boxtimes Yes No \boxtimes Depth (inches): (includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks No hydrologic indicators.

Project Site:	West Seattle and Ballard Link Ext	tensions		City/Count	y: <u>Seattle/King</u>	Sampling Date:	<u>7/1</u>	5/19	
Applicant/Owner:	Sound Transit				State: WA	Sampling Point:	WS	SE2-S	<u>P1</u>
Investigator(s):	Amy Rotondo and Rose Whitson				Section, Township, Ra	nge: <u>S13, T24N, R0</u>)3E		
Landform (hillslope, terr	race, etc.): <u>terrace</u>		Local	relief (conca	ve, convex, none): none	SI	ope (%):	: <u>1</u>	
Subregion (LRR):	<u>A</u>	Lat:	_		Long:	Datum	ı:	_	
Soil Map Unit Name:	Unclassified City Land				NWI cla	assification: <u>PEM</u>			
Are climatic / hydrologic	c conditions on the site typical for	this time of ye	ear? Ye	es 🗆	No 🛛 (If no, explain	in Remarks.)			
Are Vegetation □,	Soil ☐, or Hydrology [☐, significa	ntly disturbed	? Are "N	Normal Circumstances" presen	it? Ye	s 🛚	No	
Are Vegetation □,	Soil , or Hydrology [☐, naturall	y problematic?	(If nee	eded, explain any answers in F	Remarks.)			
SUMMARY OF FINE	DINGS – Attach site map sh	owing sam	pling point	locations,	transects, important feat	ures, etc.			
Hydrophytic Vegetation	· · · · · · · · · · · · · · · · · · ·	Yes 🏻	No 🗆	,					
Hydric Soil Present?		Yes ⊠	No 🗆	ls the Samp		Ye	s 🛛	No	
Wetland Hydrology Pre	ocont?	Yes ⊠	No 🗆	within a Wet	land?				
Remarks: According	to AgACIS, the time period prior to	o field visit wa	as drier than n	ormal.					
L									
VEGETATION - Use	scientific names of plants				1				
Tree Stratum (Plot size	e: <u>30ft</u>)	Absolute % Cover	Dominant Species?	Indicator <u>Status</u>	Dominance Test Workshee	et:			
1		70 OOVCI	Орсскоз:	Otatus	Number of Dominant Specie	ne.			
2.					That Are OBL, FACW, or FA				(A)
3.					Total Number of Deminent				
4.					Total Number of Dominant Species Across All Strata:	<u>1</u>			(B)
50% =, 20% = _			= Total Cove		•				
			- Total Cove	ı	Percent of Dominant Specie That Are OBL, FACW, or FA		0		(A/B)
Sapling/Shrub Stratum	<u>II</u> (Plot size: <u>151t</u>)								
1					Prevalence Index workshe				
2					Total % Cover		ultiply by	<u>/:</u>	
3					OBL species	x1	_		
4					FACW species	x2			
5					FAC species	x3	= _		
50% =, 20% = _			= Total Cove	r	FACU species	x4	= _		
Herb Stratum (Plot siz	ze: <u>5ft</u>)				UPL species	x5	= _		
1. Phalaris arundinad	<u>cea</u>	<u>100</u>	<u>yes</u>	FACW	Column Totals:	(A)	_		(B)
2. <u>Cirsium arvense</u>		<u>3</u>	no	FAC		ce Index = B/A =			
3.		_	_		Hydrophytic Vegetation In				
4.					☐ 1 – Rapid Test for Hyd				
5					☑ 2 - Dominance Test is	. , .			
6					3 - Prevalence Index is	s <u><</u> 3.0¹			
7			_		4 - Morphological Ada				
8					data in Remarks of	on a separate sheet)		
9					☐ 5 - Wetland Non-Vasc	ular Plants ¹			
10					☐ Problematic Hydrophy	tic Vegetation¹ (Expla	ain)		
11									
50% = <u>51.5</u> , 20% = <u>20</u>	<u>).6</u>	<u>103</u>	= Total Cove	r	¹ Indicators of hydric soil and be present, unless disturbed		ıust		
Woody Vine Stratum ((Plot size: <u>15ft</u>)				be present, unless disturbed	or problematic.			
1	`								
2					Hydrophytic				
50% =, 20% = _			= Total Cove		Vegetation	Yes 🛛	N	lo	
			= Total Cove	ſ	Present?				
% Bare Ground in Her	rb Stratum								
	The 2016 Plant List was used for the				<u> </u>				
S	Salix lucida was rooted outside of t	this sampling	point.						

Project Site: West Seattle and Ballard Link Extensions

)IL												
rofile Description	on: (Describe to	the depth	needed to	document the	a indicator or	confirm the abs	ence of indicat	tors.)				
Depth	Matrix			R	edox Features							
inches) C	olor (moist)	%	Color (m	oist)	% Тур	pe ¹ Loc ²	Texture	e	Re	emarks		
0-9	10YR 3/2	100		_ 			loam	OM* prese	<u>ent</u>	_		_
<u>9-18</u>	10YR 4/1	<u>93</u>	10YR 3	<u>//6</u>	<u>7</u> <u>C</u>	<u>M</u>	loam	<u> </u>				
				- –			_					
				- —			-					
				- –			_					
				- –			_					
				- <u>-</u>								
												
	ntration, D=Deple					Sand Grains.		=Pore Lining, M=N				
ydric Soil Indica		ole to all ∟	_		•			icators for Proble	=	dric Sc	oils³:	
] Histosol (A1	•			Sandy Red				2 cm Muck (A1	•	·0/		
] Histic Epipe				Stripped M		() (avecant MI DA	1) 🗆	Red Parent Ma	-	-	40)	
Black Histic	` '			=	-	1) (except MLRA	-	Very Shallow D		•	12)	
Hydrogen SDepleted Be		(A11)		•	eyed Matrix (F2)	(1)		Other (Explain	In Keman	'KS)		
	elow Dark Surfac	æ (АТТ)		Depleted N								
	Surface (A12)				k Surface (F6)		³ Ind	licators of hydroph	vtic veget	ation ar	nd	
-	ky Mineral (S1) ed Matrix (S4)			•	Dark Surface (F pressions (F8)	·1)	\	wetland hydrology	must be p	resent,		
strictive Layer				Medox Do	162210112 (1 0)		ι	unless disturbed or	r problema	atic.		
pe:	(II present).											
pe. pth (inches):						Usadais Os	ils Present?		Yes	\boxtimes	No	
	## a organic matte					Hydric Sc						
Oxic DROLOGY	dized rhizosphere					Hydric Sc						
Oxid DROLOGY etland Hydrolo	dized rhizosphere	es present		* apply)		Hydric Sc		ndany Indicators (2	or more i	roquire	۹/	
DROLOGY etland Hydrolo	gy Indicators:	es present	; check all tha		and Loaves (R		Seco	ndary Indicators (2			d)	
Oxio DROLOGY etland Hydrolo imary Indicators Surface Wa	gy Indicators: s (minimum of on	es present		Water-Stai	ned Leaves (B	9)		Water-Stained Le	aves (B9)		d)	
DROLOGY etland Hydrolo imary Indicators Surface Wa High Water	gy Indicators: 6 (minimum of on ater (A1) Table (A2)	es present	; check all tha	Water-Stai	LRA 1, 2, 4A, a	9)	Seco	Water-Stained Lea	aves (B9) and 4B)		d)	
DROLOGY etland Hydrologimary Indicators Surface Wa High Water Saturation (gy Indicators: 6 (minimum of on ater (A1) Table (A2) (A3)	es present	; check all tha	Water-Stai (except M	LRA 1, 2, 4A, a	9) and 4B)	Seco	Water-Stained Lea (MLRA 1, 2, 4A, a Drainage Patterns	aves (B9) and 4B) s (B10)		d)	
DROLOGY etland Hydrologimary Indicators Surface Wall High Water Saturation (Water Mark	gy Indicators: s (minimum of on ater (A1) Table (A2) (A3) ss (B1)	es present	; check all tha	Water-Stai (except Mi Salt Crust Aquatic Inv	LRA 1, 2, 4A, a (B11) vertebrates (B1	9) and 4B)	Seco	Water-Stained Lea (MLRA 1, 2, 4A, a Drainage Patterns Dry-Season Wate	aves (B9) and 4B) s (B10) er Table (C	C2)		
DROLOGY etland Hydrologimary Indicators Surface Wall High Water Saturation (Water Mark	gy Indicators: s (minimum of on ater (A1) Table (A2) (A3) ss (B1) Deposits (B2)	es present	; check all tha	Water-Stai (except MI Salt Crust Aquatic Inv	LRA 1, 2, 4A, a (B11) vertebrates (B1 Sulfide Odor (C	9) and 4B) 3) C1)	Seco	Water-Stained Le. (MLRA 1, 2, 4A, a Drainage Patterns Dry-Season Wate Saturation Visible	aves (B9) and 4B) s (B10) er Table (C on Aerial	C2)		
DROLOGY etland Hydrolo mary Indicators Surface Wa High Water Saturation (Water Mark Sediment D Drift Deposi	gy Indicators: s (minimum of on ater (A1) Table (A2) (A3) ss (B1) Deposits (B2) its (B3)	es present	; check all tha	Water-Stai (except MI Salt Crust Aquatic Inv Hydrogen S Oxidized R	LRA 1, 2, 4A, a (B11) vertebrates (B1 Sulfide Odor (C Rhizospheres al	9) and 4B) 3) C1) long Living Roots	Seco	Water-Stained Lea (MLRA 1, 2, 4A, a Drainage Patterns Dry-Season Wate Saturation Visible Geomorphic Posit	aves (B9) and 4B) s (B10) er Table (C on Aerial tion (D2)	C2)		
DROLOGY etland Hydrolo imary Indicators Surface Wa High Water Saturation (Water Mark Sediment D Drift Deposi	gy Indicators: 6 (minimum of on ater (A1) Table (A2) (A3) 85 (B1) Deposits (B2) its (B3) r Crust (B4)	es present	; check all tha	Water-Stai (except Mi Salt Crust Aquatic Inv Hydrogen S Oxidized R Presence of	LRA 1, 2, 4A, a (B11) vertebrates (B1 Sulfide Odor (C Rhizospheres al of Reduced Iror	9) and 4B) 3) C1) long Living Roots	Seco	Water-Stained Lea (MLRA 1, 2, 4A, a Drainage Patterns Dry-Season Wate Saturation Visible Geomorphic Posit Shallow Aquitard	aves (B9) and 4B) s (B10) r Table (C on Aerial tion (D2) (D3)	C2)		
DROLOGY etland Hydrologimary Indicators Surface Wa High Water Saturation (Water Mark Sediment D Drift Deposited in the property of the property	gy Indicators: 6 (minimum of on ater (A1) Table (A2) (A3) (S (B1) Deposits (B2) its (B3) or Crust (B4) its (B5)	es present	; check all tha	Water-Stai (except Mi Salt Crust Aquatic Inv Hydrogen S Oxidized R Presence of Recent Iron	LRA 1, 2, 4A, a (B11) vertebrates (B1 Sulfide Odor (C Rhizospheres al of Reduced Iron n Reduction in	9) and 4B) 3) C1) long Living Roots n (C4) Tilled Soils (C6)	Seco	Water-Stained Le. (MLRA 1, 2, 4A, a Drainage Patterns Dry-Season Wate Saturation Visible Geomorphic Posit Shallow Aquitard FAC-Neutral Test	aves (B9) and 4B) s (B10) er Table (C on Aerial tion (D2) (D3) (D5)	C2) Imager		
DROLOGY etland Hydrologimary Indicators Surface Water Saturation (Water Marker Sediment D Drift Deposite Algal Mat of Iron Deposite Surface Soi	gy Indicators: 6 (minimum of on later (A1) 7 Table (A2) (A3) 8 (B1) 9 Deposits (B2) 8 its (B3) 9 r Crust (B4) 8 its (B5) 8 it Cracks (B6)	es present	; check all tha	Water-Stai (except Mi Salt Crust Aquatic Inv Hydrogen S Oxidized R Presence of Recent Iron Stunted or	LRA 1, 2, 4A, a (B11) vertebrates (B1 Sulfide Odor (C Rhizospheres al of Reduced Iron n Reduction in Stresses Plant	9) and 4B) 3) C1) long Living Roots n (C4) Tilled Soils (C6) ts (D1) (LRR A)	Seco	Water-Stained Lea (MLRA 1, 2, 4A, a Drainage Patterns Dry-Season Wate Saturation Visible Geomorphic Posit Shallow Aquitard FAC-Neutral Test Raised Ant Mound	aves (B9) and 4B) s (B10) er Table (C on Aerial tion (D2) (D3) (D5) ds (D6) (L	C2) Imagei		
DROLOGY etland Hydrologimary Indicators Surface Wall High Water Saturation (Water Mark Sediment D Drift Deposit Algal Mat on Iron Deposit Surface Soit	gy Indicators: 6 (minimum of on ater (A1) Table (A2) (A3) 68 (B1) Deposits (B2) its (B3) or Crust (B4) its (B5) il Cracks (B6) Visible on Aerial	es present ne required Imagery (I	; check all tha	Water-Stai (except Mi Salt Crust Aquatic Inv Hydrogen S Oxidized R Presence of Recent Iron Stunted or	LRA 1, 2, 4A, a (B11) vertebrates (B1 Sulfide Odor (C Rhizospheres al of Reduced Iron n Reduction in	9) and 4B) 3) C1) long Living Roots n (C4) Tilled Soils (C6) ts (D1) (LRR A)	Seco	Water-Stained Le. (MLRA 1, 2, 4A, a Drainage Patterns Dry-Season Wate Saturation Visible Geomorphic Posit Shallow Aquitard FAC-Neutral Test	aves (B9) and 4B) s (B10) er Table (C on Aerial tion (D2) (D3) (D5) ds (D6) (L	C2) Imagei		
DROLOGY etland Hydrolo imary Indicators Surface Wa High Water Saturation (Water Mark Sediment D Drift Deposi Algal Mat or Iron Deposi Surface Soi Inundation V	gy Indicators: (minimum of on ater (A1) (A3) (S (B1) (Deposits (B2) (its (B3) (r Crust (B4) (its (B5) (it (B5) (it (B5) (it (B6) (Visible on Aerial (egetated Concav	es present ne required Imagery (I	; check all tha	Water-Stai (except Mi Salt Crust Aquatic Inv Hydrogen S Oxidized R Presence of Recent Iron Stunted or	LRA 1, 2, 4A, a (B11) vertebrates (B1 Sulfide Odor (C Rhizospheres al of Reduced Iron n Reduction in Stresses Plant	9) and 4B) 3) C1) long Living Roots n (C4) Tilled Soils (C6) ts (D1) (LRR A)	Seco	Water-Stained Lea (MLRA 1, 2, 4A, a Drainage Patterns Dry-Season Wate Saturation Visible Geomorphic Posit Shallow Aquitard FAC-Neutral Test Raised Ant Mound	aves (B9) and 4B) s (B10) er Table (C on Aerial tion (D2) (D3) (D5) ds (D6) (L	C2) Imagei		
DROLOGY etland Hydrolo imary Indicators Surface Wa High Water Saturation (Water Mark Sediment D Drift Deposi Algal Mat or Iron Deposi Surface Soi Inundation Sparsely Ve	gy Indicators: 6 (minimum of on ater (A1) Table (A2) (A3) 85 (B1) Deposits (B2) its (B3) or Crust (B4) its (B5) il Cracks (B6) Visible on Aerial egetated Concavens:	ne required Imagery (I	; check all tha	Water-Stai (except Mi Salt Crust Aquatic Inv Hydrogen 3 Oxidized R Presence of Recent Iron Stunted or Other (Exp	LRA 1, 2, 4A, a (B11) vertebrates (B1 Sulfide Odor (C Rhizospheres al of Reduced Iron n Reduction in Stresses Plant blain in Remarks	9) and 4B) 3) C1) long Living Roots n (C4) Tilled Soils (C6) ts (D1) (LRR A)	Seco	Water-Stained Lea (MLRA 1, 2, 4A, a Drainage Patterns Dry-Season Wate Saturation Visible Geomorphic Posit Shallow Aquitard FAC-Neutral Test Raised Ant Mound	aves (B9) and 4B) s (B10) er Table (C on Aerial tion (D2) (D3) (D5) ds (D6) (L	C2) Imagei		
DROLOGY etland Hydrologimary Indicators Surface Wa High Water Saturation (Water Mark Sediment D Drift Deposit Algal Mat on Iron Deposit Surface Soit Inundation (Sparsely Veleto Observation (Iron Description (gy Indicators: 6 (minimum of on ater (A1) 7 Table (A2) (A3) 8 (B1) Deposits (B2) its (B3) or Crust (B4) its (B5) il Cracks (B6) Visible on Aerial egetated Concavens: esent? Yes	lmagery (I	; check all tha	Water-Stai (except Mil Salt Crust Aquatic Inv Hydrogen S Oxidized R Presence of Recent Iron Stunted or Other (Exp	LRA 1, 2, 4A, a (B11) vertebrates (B1 Sulfide Odor (C Rhizospheres al of Reduced Iror n Reduction in Stresses Plant blain in Remark: (inches):	9) and 4B) 3) C1) long Living Roots n (C4) Tilled Soils (C6) ts (D1) (LRR A)	Seco	Water-Stained Lea (MLRA 1, 2, 4A, a Drainage Patterns Dry-Season Wate Saturation Visible Geomorphic Posit Shallow Aquitard FAC-Neutral Test Raised Ant Mound	aves (B9) and 4B) s (B10) er Table (C on Aerial tion (D2) (D3) (D5) ds (D6) (L	C2) Imagei		
DROLOGY etland Hydrologimary Indicators Surface Water Saturation (Water Mark Sediment D Drift Deposi Algal Mat or Iron Deposi Surface Soi Inundation (Sparsely Veld Observation urface Water Present Table Present Sparsely Veld Observation Sparsely Veld Observation	gy Indicators: s (minimum of on ater (A1) Table (A2) (A3) ss (B1) Deposits (B2) its (B3) r Crust (B4) its (B5) il Cracks (B6) Visible on Aerial egetated Concav ns: esent? Yes ent? Yes	Imagery (I	; check all tha	Water-Stai (except Mi Salt Crust Aquatic Inv Hydrogen 3 Oxidized R Presence of Recent Iron Stunted or Other (Exp	LRA 1, 2, 4A, a (B11) vertebrates (B1 Sulfide Odor (C Rhizospheres al of Reduced Iror n Reduction in Stresses Plant blain in Remark: (inches):	9) and 4B) 3) C1) long Living Roots n (C4) Tilled Soils (C6) ts (D1) (LRR A)	Seco	Water-Stained Lea (MLRA 1, 2, 4A, a Drainage Patterns Dry-Season Wate Saturation Visible Geomorphic Posit Shallow Aquitard FAC-Neutral Test Raised Ant Mound Frost-Heave Hum	aves (B9) and 4B) s (B10) or Table (C on Aerial tion (D2) (D3) (D5) ds (D6) (L	C2) Imager .RR A)	ry (C9)	
DROLOGY etland Hydrologimary Indicators Surface Water Saturation (Water Mark Sediment D Drift Deposit Algal Mat on Iron Deposit Surface Soit Inundation (Sparsely Vereld Observation urface Water Presentaturation Presen	gy Indicators: 6 (minimum of on ater (A1) 7 Table (A2) (A3) 8 (B1) Deposits (B2) its (B3) or Crust (B4) its (B5) il Cracks (B6) Visible on Aerial egetated Concav ns: esent? Yes ent? Yes	Imagery (I	; check all tha	Water-Stai (except Mi Salt Crust Aquatic Inv Hydrogen 3 Oxidized R Presence of Recent Iron Stunted or Other (Exp	LRA 1, 2, 4A, a (B11) vertebrates (B1 Sulfide Odor (C Rhizospheres al of Reduced Iror n Reduction in Stresses Plant blain in Remark: (inches):	9) and 4B) 3) C1) long Living Roots n (C4) Tilled Soils (C6) ts (D1) (LRR A)	Seco	Water-Stained Lea (MLRA 1, 2, 4A, a Drainage Patterns Dry-Season Wate Saturation Visible Geomorphic Posit Shallow Aquitard FAC-Neutral Test Raised Ant Mound	aves (B9) and 4B) s (B10) or Table (C on Aerial tion (D2) (D3) (D5) ds (D6) (L	C2) Imagei		0
DROLOGY etland Hydrologimary Indicators Surface Water Saturation (Water Mark Sediment D Drift Deposi Algal Mat or Iron Deposi Surface Soi Inundation (Sparsely Veled Observation urface Water Presentator Table Presentation Prese	gy Indicators: (a) (minimum of on ater (A1) (A3) (a) (B4) (b) (b) (b) (c) (b) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c	Imagery (I	; check all that	Water-Stai (except Mil Salt Crust Aquatic Inv Hydrogen S Oxidized R Presence of Recent Iron Stunted or Other (Exp Depth Depth	LRA 1, 2, 4A, a (B11) vertebrates (B1 Sulfide Odor (C) Rhizospheres al of Reduced Iror in Reduction in Stresses Plant blain in Remarks (inches): (inches):	9) and 4B) 3) C1) long Living Roots n (C4) Tilled Soils (C6) ts (D1) (LRR A)	Seco	Water-Stained Lea (MLRA 1, 2, 4A, a Drainage Patterns Dry-Season Wate Saturation Visible Geomorphic Posit Shallow Aquitard FAC-Neutral Test Raised Ant Mound Frost-Heave Hum	aves (B9) and 4B) s (B10) or Table (C on Aerial tion (D2) (D3) (D5) ds (D6) (L	C2) Imager .RR A)	ry (C9)	0
DROLOGY etland Hydrologimary Indicators Surface Wa High Water Saturation (Water Mark Sediment D Drift Deposi Algal Mat or Iron Deposi Surface Soi Inundation (Sparsely Veled Observation urface Water Presentaturation Pr	gy Indicators: (a) (minimum of on ater (A1) (A3) (a) (B4) (b) (b) (b) (c) (b) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c	Imagery (I	; check all that	Water-Stai (except Mil Salt Crust Aquatic Inv Hydrogen S Oxidized R Presence of Recent Iron Stunted or Other (Exp Depth Depth	LRA 1, 2, 4A, a (B11) vertebrates (B1 Sulfide Odor (C) Rhizospheres al of Reduced Iror in Reduction in Stresses Plant blain in Remarks (inches): (inches):	9) and 4B) 3) C1) long Living Roots n (C4) Tilled Soils (C6) ts (D1) (LRR A) s)	Seco	Water-Stained Lea (MLRA 1, 2, 4A, a Drainage Patterns Dry-Season Wate Saturation Visible Geomorphic Posit Shallow Aquitard FAC-Neutral Test Raised Ant Mound Frost-Heave Hum	aves (B9) and 4B) s (B10) or Table (C on Aerial tion (D2) (D3) (D5) ds (D6) (L	C2) Imager .RR A)	ry (C9)	0

Project Site:	West Seattle ar	nd Ballard Link E	xtensions	<u> </u>			City/Count	y: <u>Seattle/King</u>		Sampling	Date:	8/23	<u>8/19</u>	
Applicant/Owner:	Sound Transit							Sta	te: <u>WA</u>	Sampling	Point:	WS	E2-SF	<u>2</u>
Investigator(s):	Amy Rotondo a	and Rose Whitson	<u>1</u>					Section, Tov	vnship, Rang	je: <u>S13, T</u>	24N, R03E			
Landform (hillslope, te	errace, etc.): <u>t</u>	oe of slope				Loca	al relief (conca	ve, convex, none):	none		Slope	: (%):	<u>0</u>	
Subregion (LRR):	<u>A</u>		Lat:		_			Long:			Datum:			
Soil Map Unit Name:	Unclassified C	City Land							NWI class	sification:	<u>PSS</u>			
Are climatic / hydrolog	ic conditions on	the site typical fo	this time	e of ye	ear?	Υ	′es ⊠	No 🗌 (If r	no, explain ir	Remarks.)			
Are Vegetation	, Soil □,	or Hydrology	□, sig	gnifica	intly dis	sturbe	d? Are "N	Normal Circumstance	es" present?		Yes	\boxtimes	No	
Are Vegetation	, Soil □,	or Hydrology	□, na	turally	y proble	ematic	? (If nee	eded, explain any an	nswers in Re	marks.)				
SUMMARY OF FIN		ch site map s	nowing	sam	pling	point	t locations,	transects, impor	rtant featur	es, etc.				
Hydrophytic Vegetatio	n Present?		Yes	\boxtimes	No		l- 4b- 0							
Hydric Soil Present?			Yes	\boxtimes	No		Is the Samp within a Wet				Yes	\boxtimes	No	
Wetland Hydrology Pr	esent?		Yes	\boxtimes	No									
Remarks:														
VEGETATION - Us	e scientific na	ames of plants	i											
Tree Stratum (Plot si	ze: <u>30ft</u>)		Absolu <u>% Cov</u>		Domii Speci		Indicator <u>Status</u>	Dominance Test	Worksheet:					
1								Number of Domina	ant Species		2			(Δ)
2								That Are OBL, FA	CW, or FAC	:	<u> </u>			(A)
3								Total Number of D	Dominant		<u>2</u>			(B)
4								Species Across Al	ll Strata:		<u> </u>			(D)
50% =, 20% =	·				= Tota	al Cov	er	Percent of Domina			100			(A/B)
Sapling/Shrub Stratu	m (Plot size: <u>15f</u>	<u>t</u>)						That Are OBL, FA	CW, or FAC	:	100			(700)
1. Rubus spectabilis	<u>s</u>		<u>60</u>		<u>ves</u>		<u>FAC</u>	Prevalence Index	k worksheet	:				
2. Rubus armeniacu	<u>us</u>		<u>10</u>		<u>no</u>		<u>FAC</u>	<u>Total</u>	% Cover of:		Multip	ly by:		
3								OBL species			x1 =	_		
4								FACW species			x2 =			
5								FAC species			x3 =	_		
50% = <u>35</u> , 20% = <u>14</u>			<u>70</u>		= Tota	al Cov	er	FACU species			x4 =			
Herb Stratum (Plot si	ize: <u>5ft</u>)							UPL species			x5 =			
1. Impatiens capens	<u>sis</u>		<u>40</u>		yes		<u>FACW</u>	Column Totals:		(A)			(B)
2. <u>Calystegia sepiur</u>	<u>m</u>		<u>5</u>		<u>no</u>		<u>FAC</u>		Prevalence	Index = B/	'A =			
3. Equisetum telma	<u>teia</u>		<u>2</u>		no		<u>FACW</u>	Hydrophytic Veg	etation Indi	cators:				
4								☐ 1 – Rapid Te	est for Hydro	phytic Veg	etation			
5								2 - Dominan	nce Test is >5	50%				
6								☐ 3 - Prevalen	ice Index is <	3.0 ¹				
7								4 - Morpholo	ogical Adapta	ations¹ (Pro	vide suppo	rting		
8									Remarks or or					
9								☐ 5 - Wetland	Non-Vascula	ar Plants ¹				
10								☐ Problematic	Hydrophytic	Vegetation	n¹ (Explain)			
11										_				
50% = <u>23.5</u> , 20% = <u>9</u>	<u>9.4</u>		<u>47</u>		= Tota	al Cov	er	¹ Indicators of hydr be present, unless						
Woody Vine Stratum	(Plot size: 15ft)							be present, unless	s distuibed o	i problema	uo.			
1														
2								Hydrophytic			_			_
50% =, 20% =	:				= Tota	al Cov	er	Vegetation Present?	Y	es	\boxtimes	No)	
% Bare Ground in He	erb Stratum 53							i resent f						
		List was used for	this delin	eatio	n.									
						(with	10% cover) w	as rooted across the	e stream.					

Project Site: West Seattle and Ballard Link Extensions SOIL Sampling Point: WSE2-SP2 Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Depth Matrix Redox Features (inches) Color (moist) % Color (moist) % Type¹ Loc² Texture Remarks 10YR 3/1 0-7 100 silt loam some OM* <u>7-18</u> 2.5Y 5/2 97 7.5YR 4/4 3 C M 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 Soils3: Histosol (A1) Sandy Redox (S5) 2 cm Muck (A10) Histic Epipedon (A2) Stripped Matrix (S6) Red Parent Material (TF2) Black Histic (A3) Loamy Mucky Mineral (F1) (except MLRA 1) Very Shallow Dark Surface (TF12) Hydrogen Sulfide (A4) Loamy Gleyed Matrix (F2) Other (Explain in Remarks) \boxtimes \boxtimes Depleted Below Dark Surface (A11) Depleted Matrix (F3) Thick Dark Surface (A12) Redox Dark Surface (F6) ³Indicators of hydrophytic vegetation and Sandy Mucky Mineral (S1) Depleted Dark Surface (F7) wetland hydrology must be present, \Box Sandy Gleyed Matrix (S4) Redox Depressions (F8) unless disturbed or problematic. Restrictive Layer (if present): **Hydric Soils Present?** \boxtimes Depth (inches) No Yes Remarks: *OM = organic matter Aquic moisture regime present. Redoximorphic features were diffuse. **HYDROLOGY** Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (2 or more required) Surface Water (A1) Water-Stained Leaves (B9) Water-Stained Leaves (B9) \boxtimes High Water Table (A2) (except MLRA 1, 2, 4A, and 4B) (MLRA 1, 2, 4A, and 4B) Saturation (A3) Salt Crust (B11) Drainage Patterns (B10) Water Marks (B1) Aquatic Invertebrates (B13) Dry-Season Water Table (C2) Sediment Deposits (B2) Hydrogen Sulfide Odor (C1) Saturation Visible on Aerial Imagery (C9) Drift Deposits (B3) Oxidized Rhizospheres along Living Roots (C3) Geomorphic Position (D2) Algal Mat or Crust (B4) Presence of Reduced Iron (C4) Shallow Aquitard (D3) Iron Deposits (B5) Recent Iron Reduction in Tilled Soils (C6) FAC-Neutral Test (D5) Surface Soil Cracks (B6) Stunted or Stresses Plants (D1) (LRR A) Raised Ant Mounds (D6) (LRR A) Inundation Visible on Aerial Imagery (B7) Other (Explain in Remarks) Frost-Heave Hummocks (D7) Sparsely Vegetated Concave Surface (B8) Field Observations: Surface Water Present? \boxtimes П Depth (inches): Yes No Water Table Present? Yes \boxtimes No Depth (inches): 8"BGS* Saturation Present? Wetland Hydrology Present? \boxtimes No Yes No \boxtimes Depth (inches): (includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks *BGS = below ground surface Soils were damp but not saturated from the water table up to the ground surface.

Applicant/Owner: Investigator(s):	Sound Transit							State: WA	Sar	mpling F	Point:	MC		
Investigator(s):								olate. <u>www.</u>		pg .	Oli It.	<u>vv</u> 3	E2-SI	<u>P3</u>
	Amy Rotondo a	and Rose Whitso	<u>n</u>					Section, Township, R	ange:	S13, T2	24N, R03E	Ξ		
Landform (hillslope, ter	race, etc.): <u>ł</u>	<u>nillslope</u>				Loca	I relief (conca	ave, convex, none): <u>conca</u>	<u>ve</u>		Slop	e (%):	<u>2</u>	
Subregion (LRR):	<u>A</u>		Lat:		_			Long:			Datum:		-	
Soil Map Unit Name:	Unclassified (City Land						NWI c	lassifica	ation:	<u>UPL</u>			
Are climatic / hydrologi	c conditions on	the site typical fo	r this time	e of ye	ear?	Ye		No 🗌 (If no, explai		marks.)				
Are Vegetation □,	Soil □,	or Hydrology			intly dis			Normal Circumstances" prese	nt?		Yes	\boxtimes	No	
Are Vegetation □,	Soil □,	or Hydrology	□, na	iturally	y proble	ematic?	(If ne	eded, explain any answers in	Remark	ks.)				
		ch site map s			•		locations,	transects, important fea	tures,	etc.				
Hydrophytic Vegetation	n Present?		Yes		No		Is the Samp	lad Δraa						_
Hydric Soil Present?			Yes		No		within a We				Yes		No	\boxtimes
Wetland Hydrology Pre	esent?		Yes		No	\boxtimes								
Remarks:														
VEGETATION - Use	scientific na	mes of plants						Γ						
Tree Stratum (Plot siz	:e: <u>30ft</u>)		Absolu <u>% Cov</u>		Domir Speci		Indicator Status	Dominance Test Worksho	et:					
1				_				Number of Dominant Speci	es		0			(4)
2								That Are OBL, FACW, or F			<u>2</u>			(A)
3								Total Number of Dominant			0			(D)
4								Species Across All Strata:			<u>3</u>			(B)
50% =, 20% =					= Tota	al Cove	er	Percent of Dominant Speci	es		07			(A/D)
Sapling/Shrub Stratur	<u>n</u> (Plot size: <u>15f</u>	<u>t</u>)						That Are OBL, FACW, or F	AC:		<u>67</u>			(A/B)
1. Cytisis scoparius			<u>7</u>		yes		<u>UPL</u>	Prevalence Index worksh	eet:					
2. Rubus armeniacu	<u>s</u>		<u>5</u>		<u>yes</u>		FAC	<u>Total % Cover</u>	of:		Multi	oly by:	<u>.</u>	
3. Cornus sericea			<u>2</u>		<u>no</u>		<u>FACW</u>	OBL species	_		x1 =			
4. Salix scouleriana			<u>2</u>		<u>no</u>		FAC	FACW species	_		x2 =			
5								FAC species	_		x3 =	_		
50% = <u>8</u> , 20% = <u>3.2</u>			<u>16</u>		= Tota	al Cove	er	FACU species	_		x4 =			
Herb Stratum (Plot siz	ze: <u>5ft</u>)							UPL species			x5 =			
1. Agrostis capillaris			100		yes		FAC	Column Totals:	(A)					(B)
2. Festuca spp.			<u>3</u>		no		<u>NI</u>	Prevale			\ =			
3.			_		_		_	Hydrophytic Vegetation I	ndicato	ors:				
4.				,				☐ 1 – Rapid Test for Hy			tation			
5				,				☐ 2 - Dominance Test is		•				
6.				,				3 - Prevalence Index						
7.								4 - Morphological Ada	_		ما ما ما ما ما	- rtin a		
8.								data in Remarks o				orung		
9								5 - Wetland Non-Vas	cular Pl	lants ¹				
10.								_			1 (Evalaia			
11.								Problematic Hydroph	ytic vec	getation	· (Explain)		
50% = <u>51.5</u> , 20% = <u>20</u>	1.6		103		- Tota	al Cove		¹ Indicators of hydric soil an	d wetla	nd hydr	ology mus	st		
Woody Vine Stratum			100		- 1016	ai Cove	÷1	be present, unless disturbe	d or pro	oblemat	ic.			
-	(FIOL SIZE. <u>1311)</u>													
1			-					Hydrophytic						
2 50% =, 20% =				•		al Cove		Vegetation	Yes		\boxtimes	N	0	
					- 10la	ai COVE	71	Present?						
% Bare Ground in He	rb Stratum	_												

SOIL Sampling Point: WSE2-SP3 Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Depth Matrix Redox Features (inches) Color (moist) % Color (moist) % Type¹ Loc² Texture Remarks 10YR 3/2 Compacted soils at 8 inches <u>8-0</u> <u>100</u> silt loam ²Location: PL=Pore Lining, M=Matrix ¹Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils3: Histosol (A1) Sandy Redox (S5) 2 cm Muck (A10) Histic Epipedon (A2) Stripped Matrix (S6) Red Parent Material (TF2) Black Histic (A3) Loamy Mucky Mineral (F1) (except MLRA 1) Very Shallow Dark Surface (TF12) Hydrogen Sulfide (A4) Loamy Gleyed Matrix (F2) Other (Explain in Remarks) Depleted Below Dark Surface (A11) Depleted Matrix (F3) Thick Dark Surface (A12) Redox Dark Surface (F6) ³Indicators of hydrophytic vegetation and Sandy Mucky Mineral (S1) Depleted Dark Surface (F7) wetland hydrology must be present, \Box Sandy Gleyed Matrix (S4) Redox Depressions (F8) unless disturbed or problematic. Restrictive Layer (if present): compacted soils **Hydric Soils Present?** \boxtimes Depth (inches): Yes No Remarks: Soils were dry. No redoximorphic features were present except on rock faces **HYDROLOGY** Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (2 or more required) Surface Water (A1) Water-Stained Leaves (B9) Water-Stained Leaves (B9) High Water Table (A2) (except MLRA 1, 2, 4A, and 4B) (MLRA 1, 2, 4A, and 4B) Saturation (A3) Salt Crust (B11) Drainage Patterns (B10) Water Marks (B1) Aquatic Invertebrates (B13) Dry-Season Water Table (C2) Sediment Deposits (B2) Hydrogen Sulfide Odor (C1) Saturation Visible on Aerial Imagery (C9) Drift Deposits (B3) Oxidized Rhizospheres along Living Roots (C3) Geomorphic Position (D2) Presence of Reduced Iron (C4) Shallow Aquitard (D3) П Algal Mat or Crust (B4) П П Iron Deposits (B5) Recent Iron Reduction in Tilled Soils (C6) FAC-Neutral Test (D5) Surface Soil Cracks (B6) Stunted or Stresses Plants (D1) (LRR A) Raised Ant Mounds (D6) (LRR A) Inundation Visible on Aerial Imagery (B7) Other (Explain in Remarks) Frost-Heave Hummocks (D7) Sparsely Vegetated Concave Surface (B8) Field Observations: Surface Water Present? \boxtimes Depth (inches): Yes No \boxtimes Water Table Present? Yes No Depth (inches): Saturation Present? Wetland Hydrology Present? No \boxtimes Yes No \boxtimes Depth (inches): Yes (includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks

Project Site: West Seattle and Ballard	Link Extensions	City/Cou	nty: <u>Seattle/King</u>	Sampling Date:	8/23/19	
Applicant/Owner: Sound Transit			State: <u>WA</u>	Sampling Point:	WSE2-SF	<u>P4</u>
Investigator(s): Amy Rotondo and Rose	<u>Whitson</u>		Section, Township, Ran	ge: S13, T24N, R03E		
Landform (hillslope, terrace, etc.): slope		Local relief (cond	cave, convex, none): <u>convex</u>	Slope	: (%): <u>10</u>	
Subregion (LRR): <u>A</u>	Lat:	_	Long:	Datum: _		
Soil Map Unit Name: <u>Unclassified City Land</u>			NWI clas	sification: <u>UPL</u>		
Are climatic / hydrologic conditions on the site ty	pical for this time of	year? Yes ⊠	No ☐ (If no, explain i	n Remarks.)		
Are Vegetation \square , Soil \square , or Hydro	ology , signific	antly disturbed? Are	"Normal Circumstances" present	? Yes	☐ No	\boxtimes
Are Vegetation , Soil , or Hydro	ology □, natural	ly problematic? (If n	eeded, explain any answers in Re	emarks.)		
SUMMARY OF FINDINGS - Attach site r	nap showing san	npling point locations	, transects, important featu	res, etc.		
Hydrophytic Vegetation Present?	Yes 🗌	No 🛛				
Hydric Soil Present?	Yes 🗌	No Is the Sam within a W		Yes	☐ No	\boxtimes
Wetland Hydrology Present?	Yes 🗌		otiana i			
Remarks: Vegetation on slope is regularly mai	ntained (mowed) by	golf course.				
Togotation on disposit regularly man		go., cou.co.				
VEGETATION – Use scientific names of	plants					
Tree Stratum (Plot size: 30ft)	Absolute % Cover	Dominant Indicator Species? Status	Dominance Test Worksheet	:		
1	<u> 70 00001</u>	opener. etatae	Number of Dominant Species			
2	· 		That Are OBL, FACW, or FAC			(A)
3.			Total Number of Dominant			
4.			Species Across All Strata:	<u>2</u>		(B)
50% = , 20% =		= Total Cover	Percent of Dominant Species			
Sapling/Shrub Stratum (Plot size: 15ft)			That Are OBL, FACW, or FAC			(A/B)
1. Rubus armeniacus	<u>80</u>	<u>yes</u> <u>FAC</u>	Prevalence Index workshee			
2. Rosa gymnocarpa	<u>80</u>	yes FACU	Total % Cover of		lv bv:	
3	<u>55</u>	<u>17100</u>	OBL species <u>0</u>	x1 =	<u>0</u>	
4			FACW species <u>0</u>	x2 =	<u>o</u>	
5.	· 		FAC species <u>88</u>	x3 =	<u>s</u> 264	
50% = <u>80,</u> 20% = <u>32</u>	160	= Total Cover	FACU species 80	x4 =	320	
Herb Stratum (Plot size: 5ft)	100	- Total Cover		x5 =		
	00	N.I.			<u>0</u>	
1. Mowed grasses	<u>80</u>	<u>yes</u> <u>NI</u>	Column Totals: 168 (A		<u>584</u> (B)	
2. Rumex crispus	<u>5</u>	no <u>FAC</u>		ce Index = B/A = <u>3.47</u>		
3. <u>Conium maculatum</u>	<u>3</u>	no FAC	Hydrophytic Vegetation Ind			
4			☐ 1 – Rapid Test for Hydro			
5			☐ 2 - Dominance Test is >	50%		
6			☐ 3 - Prevalence Index is	<u><</u> 3.0¹		
7			4 - Morphological Adapt	ations¹ (Provide suppo	rting	
8			data in Remarks or c	n a separate sheet)		
9			☐ 5 - Wetland Non-Vascu	ar Plants ¹		
10	·		☐ Problematic Hydrophytic	c Vegetation¹ (Explain)		
11						
50% = <u>44</u> , 20% = <u>17.6</u>	<u>88</u>	= Total Cover	¹ Indicators of hydric soil and v			
Woody Vine Stratum (Plot size: 15ft)			be present, unless disturbed t	n problematic.		
1						
2.			Hydrophytic			
50% =, 20% =		= Total Cover		Yes 🗌	No	\boxtimes
			Present?			
% Bare Ground in Herb Stratum 12						
Remarks: The 2016 Plant List was u	sea for this delineati	on.				

Depth Matri inches) Color (moist) 0-14 10YR 3/2	ix %	_		Redox Features			
	%			Redox Features			
<u>0-14</u> <u>10YR 3/2</u>		Co	lor (mois	t) % Type ¹	Loc ²	Texture	Remarks
<u> </u>	<u>100</u>				. —	silt loam	
					·		
					· —		
					· —		
					· —		
	-				· ——		
	-				· ——		
		- M-Doduos		CS=Covered or Costed So			Pore Lining, M=Matrix
dric Soil Indicators: (Appl	•			, CS=Covered or Coated Sa	ind Grains.		ators for Problematic Hydric Soils ³ :
Histosol (A1)	icable to a	II LKKS, U		Sandy Redox (S5)			2 cm Muck (A10)
Histic Epipedon (A2)				Stripped Matrix (S6)			Red Parent Material (TF2)
Black Histic (A3)			_	Loamy Mucky Mineral (F1) (except MI PA 1	_	Very Shallow Dark Surface (TF12)
Hydrogen Sulfide (A4)				Loamy Gleyed Matrix (F2)	except MLICA I	, 🗆	Other (Explain in Remarks)
Depleted Below Dark Su	ırface (Δ11)		Depleted Matrix (F3)			Other (Explain in Remarks)
Thick Dark Surface (A12		,		Redox Dark Surface (F6)			
Sandy Mucky Mineral (S	•			Depleted Dark Surface (F7)		³ Indica	ators of hydrophytic vegetation and
Sandy Gleyed Matrix (Sa	•			Redox Depressions (F8)		wet	tland hydrology must be present,
strictive Layer (if present)	-			redex Depressions (1 o)		unie	less disturbed or problematic.
pe:	r-						
oth (inches):					Hydric Soils	Drocont?	Yes □ No [
DROLOGY							
tland Hydrology Indicator							
tland Hydrology Indicator mary Indicators (minimum c		red; check					ary Indicators (2 or more required)
tland Hydrology Indicator mary Indicators (minimum of Surface Water (A1)		red; check		Water-Stained Leaves (B9)			/ater-Stained Leaves (B9)
tland Hydrology Indicator mary Indicators (minimum o Surface Water (A1) High Water Table (A2)		red; check		Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and	d 4B)	W:	/ater-Stained Leaves (B9) //LRA 1, 2, 4A, and 4B)
tland Hydrology Indicator mary Indicators (minimum o Surface Water (A1) High Water Table (A2) Saturation (A3)		red; check		Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and Salt Crust (B11)	i 4B)	□ W: (M	/ater-Stained Leaves (B9) //LRA 1, 2, 4A, and 4B) rainage Patterns (B10)
tland Hydrology Indicator mary Indicators (minimum of Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1)	of one requi	red; check		Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and Salt Crust (B11) Aquatic Invertebrates (B13)	·	W:	Vater-Stained Leaves (B9) VALUE A. 1, 2, 4A, and 4B) rainage Patterns (B10) ry-Season Water Table (C2)
tland Hydrology Indicator mary Indicators (minimum of Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2)	of one requi	red; check		Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1)	·	W: (M) Dr	/ater-Stained Leaves (B9) //LRA 1, 2, 4A, and 4B) rainage Patterns (B10) ry-Season Water Table (C2) aturation Visible on Aerial Imagery (C9)
tland Hydrology Indicator mary Indicators (minimum of Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3)	of one requi	red; check		Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres alon	g Living Roots (0	W. (M Dr Dr Sa	/ater-Stained Leaves (B9) //LRA 1, 2, 4A, and 4B) rainage Patterns (B10) ry-Season Water Table (C2) aturation Visible on Aerial Imagery (C9) eomorphic Position (D2)
stland Hydrology Indicator mary Indicators (minimum of Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4)	of one requi	red; check		Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres alon Presence of Reduced Iron (6)	g Living Roots (0	W. (M Dr Dr Dr Sa C3) Ge	Adater-Stained Leaves (B9) ALRA 1, 2, 4A, and 4B) rainage Patterns (B10) ry-Season Water Table (C2) aturation Visible on Aerial Imagery (C9) eomorphic Position (D2) hallow Aquitard (D3)
etland Hydrology Indicator mary Indicators (minimum of Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5)	of one requi	red; check		Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres alon Presence of Reduced Iron (Recent Iron Reduction in Till	g Living Roots (0 C4) led Soils (C6)	Wa	Adter-Stained Leaves (B9) ALRA 1, 2, 4A, and 4B) rainage Patterns (B10) ry-Season Water Table (C2) aturation Visible on Aerial Imagery (C9) eomorphic Position (D2) hallow Aquitard (D3) AC-Neutral Test (D5)
tland Hydrology Indicator mary Indicators (minimum of Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Surface Soil Cracks (B6	of one requi			Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres alon Presence of Reduced Iron (C) Recent Iron Reduction in Till Stunted or Stresses Plants (g Living Roots (0 C4) led Soils (C6)	W:	//ater-Stained Leaves (B9) //LRA 1, 2, 4A, and 4B) rainage Patterns (B10) rry-Season Water Table (C2) aturation Visible on Aerial Imagery (C9) eomorphic Position (D2) hallow Aquitard (D3) AC-Neutral Test (D5) aised Ant Mounds (D6) (LRR A)
tland Hydrology Indicator mary Indicators (minimum of Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Surface Soil Cracks (B6) Inundation Visible on A6	of one requi	ry (B7)		Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres alon Presence of Reduced Iron (Recent Iron Reduction in Till	g Living Roots (0 C4) led Soils (C6)	W:	Adter-Stained Leaves (B9) ALRA 1, 2, 4A, and 4B) rainage Patterns (B10) ry-Season Water Table (C2) aturation Visible on Aerial Imagery (C9) eomorphic Position (D2) hallow Aquitard (D3) AC-Neutral Test (D5)
Manual Hydrology Indicator mary Indicators (minimum of Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Surface Soil Cracks (B6 Inundation Visible on A6 Sparsely Vegetated Cor	of one requi	ry (B7)		Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres alon Presence of Reduced Iron (C) Recent Iron Reduction in Till Stunted or Stresses Plants (g Living Roots (0 C4) led Soils (C6)	W:	//ater-Stained Leaves (B9) //LRA 1, 2, 4A, and 4B) rainage Patterns (B10) rry-Season Water Table (C2) aturation Visible on Aerial Imagery (C9) eomorphic Position (D2) hallow Aquitard (D3) AC-Neutral Test (D5) aised Ant Mounds (D6) (LRR A)
etland Hydrology Indicator mary Indicators (minimum of Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Surface Soil Cracks (B6) Inundation Visible on Act Sparsely Vegetated Conditional Conditions:	of one requi) 6) erial Imager ncave Surfa	ry (B7) ace (B8)		Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres alon Presence of Reduced Iron (C1) Recent Iron Reduction in Till Stunted or Stresses Plants (Other (Explain in Remarks)	g Living Roots (0 C4) led Soils (C6)	W:	//ater-Stained Leaves (B9) //LRA 1, 2, 4A, and 4B) rainage Patterns (B10) rry-Season Water Table (C2) aturation Visible on Aerial Imagery (C9) eomorphic Position (D2) hallow Aquitard (D3) AC-Neutral Test (D5) aised Ant Mounds (D6) (LRR A)
etland Hydrology Indicator mary Indicators (minimum of Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Surface Soil Cracks (B6) Inundation Visible on A6 Sparsely Vegetated Conditions: Inface Water Present?	of one requi	ry (B7) ace (B8)		Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres alon Presence of Reduced Iron (C1) Recent Iron Reduction in Till Stunted or Stresses Plants (Other (Explain in Remarks) Depth (inches):	g Living Roots (0 C4) led Soils (C6)	W:	//ater-Stained Leaves (B9) //LRA 1, 2, 4A, and 4B) rainage Patterns (B10) rry-Season Water Table (C2) aturation Visible on Aerial Imagery (C9) eomorphic Position (D2) hallow Aquitard (D3) AC-Neutral Test (D5) aised Ant Mounds (D6) (LRR A)
etland Hydrology Indicator mary Indicators (minimum of Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Surface Soil Cracks (B6) Inundation Visible on Act Sparsely Vegetated Control old Observations: Ifface Water Present?	of one requi	ry (B7) ace (B8)] No] No		Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres alon Presence of Reduced Iron (CR) Recent Iron Reduction in Till Stunted or Stresses Plants (Other (Explain in Remarks) Depth (inches): Depth (inches):	g Living Roots (0 C4) led Soils (C6) D1) (LRR A)	W. (M	//ater-Stained Leaves (B9) //LRA 1, 2, 4A, and 4B) rainage Patterns (B10) ry-Season Water Table (C2) aturation Visible on Aerial Imagery (C9) eomorphic Position (D2) hallow Aquitard (D3) AC-Neutral Test (D5) aised Ant Mounds (D6) (LRR A) rost-Heave Hummocks (D7)
etland Hydrology Indicator mary Indicators (minimum of Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Surface Soil Cracks (B6) Inundation Visible on Act Sparsely Vegetated Control old Observations: Inface Water Present? Iter Table Present? Ituration Present? Ituration Present?	of one requi	ry (B7) ace (B8) No No		Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres alon Presence of Reduced Iron (CR) Recent Iron Reduction in Till Stunted or Stresses Plants (Other (Explain in Remarks) Depth (inches): Depth (inches):	g Living Roots (CC4) led Soils (C6) D1) (LRR A)	War (M)	//ater-Stained Leaves (B9) //LRA 1, 2, 4A, and 4B) rainage Patterns (B10) ry-Season Water Table (C2) aturation Visible on Aerial Imagery (C9) eomorphic Position (D2) hallow Aquitard (D3) AC-Neutral Test (D5) aised Ant Mounds (D6) (LRR A) rost-Heave Hummocks (D7)
etland Hydrology Indicator mary Indicators (minimum of Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Surface Soil Cracks (B6) Inundation Visible on Active Sparsely Vegetated Control of Observations: rface Water Present? atter Table Present? cludes capillary fringe)	of one requi	ry (B7) ace (B8) No No		Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres alon Presence of Reduced Iron (CR) Recent Iron Reduction in Till Stunted or Stresses Plants (Other (Explain in Remarks) Depth (inches): Depth (inches):	g Living Roots (CC4) led Soils (C6) D1) (LRR A)	War (M)	//ater-Stained Leaves (B9) //LRA 1, 2, 4A, and 4B) rainage Patterns (B10) ry-Season Water Table (C2) aturation Visible on Aerial Imagery (C9) eomorphic Position (D2) hallow Aquitard (D3) AC-Neutral Test (D5) aised Ant Mounds (D6) (LRR A) rost-Heave Hummocks (D7)

Project Site: West Se	eattle and Ballard Link Ex	<u>xtensions</u>		City/Coun	ty: <u>Seattle/King</u>	Sampling [Date:	7/15/	<u>/19</u>	
Applicant/Owner: Sound	<u> </u>				State: <u>W</u>	A Sampling F	Point:	WSE	=3-SF	<u>21</u>
Investigator(s): Amy Ro	otondo and Rose Whitsor	<u>1</u>			Section, Township,	Range: <u>S13, T2</u>	24N, R03E			
Landform (hillslope, terrace, etc	c.): <u>terrace</u>		Loca	al relief (conca	ave, convex, none): <u>con</u>	<u>cave</u>	Slope	(%):	<u><1</u>	
Subregion (LRR): A		Lat:	_		Long:		Datum: _			
Soil Map Unit Name: <u>Unclas</u>	ssified City Land				NW	I classification:	<u>PFO</u>			
Are climatic / hydrologic conditi	ons on the site typical for	r this time of y	/ear? Y	′es □	No 🛛 (If no, exp	olain in Remarks.)				
Are Vegetation ☐, Soil	☐, or Hydrology	☐, signific	antly disturbed	d? Are "I	Normal Circumstances" pre	sent?	Yes		No	\boxtimes
Are Vegetation ☐, Soil	□, or Hydrology	⊠, natural	ly problematic	? (If ne	eded, explain any answers	in Remarks.)				
SUMMARY OF FINDINGS	- Attach site map sh	howing sar	npling point	t locations,	transects, important f	eatures, etc.				
Hydrophytic Vegetation Presen	t?	Yes 🛛	No 🗆							
Hydric Soil Present?		Yes 🛛	No 🔲	Is the Samp within a We			Yes	\boxtimes	No	
Wetland Hydrology Present?		Yes 🛛	No 🔲	within a vve	uanu:					
Remarks: according to AgAC	US, the prior period has b	een drier tha	n normal.	I						
Tromand. according to Agric	io, the phot period has a	oon and the	ii iioiiiiai.							
VEGETATION - Use scien	tific names of plants									
Tree Stratum (Plot size: 30ft)	ino names of plants	Absolute % Cover	Dominant Species?	Indicator	Dominance Test Works	sheet:				
1. Alnus rubra		90	Species? yes	Status FAC	Number of Deminent Co.	agiaa				
2		<u> </u>	<u>100</u>	<u>. 7.10</u>	Number of Dominant Sp That Are OBL, FACW, o		<u>4</u>			(A)
3										
4.					Total Number of Domina Species Across All Strats		<u>5</u>			(B)
50% = <u>45,</u> 20% = <u>18</u>		90	= Total Cov							
Sapling/Shrub Stratum (Plot s	izo: 15ft)	<u>30</u>	- Total Cov	CI	Percent of Dominant Spe That Are OBL, FACW, o		<u>80</u>			(A/B)
1. Salix lucida	126. <u>101t</u>)	1	VOC	FACW	Prevalence Index work					
Oemleria cerasiformis		<u>1</u>	<u>yes</u>	<u>FACU</u>	Total % Cov		Multipl	v bv:		
		<u>1</u>	<u>yes</u>			<u>/ei oi.</u>	x1 =	y by.		
3. <u>Cornus sericea</u>		<u>1</u>	<u>yes</u>	<u>FACW</u>	OBL species _				_	
4 5.					FACW species _		x2 = x3 =	_		
					FAC species _				_	
50% = <u>1.5</u> , 20% = <u>0.6</u>		<u>3</u>	= Total Cov	er	FACU species _		x4 =	_		
Herb Stratum (Plot size: 5ft)					UPL species		x5 =	_	_	
1. Ranunculus repens		<u>100</u>	<u>yes</u>	<u>FAC</u>	Column Totals:	(A)		_	((B)
2. <u>Impatiens capensis</u>		<u>5</u>	<u>no</u>	<u>FACW</u>	Preva	lence Index = B/A	A =			
3. <u>Oenanthe sarmentosa</u>		<u>5</u>	<u>no</u>	<u>OBL</u>	Hydrophytic Vegetation	n Indicators:				
4. <u>Urtica dioica</u>		<u>1</u>	<u>no</u>	<u>FAC</u>	☐ 1 – Rapid Test for	Hydrophytic Vege	etation			
5					□ 2 - Dominance Test	st is >50%				
6					☐ 3 - Prevalence Inde	ex is <u><</u> 3.0 ¹				
7					4 - Morphological A	- Adaptations¹ (Prov	vide suppor	tina		
8						s or on a separate		9		
9.					☐ 5 - Wetland Non-V	ascular Plants ¹				
10.					☐ Problematic Hydro	nhytic Vegetation	1 (Evolain)			
11.					— Troblematic Trydro	priyac vegetation	(Explail)			
50% = <u>55.5</u> , 20% = <u>22.2</u>		111	= Total Cov		¹ Indicators of hydric soil					
Woody Vine Stratum (Plot size	o: 15ft\	111	- Total Cov	GI	be present, unless distur	bed or problemat	ic.			
,	s. <u>1011)</u>									
1					Hydrophytic					
2					Vegetation	Yes	\boxtimes	No		
50% =, 20% =			= Total Cov	er	Present?					-
% Bare Ground in Herb Stratu	ım									
Remarks: The 2016	6 Plant List was used for	this delineation	on.							

Project Site: West Seattle and Ballard Link Extensions

SOIL Sampling Point: WSE3-SP1 Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Depth Matrix Redox Features (inches) Color (moist) % Color (moist) % Type¹ Loc² Texture Remarks 10YR 3/1 <u>8-0</u> 100 <u>loam</u> inclusion of fine sand <u>8-14</u> 10YR 3/1 97 5YR 3/4 3 C <u>PL</u> loam 14-20 N 3/0 98 7.5YR 3/4 2 <u>C</u> Μ silt loam some OM* ²Location: PL=Pore Lining, M=Matrix ¹Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils3: Histosol (A1) Sandy Redox (S5) 2 cm Muck (A10) Histic Epipedon (A2) Stripped Matrix (S6) Red Parent Material (TF2) Black Histic (A3) Loamy Mucky Mineral (F1) (except MLRA 1) Very Shallow Dark Surface (TF12) Hydrogen Sulfide (A4) Loamy Gleyed Matrix (F2) Other (Explain in Remarks) Depleted Below Dark Surface (A11) Depleted Matrix (F3) \boxtimes Thick Dark Surface (A12) Redox Dark Surface (F6) ³Indicators of hydrophytic vegetation and Sandy Mucky Mineral (S1) Depleted Dark Surface (F7) wetland hydrology must be present, \Box Sandy Gleyed Matrix (S4) Redox Depressions (F8) unless disturbed or problematic. Restrictive Layer (if present): Depth (inches): **Hydric Soils Present?** \boxtimes Yes No Remarks: *OM = organic material Faint sulphur smell **HYDROLOGY** Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (2 or more required) Surface Water (A1) Water-Stained Leaves (B9) Water-Stained Leaves (B9) High Water Table (A2) (except MLRA 1, 2, 4A, and 4B) (MLRA 1, 2, 4A, and 4B) Saturation (A3) Salt Crust (B11) Drainage Patterns (B10) Water Marks (B1) Aquatic Invertebrates (B13) Dry-Season Water Table (C2) Sediment Deposits (B2) Hydrogen Sulfide Odor (C1) Saturation Visible on Aerial Imagery (C9) Drift Deposits (B3) Oxidized Rhizospheres along Living Roots (C3) Geomorphic Position (D2) \boxtimes Algal Mat or Crust (B4) Presence of Reduced Iron (C4) Shallow Aquitard (D3) Iron Deposits (B5) Recent Iron Reduction in Tilled Soils (C6) \boxtimes FAC-Neutral Test (D5) Surface Soil Cracks (B6) Stunted or Stresses Plants (D1) (LRR A) Raised Ant Mounds (D6) (LRR A) Inundation Visible on Aerial Imagery (B7) Other (Explain in Remarks) Frost-Heave Hummocks (D7) Sparsely Vegetated Concave Surface (B8) Field Observations: Surface Water Present? \boxtimes П Depth (inches): Yes No \boxtimes Water Table Present? Yes No Depth (inches): Saturation Present? Wetland Hydrology Present? \boxtimes No Yes \boxtimes No Depth (inches): 14" BGS* (includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks *BGS = below ground surface Sampling point is located in a concave depression at the toe of a slope.

Project Site:	West Seattle ar	nd Ballard Link Ex	<u>tensions</u>		City/Coun	ty: <u>Seattle/King</u>	Sampling Date	e:	8/23/19	
Applicant/Owner:	Sound Transit					State: WA	Sampling Poir	nt:	WSE3-S	P2
Investigator(s):	Amy Rotondo a	and Rose Whitson				Section, Township, I	Range: <u>S13, T241</u>	N, R03E		
Landform (hillslope, te	rrace, etc.): <u>s</u>	slope		Loca	I relief (conca	ave, convex, none): <u>conv</u>	<u>ex</u>	Slope	(%): <u>3</u>	
Subregion (LRR):	<u>A</u>		Lat:	_		Long:	Da	atum:		
Soil Map Unit Name:	Unclassified C	City Land				NWI	classification: <u>\</u>	JPL_		
Are climatic / hydrolog	ic conditions on	the site typical for	this time of y	ear? Yo	es 🛛	No 🗌 (If no, expla	ain in Remarks.)			
Are Vegetation ,	Soil □,	or Hydrology [☐, significa	ntly disturbed	? Are "l	Normal Circumstances" pres	ent?	Yes	⊠ No	
Are Vegetation	Soil □,	or Hydrology [☐, naturall	y problematic?	? (If ne	eded, explain any answers i	n Remarks.)			
SUMMARY OF FIN	DINGS – Atta	ch site map sh	owing sam	pling point	locations,	transects, important fe	atures, etc.			
Hydrophytic Vegetatio		•	Yes 🗆	No 🛛	•		<u> </u>			
Hydric Soil Present?			Yes 🗌	No 🛛	Is the Samp			Yes	□ No	\boxtimes
Wetland Hydrology Pro	esent?		Yes 🗆	No 🖾	within a We	tland?				
, ,,				🚨						
Remarks:										
VEGETATION - Us	e scientific na	imes of plants	Absolute	Dominant	Indicator					
Tree Stratum (Plot size	ze: <u>30ft</u>)		% Cover	Species?	Status	Dominance Test Worksh	neet:			
1. Acer macrophyllu	<u>ım</u>		<u>70</u>	<u>yes</u>	<u>FACU</u>	Number of Dominant Spe		1		(A)
2. <u>Alnus rubra</u>			<u>30</u>	<u>yes</u>	FAC	That Are OBL, FACW, or	FAC:	<u>1</u>		(A)
3. <u>Unknown conifer</u>			<u>15</u>	<u>no</u>	<u>NI</u>	Total Number of Dominan	ıt	5		(B)
4. <u>Thuja plicata</u>			<u>10</u>	<u>no</u>	<u>FAC</u>	Species Across All Strata	:	<u>5</u>		(D)
50% = <u>62.5</u> , 20% = <u>2</u>	<u>5</u>		<u>125</u>	= Total Cove	er	Percent of Dominant Spec	cies	20		(A/D)
Sapling/Shrub Stratu	<u>m</u> (Plot size: <u>15f</u>	<u>t</u>)				That Are OBL, FACW, or	FAC:	<u>20</u>		(A/B)
1. Mahonia aquifoliu	<u>ım</u>		<u>25</u>	<u>yes</u>	FACU	Prevalence Index works	heet:			
2. Rubus parviflorus	<u>3</u>		<u>10</u>	<u>yes</u>	FACU	Total % Cove	er of:	Multiply	y by:	
3. Symphoricarpos	<u>albus</u>		<u>3</u>	no	<u>FACU</u>	OBL species 0		x1 =	<u>0</u>	
4. Corylus cornuta			<u>3</u>	no	<u>FACU</u>	FACW species 0		x2 =	<u>0</u>	
5						FAC species 40	<u>)</u>	x3 =	<u>120</u>	
50% = <u>20.5</u> , 20% = <u>8</u>	.2		41	= Total Cove	er	FACU species 11	4	x4 =	<u>456</u>	
Herb Stratum (Plot si			_			UPL species <u>0</u>	_	x5 =	<u>0</u>	
1. Polystichum mun			<u>3</u>	<u>yes</u>	FACU		<u>64</u> (A)		576 (B)	
2.	Itam		<u>u</u>	100	17100		alence Index = B/A =	= 3 7/	<u>070</u> (B)	
3.								- <u>3.74</u>		
						Hydrophytic Vegetation		Han		
4						1 – Rapid Test for H		.1011		
5						2 - Dominance Test				
6						☐ 3 - Prevalence Inde:	-			
7						4 - Morphological Ad	daptations1 (Provide	e support	iing	
8						_	or on a separate sh	ieet)		
9						5 - Wetland Non-Va	scular Plants¹			
10						☐ Problematic Hydrop	hytic Vegetation ¹ (F	Explain)		
11						¹ Indicators of hydric soil a	and westland budgets			
50% = <u>1.5</u> , 20% = <u>0.6</u>	<u>6</u>		<u>3</u>	= Total Cove	er	be present, unless disturb	,	gy musi		
Woody Vine Stratum	(Plot size: <u>15ft</u>)					•				
1										
2						Hydrophytic	V		NI-	5 7
50% =, 20% =				= Total Cove	er	Vegetation Present?	Yes		No	\boxtimes
% Bare Ground in He	erb Stratum <u>97</u>									
		List was used for t	his delineation	n.		l .				
i italiains.		r was on the gro			١.					

SOIL Sampling Point: WSE3-SP2 Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Depth Matrix Redox Features (inches) Color (moist) % Color (moist) % Type¹ Loc² Texture Remarks 10YR 3/2 medium to small gravel, trace OM* 0-16 <u>100</u> gravel loam ²Location: PL=Pore Lining, M=Matrix ¹Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils3: Histosol (A1) Sandy Redox (S5) 2 cm Muck (A10) Histic Epipedon (A2) Stripped Matrix (S6) Red Parent Material (TF2) Black Histic (A3) Loamy Mucky Mineral (F1) (except MLRA 1) Very Shallow Dark Surface (TF12) Hydrogen Sulfide (A4) Loamy Gleyed Matrix (F2) Other (Explain in Remarks) Depleted Below Dark Surface (A11) Depleted Matrix (F3) Thick Dark Surface (A12) Redox Dark Surface (F6) ³Indicators of hydrophytic vegetation and Sandy Mucky Mineral (S1) Depleted Dark Surface (F7) wetland hydrology must be present, \Box Sandy Gleyed Matrix (S4) Redox Depressions (F8) unless disturbed or problematic. Restrictive Layer (if present): **Hydric Soils Present?** \boxtimes Depth (inches): Yes No Remarks: *OM = organic matter Soils were dry. **HYDROLOGY** Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (2 or more required) Surface Water (A1) Water-Stained Leaves (B9) Water-Stained Leaves (B9) High Water Table (A2) (except MLRA 1, 2, 4A, and 4B) (MLRA 1, 2, 4A, and 4B) Saturation (A3) Salt Crust (B11) Drainage Patterns (B10) Water Marks (B1) Aquatic Invertebrates (B13) Dry-Season Water Table (C2) Sediment Deposits (B2) Hydrogen Sulfide Odor (C1) Saturation Visible on Aerial Imagery (C9) Drift Deposits (B3) Oxidized Rhizospheres along Living Roots (C3) Geomorphic Position (D2) Presence of Reduced Iron (C4) Shallow Aquitard (D3) П Algal Mat or Crust (B4) П П Iron Deposits (B5) Recent Iron Reduction in Tilled Soils (C6) FAC-Neutral Test (D5) Surface Soil Cracks (B6) Stunted or Stresses Plants (D1) (LRR A) Raised Ant Mounds (D6) (LRR A) Inundation Visible on Aerial Imagery (B7) Other (Explain in Remarks) Frost-Heave Hummocks (D7) Sparsely Vegetated Concave Surface (B8) Field Observations: Surface Water Present? \boxtimes Depth (inches): Yes No \boxtimes Water Table Present? Yes No Depth (inches): Saturation Present? Wetland Hydrology Present? No \boxtimes Yes No \boxtimes Depth (inches): Yes (includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks No hydrologic indicators.

Project Site:	West Seattle and Ballard Link Ex	<u>tensions</u>		City/County	-	Sampling Date:		8/23		24
Applicant/Owner:	Sound Transit				State: WA	Sampling Point:		WSE	E4-SF	<u>'1</u>
Investigator(s):	Amy Rotondo and Rose Whitson				Section, Township, Ra	_				
Landform (hillslope, ter				I relief (conca	ve, convex, none): <u>convex</u>		Slope		<u>15</u>	
Subregion (LRR):	<u>A</u>	Lat:	_		Long:		um: _			
Soil Map Unit Name:	Unclassified City Land			_	_		<u>SS</u>			
Are climatic / hydrologi	ic conditions on the site typical for	this time of y	ear? Ye	es 🛛	No	n in Remarks.)				
Are Vegetation □,	Soil □, or Hydrology [☐, signification	antly disturbed	? Are "N	ormal Circumstances" preser	ıt?	Yes	\boxtimes	No	
Are Vegetation \square ,	Soil □, or Hydrology [☐, naturall	y problematic?	(If nee	ded, explain any answers in I	Remarks.)				
	DINGS - Attach site map sh		· • · - ·	locations, t	ransects, important feat	ures, etc.				
Hydrophytic Vegetation	n Present?	Yes 🛚	No 🗆	Is the Sample	ed Area			_		_
Hydric Soil Present?	_	Yes 🛛	No 🗆	within a Wet		·	Yes	\boxtimes	No	
Wetland Hydrology Pre	esent?	Yes 🛛	No 🗆							
Remarks: 15 feet fro	om the retaining wall and 8 feet per	pendicular fro	om pavement.							
	se scientific names of plants	Absolute	Dominant	Indicator						
Tree Stratum (Plot si	ize: <u>30ft</u>)	% Cover	Species?	Status	Dominance Test Worksho	et:				
1					Number of Dominant Spec		<u>2</u>			(A)
2					That Are OBL, FACW, or F	AC:	_			(71)
3					Total Number of Dominant		<u>3</u>			(B)
4					Species Across All Strata:		<u> </u>			(D)
50% =, 20% =	=		= Total Cov	er	Percent of Dominant Speci		67			(A/B)
Sapling/Shrub Stratu	<u>ım</u> (Plot size: <u>15ft</u>)				That Are OBL, FACW, or F	AC:	<u></u>			(,,,,,
1. Rubus armeniaci	<u>us</u>	<u>100</u>	<u>yes</u>	<u>FAC</u>	Prevalence Index worksh					
2					Total % Cover	<u>of:</u>	Multip	ly by:		
3					OBL species	_	x1 =			
4					FACW species		x2 =			
5					FAC species	_	x3 =	_		
50% = <u>50</u> , 20% = <u>20</u>		<u>100</u>	= Total Cov	er	FACU species		x4 =			
Herb Stratum (Plot si	ize: <u>5ft</u>)				UPL species	_	x5 =			
1. Equisetum telma	<u>iteia</u>	<u>5</u>	<u>yes</u>	<u>FACW</u>	Column Totals:	(A)		_		(B)
2. Geranium roberti	<u>ianum</u>	<u>2</u>	<u>yes</u>	<u>FACU</u>	Prevale	nce Index = B/A =				
3					Hydrophytic Vegetation I	ndicators:				
4					☐ 1 – Rapid Test for Hy	drophytic Vegetati	on			
5						s >50%				
6					☐ 3 - Prevalence Index	is <3.01				
7					4 - Morphological Ad-	_	SUDDO	rtina		
8						or on a separate sh		rung		
9.					5 - Wetland Non-Vas	cular Plants1				
10					☐ Problematic Hydroph	vtic Vegetation¹ (F	xnlain)			
11.						y no vogotation (E	хрішіі)			
50% = 3.5, 20% = 1.4	.4	7	= Total Cov	er	¹Indicators of hydric soil an		y must	t		
Woody Vine Stratum	_	_			be present, unless disturbe	d or problematic.				
1										
2					Hydrophytic					
	=		= Total Cov	er	Vegetation	Yes ⊠		No	0	
				-	Present?					
		this delineati	on							
50% =, 20% = % Bare Ground in He		this delineati	= Total Cov on.	er	Vegetation Present?	Yes 🗵			0	

Project Site: West Seattle and Ballard Link Extensions

SOIL Sampling Point: WSE4-SP1 Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Depth Matrix Redox Features Color (moist) % Color (moist) % (inches) Type¹ Loc² Texture Remarks 10YR 2/1 <u>95</u> 10YR 3/6 <u>5</u> M, PL <u>0-18</u> <u>C</u> <u>loam</u> 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 Soils3: Sandy Redox (S5) Histosol (A1) 2 cm Muck (A10) Histic Epipedon (A2) Stripped Matrix (S6) Red Parent Material (TF2) Black Histic (A3) Loamy Mucky Mineral (F1) (except MLRA 1) Very Shallow Dark Surface (TF12) Hydrogen Sulfide (A4) Loamy Gleyed Matrix (F2) Other (Explain in Remarks) Depleted Below Dark Surface (A11) Depleted Matrix (F3) \boxtimes Redox Dark Surface (F6) Thick Dark Surface (A12) 3Indicators of hydrophytic vegetation and Sandy Mucky Mineral (S1) Depleted Dark Surface (F7) wetland hydrology must be present, Sandy Gleyed Matrix (S4) Redox Depressions (F8) unless disturbed or problematic. Restrictive Layer (if present): Type: Depth (inches): **Hydric Soils Present?** Yes \boxtimes No Remarks: Oxidized rhixospheres were present. Soil was textured with nitrile gloves, but some organic material may be present. **HYDROLOGY** Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (2 or more required) Surface Water (A1) Water-Stained Leaves (B9) Water-Stained Leaves (B9) \boxtimes High Water Table (A2) (except MLRA 1, 2, 4A, and 4B) (MLRA 1, 2, 4A, and 4B) \boxtimes Saturation (A3) Salt Crust (B11) Drainage Patterns (B10) Water Marks (B1) Aquatic Invertebrates (B13) Dry-Season Water Table (C2) Hydrogen Sulfide Odor (C1) Saturation Visible on Aerial Imagery (C9) Sediment Deposits (B2) П \boxtimes Drift Deposits (B3) Oxidized Rhizospheres along Living Roots (C3) Geomorphic Position (D2) Algal Mat or Crust (B4) Presence of Reduced Iron (C4) Shallow Aquitard (D3) Iron Deposits (B5) Recent Iron Reduction in Tilled Soils (C6) \boxtimes FAC-Neutral Test (D5) Surface Soil Cracks (B6) Stunted or Stresses Plants (D1) (LRR A) Raised Ant Mounds (D6) (LRR A) Inundation Visible on Aerial Imagery (B7) Other (Explain in Remarks) Frost-Heave Hummocks (D7) Sparsely Vegetated Concave Surface (B8) Field Observations: \boxtimes Surface Water Present? Yes No Depth (inches): Water Table Present? \boxtimes Depth (inches): Yes No 8" BGS* Saturation Present? Yes \boxtimes No Depth (inches): 0" BGS Wetland Hydrology Present? Yes \boxtimes No (includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: *BGS = below ground surface

Project Site: West Seattle and Ballard Link Ex	tensions		City/Coun	ty: <u>Seattle/King</u>	Sampling D		8/23		
Applicant/Owner: Sound Transit				State: <u>WA</u>	Sampling P			E4-SF	22
Investigator(s): Amy Rotondo and Rose Whitson				Section, Township, Ra	nge: <u>S13, T2</u>				
Landform (hillslope, terrace, etc.): <u>slope</u>		Local	relief (conca	ave, convex, none): <u>convex</u>		Slope	: (%):	<u>5</u>	
Subregion (LRR): <u>A</u>	Lat:	_		Long:		Datum: _			
Soil Map Unit Name: <u>Unclassified City Land</u>			_	_	assification:	<u>UPL</u>			
Are climatic / hydrologic conditions on the site typical for				,	in Remarks.)		_		_
		antly disturbed?		Normal Circumstances" preser		Yes	\boxtimes	No	
Are Vegetation □, Soil □, or Hydrology	□, naturall	y problematic?	(If ne	eded, explain any answers in F	Remarks.)				
CLIMANA A DV OF FINIDINGS. Added to the mean of			4:	4					
SUMMARY OF FINDINGS – Attach site map sh		· · ·	locations,	transects, important feat	ures, etc.				
Hydrophytic Vegetation Present?	Yes 🗆	No ⊠	ls the Samp	led Area		v	_		
Hydric Soil Present?	Yes 🗆		within a We	tland?		Yes		No	
Wetland Hydrology Present?	Yes 🗌	No 🛛							
Remarks:									
EGETATION – Use scientific names of plants	Absolute	Dominant	Indicator	-					
Tree Stratum (Plot size: 30ft)	% Cover	Species?	Status	Dominance Test Workshee	et:				
1. Acer macrophyllum	<u>80</u>	<u>yes</u>	<u>FACU</u>	Number of Dominant Specie		<u>1</u>			(A)
2				That Are OBL, FACW, or FA	iC:				(/ ()
3				Total Number of Dominant		<u>3</u>			(B)
4				Species Across All Strata:		<u> </u>			(5)
50% = <u>40</u> , 20% = <u>16</u>	<u>80</u>	= Total Cover	r	Percent of Dominant Specie		<u>33</u>			(A/B
Sapling/Shrub Stratum (Plot size: 15ft)				That Are OBL, FACW, or FA	iC:				(, , , _
1				Prevalence Index workshe	et:				
2				Total % Cover	of:	Multip	ly by:		
3				OBL species <u>0</u>		x1 =	0		
4				FACW species <u>0</u>		x2 =	<u>0</u>		
5				FAC species <u>10</u>		x3 =	<u>30</u>		
50% =, 20% =		= Total Cover	r	FACU species <u>116</u>		x4 =	<u>464</u>	<u>4</u>	
<u>Herb Stratum (</u> Plot size: <u>5ft</u>)				UPL species <u>0</u>		x5 =	<u>0</u>		
1. <u>Calystegia sepium</u>	<u>10</u>	<u>yes</u>	<u>FAC</u>	Column Totals: 126	(A)		<u>49</u> 4	<u>4</u> (B)	
2. Rubus leucodermis	<u>3</u>	<u>no</u>	<u>FACU</u>	Prevaler	nce Index = B/	A = <u>3.92</u>			
3. <u>Geranium robertianum</u>	<u>3</u>	<u>no</u>	<u>FACU</u>	Hydrophytic Vegetation In	dicators:				
4				☐ 1 – Rapid Test for Hyd	Irophytic Vege	tation			
5				☐ 2 - Dominance Test is	>50%				
6				☐ 3 - Prevalence Index is	s <3.0 ¹				
7				4 - Morphological Ada	_ otations¹ (Prov	/ide suppo	rtina		
8				data in Remarks or			9		
9				☐ 5 - Wetland Non-Vasc	ular Plants¹				
10				☐ Problematic Hydrophy	tic Vegetation¹	¹ (Explain)			
11.					· - y	(=)			
50% = <u>8</u> , 20% = <u>3.2</u>	<u>16</u>	= Total Cover	 r	¹Indicators of hydric soil and					
Woody Vine Stratum (Plot size: 15ft)				be present, unless disturbed	or problemati	.C.			
	<u>30</u>	<u>yes</u>	FACU						
Hedera helix				Hydrophytic					
									\boxtimes
2	30	= Total Cove	 r	Vegetation	Yes		No)	
	<u>30</u>	= Total Cover		Vegetation Present?	Yes		No)	

Project Site: West Seattle and Ballard Link Extensions

OIL				ofium the checker					
Profile Description: (Describ	e to the dept	h needed to d	ocument the indicator or cor	mrm the absence of	of indicators.)				
Depth Mati	ix		Redox Features						
(inches) Color (moist)	%	Color (mo	vist) % Type ¹	Loc ²	Texture		Remarks		
<u>0-18</u> <u>10YR 2/2</u>					gr sa loam*	<u>1*</u>			
						_			
						_			
						_			
						_			
						_			
						_			
						_			
Type: C= Concentration, D=[epletion, RM=	Reduced Matr	ix, CS=Covered or Coated Sa	nd Grains. ² Loc	ation: PL=Pore Lining	ı, M=Matrix			
Hydric Soil Indicators: (App	licable to all L	RRs, unless	otherwise noted.)		Indicators for P	roblematic l	Hydric S	oils³:	
☐ Histosol (A1)			Sandy Redox (S5)		☐ 2 cm Muc	ck (A10)			
☐ Histic Epipedon (A2)			Stripped Matrix (S6)		☐ Red Pare	ent Material (TF2)		
☐ Black Histic (A3)			Loamy Mucky Mineral (F1) (except MLRA 1)	☐ Very Sha	illow Dark Su	ırface (TF	12)	
☐ Hydrogen Sulfide (A4)			Loamy Gleyed Matrix (F2)		Other (Ex	xplain in Rem	narks)		
☐ Depleted Below Dark S	urface (A11)		Depleted Matrix (F3)						
☐ Thick Dark Surface (A1:	2)		Redox Dark Surface (F6)						
☐ Sandy Mucky Mineral (S	S1)		Depleted Dark Surface (F7)		3Indicators of hy				
☐ Sandy Gleyed Matrix (S	4)		Redox Depressions (F8)		wetland hydro unless disturb			,	
Restrictive Layer (if present):					•			
Гуре:									
				Hydric Soils Pre	esent?	Yes		No	\boxtimes
				riyunt sons riv					
Wood chips pre	sent in top 6 in			nyunc sons riv					
*gr sa loam = gr Wood chips pre YDROLOGY Wetland Hydrology Indicato	sent in top 6 in	iches.	t opply)	riyunc sons riv	Secondary Indicate	toro /2 or mo	ro roquiro	d)	
Remarks: *gr sa loam = gr Wood chips pre YDROLOGY Wetland Hydrology Indicato Primary Indicators (minimum o	sent in top 6 in	t; check all tha		nyunc sons riv	Secondary Indicat			ed)	
*gr sa loam = gr Wood chips pre YDROLOGY Wetland Hydrology Indicato Primary Indicators (minimum of	sent in top 6 in	iches.	Water-Stained Leaves (B9)		☐ Water-Stain	ed Leaves (E	39)	d)	
*gr sa loam = gr Wood chips pre YDROLOGY Wetland Hydrology Indicato Primary Indicators (minimum of the company of the comp	sent in top 6 in	d; check all tha	Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and		Water-Stain	ed Leaves (E	39))	d)	
*gr sa loam = gr Wood chips pre *YDROLOGY *Wetland Hydrology Indicato Primary Indicators (minimum of the company Indicators (Minimum of the company Indicators (Manimum of the company Indic	sent in top 6 in	d; check all tha	Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and Salt Crust (B11)		Water-Stain (MLRA 1, 2,	ed Leaves (E , 4A , and 4B atterns (B10)	39))	d)	
*gr sa loam = gr Wood chips pre *YDROLOGY *Wetland Hydrology Indicato Primary Indicators (minimum of Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1)	rs: of one required	d; check all tha	Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and Salt Crust (B11) Aquatic Invertebrates (B13)	1 4B)	Water-Stain- (MLRA 1, 2, Drainage Pa	ed Leaves (E , 4A , and 4B atterns (B10) Water Table	39))		
*gr sa loam = gr Wood chips pre *YDROLOGY *Wetland Hydrology Indicato Primary Indicators (minimum of Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2)	rs: of one required	d; check all that	Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1)	I 4B)	Water-Stain (MLRA 1, 2, Drainage Pa Dry-Season Saturation V	ed Leaves (E , 4A, and 4B atterns (B10) Water Table visible on Aer	(C2) ital Image		
YDROLOGY Wetland Hydrology Indicato Primary Indicators (minimum of the state of t	rs: of one required	d; check all tha	Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along	I 4B)	□ Water-Stain (MLRA 1, 2, □ Drainage Pa □ Dry-Season □ Saturation V □ Geomorphic	ed Leaves (E , 4A, and 4B atterns (B10) Water Table (isible on Aer Position (D2	(C2) ital Image		
*gr sa loam = gr Wood chips pre *YDROLOGY *Wetland Hydrology Indicato Primary Indicators (minimum of the color of the c	rs: of one required	d; check all that	Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Presence of Reduced Iron (C	g Living Roots (C3)	□ Water-Stain (MLRA 1, 2, □ Drainage Pa □ Dry-Season □ Saturation V □ Geomorphic □ Shallow Aqu	ed Leaves (E , 4A, and 4B atterns (B10) Water Table Visible on Aer Position (D2 uitard (D3)	(C2) ital Image		
*gr sa loam = gr Wood chips pre *YDROLOGY Wetland Hydrology Indicato Primary Indicators (minimum of the control of the cont	rs: of one required	d; check all tha	Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Presence of Reduced Iron (CRecent Iron Reduction in Till	g Living Roots (C3) C4) ed Soils (C6)	☐ Water-Stain (MLRA 1, 2, ☐ Drainage Pa ☐ Dry-Season ☐ Saturation V ☐ Geomorphic ☐ Shallow Aqu ☐ FAC-Neutra	ed Leaves (E , 4A, and 4B atterns (B10) Water Table /isible on Aer c Position (D2 uitard (D3) I Test (D5)	39) (C2) rial Image	ry (C9)	
*gr sa loam = gr Wood chips pre *YDROLOGY *Wetland Hydrology Indicato Primary Indicators (minimum of the company Indicators (minimum of the company Indicators (Material) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Surface Soil Cracks (B6)	rs: of one required	d; check all that	Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Presence of Reduced Iron (CRecent Iron Reduction in Till Stunted or Stresses Plants (CRECENT IRON PROBLEM 1)	g Living Roots (C3) C4) ed Soils (C6)	Water-Stain (MLRA 1, 2, Drainage Pa Dry-Season Saturation V Geomorphic Shallow Aqu FAC-Neutra Raised Ant I	ed Leaves (E 4A, and 4B atterns (B10) Water Table (isible on Aer Position (D2 uitard (D3) I Test (D5) Mounds (D6)	(C2) ital Image	ry (C9)	
*gr sa loam = gr Wood chips pre *YDROLOGY *Wetland Hydrology Indicato Primary Indicators (minimum of the company of the com	rs: of one required in top 6 in	d; check all that	Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Presence of Reduced Iron (CRecent Iron Reduction in Till	g Living Roots (C3) C4) ed Soils (C6)	Water-Stain (MLRA 1, 2, Drainage Pa Dry-Season Saturation V Geomorphic Shallow Aqu FAC-Neutra Raised Ant I	ed Leaves (E , 4A, and 4B atterns (B10) Water Table /isible on Aer c Position (D2 uitard (D3) I Test (D5)	(C2) ital Image	ry (C9)	
YDROLOGY Wetland Hydrology Indicator Primary Indicators (minimum of the primary Indicators (Male primary Indi	rs: of one required in top 6 in	d; check all that	Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Presence of Reduced Iron (CRecent Iron Reduction in Till Stunted or Stresses Plants (CRECENT IRON PROBLEM 1)	g Living Roots (C3) C4) ed Soils (C6)	Water-Stain (MLRA 1, 2, Drainage Pa Dry-Season Saturation V Geomorphic Shallow Aqu FAC-Neutra Raised Ant I	ed Leaves (E 4A, and 4B atterns (B10) Water Table (isible on Aer Position (D2 uitard (D3) I Test (D5) Mounds (D6)	(C2) ital Image	ry (C9)	
*gr sa loam = gr Wood chips pre *YDROLOGY *Wetland Hydrology Indicato Primary Indicators (minimum of the control of the con	rs: of one required i) ii) iii) iii) iii)	d; check all that	Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Presence of Reduced Iron (C Recent Iron Reduction in Till Stunted or Stresses Plants (C) Other (Explain in Remarks)	g Living Roots (C3) C4) ed Soils (C6)	Water-Stain (MLRA 1, 2, Drainage Pa Dry-Season Saturation V Geomorphic Shallow Aqu FAC-Neutra Raised Ant I	ed Leaves (E 4A, and 4B atterns (B10) Water Table (isible on Aer Position (D2 uitard (D3) I Test (D5) Mounds (D6)	(C2) ital Image	ry (C9)	
*gr sa loam = gr Wood chips pre *YDROLOGY *Wetland Hydrology Indicato Primary Indicators (minimum of the color of the c	rs: of one required S) erial Imagery (ncave Surface	d; check all tha	Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Presence of Reduced Iron (C) Recent Iron Reduction in Till Stunted or Stresses Plants (C) Other (Explain in Remarks)	g Living Roots (C3) C4) ed Soils (C6)	Water-Stain (MLRA 1, 2, Drainage Pa Dry-Season Saturation V Geomorphic Shallow Aqu FAC-Neutra Raised Ant I	ed Leaves (E 4A, and 4B atterns (B10) Water Table (isible on Aer Position (D2 uitard (D3) I Test (D5) Mounds (D6)	(C2) ital Image	ry (C9)	
*gr sa loam = gr Wood chips pre *YDROLOGY *Wetland Hydrology Indicator *Primary Indicators (minimum of the color of the	rs: of one required i) ii) iii) iii) iii)	d; check all that	Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Presence of Reduced Iron (C Recent Iron Reduction in Till Stunted or Stresses Plants (C) Other (Explain in Remarks)	g Living Roots (C3) C4) ed Soils (C6)	Water-Stain (MLRA 1, 2, Drainage Pa Dry-Season Saturation V Geomorphic Shallow Aqu FAC-Neutra Raised Ant I	ed Leaves (E 4A, and 4B atterns (B10) Water Table (isible on Aer Position (D2 uitard (D3) I Test (D5) Mounds (D6)	(C2) ital Image	ry (C9)	
*gr sa loam = gr Wood chips pre *YDROLOGY *Wetland Hydrology Indicato Primary Indicators (minimum of Marker (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Surface Soil Cracks (B6) Inundation Visible on A Sparsely Vegetated Co Field Observations: Surface Water Present? Water Table Present? Saturation Present? includes capillary fringe)	rs: of one required in top 6 in in	d; check all that	Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Presence of Reduced Iron (C) Recent Iron Reduction in Till Stunted or Stresses Plants (C) Other (Explain in Remarks)	g Living Roots (C3) C4) ed Soils (C6) D1) (LRR A) Wetla	Water-Stain (MLRA 1, 2, Drainage Pa Dry-Season Saturation V Geomorphic Shallow Aqu FAC-Neutra Raised Ant I	ed Leaves (E , 4A, and 4B atterns (B10) Water Table /isible on Aer Position (D2 uitard (D3) I Test (D5) Mounds (D6) e Hummocks	(C2) ital Image	ry (C9)	o 🛛
*gr sa loam = gr Wood chips pre *YDROLOGY *Wetland Hydrology Indicato Primary Indicators (minimum of Marker (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Surface Soil Cracks (B6) Inundation Visible on A Sparsely Vegetated Co Field Observations: Surface Water Present? Water Table Present? Saturation Present? includes capillary fringe)	rs: of one required in top 6 in in	d; check all that	Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Presence of Reduced Iron (C) Recent Iron Reduction in Till Stunted or Stresses Plants (C) Other (Explain in Remarks) Depth (inches): Depth (inches):	g Living Roots (C3) C4) ed Soils (C6) D1) (LRR A) Wetla	□ Water-Stain (MLRA 1, 2, □ Drainage Pa □ Dry-Season □ Saturation V □ Geomorphic □ Shallow Aqu □ FAC-Neutra □ Raised Ant I □ Frost-Heave	ed Leaves (E , 4A, and 4B atterns (B10) Water Table /isible on Aer Position (D2 uitard (D3) I Test (D5) Mounds (D6) e Hummocks	(C2) ial Image (C2) (LRR A)	ry (C9)	o 🛛
*gr sa loam = gr Wood chips pre *YDROLOGY *Wetland Hydrology Indicato Primary Indicators (minimum of Marker (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Surface Soil Cracks (B6) Inundation Visible on A Sparsely Vegetated Co Field Observations: Surface Water Present? Water Table Present? Saturation Present? includes capillary fringe)	rs: of one required in top 6 in in	d; check all that	Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and Salt Crust (B11) Aquatic Invertebrates (B13) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Presence of Reduced Iron (C) Recent Iron Reduction in Till Stunted or Stresses Plants (C) Other (Explain in Remarks) Depth (inches): Depth (inches):	g Living Roots (C3) C4) ed Soils (C6) D1) (LRR A) Wetla	□ Water-Stain (MLRA 1, 2, □ Drainage Pa □ Dry-Season □ Saturation V □ Geomorphic □ Shallow Aqu □ FAC-Neutra □ Raised Ant I □ Frost-Heave	ed Leaves (E , 4A, and 4B atterns (B10) Water Table /isible on Aer Position (D2 uitard (D3) I Test (D5) Mounds (D6) e Hummocks	(C2) ial Image (C2) (LRR A)	ry (C9)	• ⊠

Project Site:	West Sea	attle ai	nd Ballard Link I	Extensior	<u>IS</u>			City/County	: Seattle/King		Sampling	Date:	8/23	<u>3/19</u>	
Applicant/Owner:	Sound Tr	ransit							St	tate: WA	Sampling	Point:	WS	E4-SP	<u>3</u>
Investigator(s):	Amy Rote	ondo a	and Rose Whitso	<u>on</u>					Section, To	ownship, Rar	nge: <u>S13, T</u>	24N, R03E	_		
Landform (hillslope, te	rrace, etc.): <u>t</u>	oe of slope				Loc	al relief (concav	ve, convex, none)	: <u>convex</u>		Slope	e (%):	2	
Subregion (LRR):	<u>A</u>			Lat:		_			Long:			Datum: _			
Soil Map Unit Name:	Unclass	sified (City Land							NWI clas	ssification:	PEM			
Are climatic / hydrolog	ic conditio	ns on	the site typical f	or this tin	ne of y	ear?	`	∕es ⊠	No 🗌 (I	f no, explain	in Remarks.)			
Are Vegetation	, Soil	□,	or Hydrology	□, s	gnific	antly di	sturbe	d? Are "N	ormal Circumstan	nces" present	?	Yes	\boxtimes	No	
Are Vegetation	, Soil	□,	or Hydrology	□, n	aturall	y probl	ematio	? (If nee	ded, explain any a	answers in R	emarks.)				
SUMMARY OF FIN			ch site map s	showing	g san	pling		t locations, t	ransects, impo	ortant featu	ıres, etc.				
Hydrophytic Vegetatio	n Present	?		Yes	\boxtimes	No		Is the Sample	nd Aroa						
Hydric Soil Present?				Yes	\boxtimes	No		within a Wetl				Yes	\boxtimes	No	
Wetland Hydrology Pr	esent?			Yes		No									
Remarks:															
VEGETATION - U	se scient	ific n	ames of plan		. 1 4	D		la dia atau	Γ						
Tree Stratum (Plot s	size: <u>30ft</u>)			Abso <u>% C</u>			ninant cies?	Indicator Status	Dominance Te	st Workshe	et:				
1					_				Number of Dom	ninant Specie	es	0			(\\\
2					_				That Are OBL,	FACW, or FA	NC:	<u>0</u>			(A)
3					_				Total Number of	of Dominant		<u>1</u>			(B)
4					_				Species Across	All Strata:					(D)
50% =, 20%	=				_	= To	tal Co	ver	Percent of Dom			0			(A/B)
Sapling/Shrub Strate	<u>um</u> (Plot si	ze: <u>15</u>	<u>ft</u>)						That Are OBL,	FACW, or FA	NC:	<u> </u>			(700)
1					_				Prevalence Inc	dex workshe	et:				
2					_				<u>To</u>	tal % Cover	of:	<u>Multi</u>	ply by	<u>':</u>	
3					_				OBL species		_	x1 =	_		
4					_				FACW species	<u>5</u>		x2 =	<u>10</u>	<u>)</u>	
5				_	_				FAC species		_	x3 =	_		
50% =, 20%	=				_	= To	tal Co	ver	FACU species	<u>100</u>		x4 =	40	00	
Herb Stratum (Plot s	size: <u>5ft</u>)								UPL species		_	x5 =	_		
1. Parietaria pensy	<u>Ivanica</u>			<u>100</u>		yes		<u>FACU</u>	Column Totals:	<u>105</u>	(A)		4	<u>10</u> (B)	
2. Equisetum telma	ateia			<u>5</u>		<u>no</u>		<u>FACW</u>		Prevale	nce Index =	B/A = 3.9			
3					_				Hydrophytic V	egetation In	dicators:				
4					_				☐ 1 – Rapid	Test for Hyd	Irophytic Ve	getation			
5					_				☐ 2 - Domin	nance Test is	>50%				
6					_				☐ 3 - Preval	lence Index is	s <3.0 ¹				
7									4 - Morph	nological Ada	_ otations¹ (Pr	ovide supp	ortina		
8					_					n Remarks or	١ ,				
9					_				☐ 5 - Wetlar	nd Non-Vasc	ular Plants1				
10					_				☐ Problema	itic Hydrophy	tic Vegetatio	n¹ (Explain)		
11										, , ,	J	` '	,		
50% = <u>52.5</u> , 20% =	<u>21</u>			105		= To	tal Co	ver	¹ Indicators of hybe present, unle				st		
Woody Vine Stratun	n_(Plot size	e: <u>15ft</u>)							be present, unit	ess disturbed	i di piobleilia	auc.			
1					_										
2.									Hydrophytic			_			_
50% =, 20%	=				_	= To	tal Co	ver	Vegetation Present?		Yes		N	lo	
% Bare Ground in H		m	_						riesent?						
			List was used f	or this de	lineati	on.			<u> </u>						
Remarks:							that h	as likely out-co	mpeted native we	etland vegeta	tion.				

Project Site: West Seattle and Ballard Link Extensions

OIL										Sam	npling Poi	int: WSE	4-SP3			
Profile Descr	iption: (Describ	e to the	e depth	neede	d to d	ocument the indicato	r or con	nfirm the abse	nce of indica	ators.)						
Depth	Matri	x				Redox Feat	ures									
(inches)	Color (moist)		%	Cold	or (mo	ist) %	Type ¹	Loc ²	Textu	re			Remark	ks		
<u>0-10</u>	10YR 3/1		100	_					sandy	loam -						
<u>10-16</u>	10YR 4/1		<u>97</u>	10	YR 4/6	<u>3</u>	<u>C</u>	<u>M</u>	clay lo	<u>oam</u>						
		_		_						_						
		_		_						_						
		_		_												
		_		_						_						
		_		_						_						
				_												
Гуре: С= Сог	ncentration, D=D	epletion	n, RM=F	Reduced	d Matri	ix, CS=Covered or Co	ated Sar	nd Grains.	² Location: Pl	L=Pore L	ining, M=	=Matrix				
lydric Soil Ir	dicators: (Appl	icable t	to all LF	RRs, un	less o	otherwise noted.)			Inc	licators	for Probl	lematic	Hydric	Soils	s³:	
Histosol	(A1)					Sandy Redox (S5)				2 cm	n Muck (A	A10)	-			
_	pipedon (A2)					Stripped Matrix (S6)					Parent M		(TF2)			
_	istic (A3)					Loamy Mucky Minera	al (F1) (e	except MLRA			/ Shallow			TF12)	
_	en Sulfide (A4)					Loamy Gleyed Matrix		•			er (Explai		•			
, ,	d Below Dark Su	ırface (A	A11)		⊠	Depleted Matrix (F3)			_		, [3.	-=	-,			
	ark Surface (A12	,	,			Redox Dark Surface										
_	/lucky Mineral (S					Depleted Dark Surfa			3In	dicators	of hydrop	hytic ve	getation	and		
_	Gleyed Matrix (S4	-				Redox Depressions	. ,				hydrology isturbed			nt,		
	ayer (if present)					Trodox Boprodolono	(1 0)			uniess u	isturbea	or proble	ematic.			
ype:	ayor (ii procont)	•														
epth (inches	\.							Hudria Sail	s Present?			Yes	\boxtimes		lo	
	Redoximorphic fo	eatures	were di	iffuse.												
Remarks:	Redoximorphic fo	eatures	were di	iffuse.												
Remarks:	Redoximorphic fo		were di	iffuse.												
Remarks: /DROLOGY Vetland Hydr	Redoximorphic fo	rs:			all that	apply)		, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Seco	ondary In	ndicators (
CDROLOGY Vetland Hydi Primary Indica	Redoximorphic for	rs:			all that	apply) Water-Stained Leave	es (B9)		Seco		idicators ((2 or mo	re requi			
COROLOGY Vetland Hydi rimary Indica Surface	Redoximorphic for follogy Indicator stors (minimum o	rs:								Water-9		(2 or mo	ore requi			
YDROLOGY Vetland Hydi rimary Indica Surface High W	Redoximorphic for rology Indicator tors (minimum o	rs:				Water-Stained Leave				Water-S	Stained L	(2 or mo eaves (E , and 4B	ore requi 39)			
ZDROLOGY Wetland Hydrimary Indica Surface High W. Saturati	rology Indicator stors (minimum o w Water (A1) ater Table (A2)	rs:				Water-Stained Leave (except MLRA 1, 2,	4A, and			Water-S (MLRA Drainag	Stained L.	(2 or mo eaves (E , and 4B ns (B10)	ore requi 39)			
YDROLOGY Vetland Hydrimary Indica □ Surface □ High W ☑ Saturati □ Water M	rology Indicator ators (minimum o Water (A1) ater Table (A2) ion (A3)	's: f one re				Water-Stained Leave (except MLRA 1, 2, Salt Crust (B11)	4A, and			Water-S (MLRA Drainag	Stained L 1, 2, 4A, ge Patterr	(2 or mo eaves (E , and 4B ns (B10) ter Table	ore requi 39) 3) e (C2)	ired)		
PROLOGY Vetland Hydi Primary Indica Surface High W Saturati Water № Sedime	rology Indicator stors (minimum o water (A1) ater Table (A2) ion (A3) Marks (B1)	's: f one re				Water-Stained Leave (except MLRA 1, 2, Salt Crust (B11) Aquatic Invertebrates	4A, and s (B13) dor (C1)	4B)		Water-S (MLRA Drainag Dry-Sea Saturat	Stained L. 1, 2, 4A, ge Patterrason Wat	(2 or mo eaves (E , and 4B ns (B10) ter Table le on Ael	ore requi 39) 3) e (C2) rial Imaç	ired)		
YDROLOGY Vetland Hydi Primary Indica □ Surface □ High W ⊠ Saturati □ Water M □ Sedime □ Drift De	rology Indicator tors (minimum o Water (A1) ater Table (A2) ion (A3) Marks (B1)	's: f one re				Water-Stained Leave (except MLRA 1, 2, Salt Crust (B11) Aquatic Invertebrates Hydrogen Sulfide Od	4A, and s (B13) dor (C1) res along	4B)		Water-S (MLRA Drainag Dry-Sea Saturat Geomo	Stained L 1, 2, 4A, ge Patterr ason Wat ion Visibl	(2 or mo eaves (E , and 4B ns (B10) ter Table le on Aer sition (D2	ore requi 39) 3) e (C2) rial Imaç	ired)		
YDROLOGY Vetland Hydri Surface High W Saturati Water M Sedime Drift De Algal M	rology Indicator stors (minimum o water (A1) ater Table (A2) ion (A3) Marks (B1) ent Deposits (B2)	's: f one re				Water-Stained Leave (except MLRA 1, 2, Salt Crust (B11) Aquatic Invertebrates Hydrogen Sulfide Od Oxidized Rhizospher	4A, and s (B13) dor (C1) res along d Iron (C	4B) g Living Roots (24)		Water-S (MLRA Drainag Dry-Sea Saturat Geomo Shallow	Stained L. 1, 2, 4A, ge Patterrason Wation Visible or Pos	(2 or mo eaves (E , and 4B ns (B10) ter Table le on Ael sition (D2	ore requi 39) 3) e (C2) rial Imaç	ired)		
/DROLOGY Vetland Hydro Primary Indica ☐ Surface ☐ High W ☑ Saturati ☐ Water M ☐ Sedime ☐ Drift De ☐ Algal M ☐ Iron De	rology Indicator tors (minimum o Water (A1) ater Table (A2) ion (A3) Marks (B1) int Deposits (B2) reposits (B3) at or Crust (B4)	rs: f one re				Water-Stained Leave (except MLRA 1, 2, Salt Crust (B11) Aquatic Invertebrates Hydrogen Sulfide Od Oxidized Rhizospher Presence of Reduce	4A, and s (B13) flor (C1) res along d Iron (C	4B) g Living Roots (24) ed Soils (C6)		Water-S (MLRA Drainag Dry-Sea Saturat Geomo Shallow FAC-Ne	Stained L. 1, 2, 4A, ge Patterr ason Wation Visible or phic Posev Aquitare	(2 or mo eaves (E , and 4B ns (B10) ter Table le on Aei sition (D2 d (D3) st (D5)	ore requi 39) 5) e (C2) rial Imaç 2)	ired)		
YDROLOGY Vetland Hydro Primary Indica ☐ Surface ☐ High W ☐ Saturati ☐ Water M ☐ Sedime ☐ Drift De ☐ Algal M ☐ Iron De ☐ Surface	rology Indicator ators (minimum o e Water (A1) ater Table (A2) ion (A3) Marks (B1) ent Deposits (B2) eposits (B3) at or Crust (B4) posits (B5)	rs: If one re	equired;	check a		Water-Stained Leave (except MLRA 1, 2, Salt Crust (B11) Aquatic Invertebrates Hydrogen Sulfide Od Oxidized Rhizospher Presence of Reduce Recent Iron Reduction	4A, and s (B13) dor (C1) res along d Iron (C on in Tille Plants (E	4B) g Living Roots (24) ed Soils (C6)	C3)	Water-S (MLRA Drainag Dry-Sei Saturat Geomo Shallow FAC-Nei Raised	Stained L 1, 2, 4A, ge Patterr ason Wat tion Visibl orphic Pos v Aquitarc eutral Tes	(2 or mo eaves (E , and 4B ns (B10) ter Table le on Ael sition (D2 d (D3) st (D5) nds (D6)	ore requi 39) 3) e (C2) rial Imaç 2)	ired)		
Commarks: **Commary Indication Surface**	rology Indicator ators (minimum of water (A1) ater Table (A2) ion (A3) Marks (B1) ent Deposits (B3) at or Crust (B4) posits (B5) e Soil Cracks (B6	rs: If one re	equired;	check a		Water-Stained Leave (except MLRA 1, 2, Salt Crust (B11) Aquatic Invertebrates Hydrogen Sulfide Od Oxidized Rhizospher Presence of Reduce Recent Iron Reduction Stunted or Stresses	4A, and s (B13) dor (C1) res along d Iron (C on in Tille Plants (E	4B) g Living Roots (24) ed Soils (C6)	C3)	Water-S (MLRA Drainag Dry-Sei Saturat Geomo Shallow FAC-Nei Raised	Stained L. 1, 2, 4A, ge Patterrason Wation Visible or Pos v Aquitaro eutral Tes Ant Moun	(2 or mo eaves (E , and 4B ns (B10) ter Table le on Ael sition (D2 d (D3) st (D5) nds (D6)	ore requi 39) 3) e (C2) rial Imaç 2)	ired)		
Primary Indication of the primary Indicatio	rology Indicator stors (minimum o water (A1) ater Table (A2) ion (A3) Marks (B1) and Deposits (B2) ator Crust (B4) posits (B5) a Soil Cracks (B6 ion Visible on Ae ly Vegetated Cor	rs: If one re	equired;	check a		Water-Stained Leave (except MLRA 1, 2, Salt Crust (B11) Aquatic Invertebrates Hydrogen Sulfide Od Oxidized Rhizospher Presence of Reduce Recent Iron Reduction Stunted or Stresses	4A, and s (B13) dor (C1) res along d Iron (C on in Tille Plants (E	4B) g Living Roots (24) ed Soils (C6)	C3)	Water-S (MLRA Drainag Dry-Sei Saturat Geomo Shallow FAC-Nei Raised	Stained L. 1, 2, 4A, ge Patterrason Wation Visible or Pos v Aquitaro eutral Tes Ant Moun	(2 or mo eaves (E , and 4B ns (B10) ter Table le on Ael sition (D2 d (D3) st (D5) nds (D6)	ore requi 39) 3) e (C2) rial Imaç 2)	ired)		
Properties of the control of the co	rology Indicator attors (minimum o Water (A1) ater Table (A2) ion (A3) Marks (B1) int Deposits (B2) reposits (B3) at or Crust (B4) posits (B5) e Soil Cracks (B6 ion Visible on Ae by Vegetated Cor ations:	rs: If one re	equired;	check a		Water-Stained Leave (except MLRA 1, 2, Salt Crust (B11) Aquatic Invertebrates Hydrogen Sulfide Od Oxidized Rhizospher Presence of Reduce Recent Iron Reduction Stunted or Stresses	4A, and s (B13) dor (C1) res along d Iron (C on in Tille Plants (E	4B) g Living Roots (24) ed Soils (C6)	C3)	Water-S (MLRA Drainag Dry-Sei Saturat Geomo Shallow FAC-Nei Raised	Stained L. 1, 2, 4A, ge Patterrason Wation Visible or Pos v Aquitaro eutral Tes Ant Moun	(2 or mo eaves (E , and 4B ns (B10) ter Table le on Ael sition (D2 d (D3) st (D5) nds (D6)	ore requi 39) 3) e (C2) rial Imaç 2)	ired)		
VDROLOGY Vetland Hydrimary Indication Surface High W Saturati Sedime Drift De Algal M Iron De Surface Inundat Sparsel	rology Indicator ators (minimum of Water (A1) ater Table (A2) ion (A3) Marks (B1) ant Deposits (B2) ator Crust (B4) posits (B5) a Soil Cracks (B6 ion Visible on Ae by Vegetated Cor ations: r Present?	rs: If one re	equired; agery (B Surface (check a		Water-Stained Leave (except MLRA 1, 2, Salt Crust (B11) Aquatic Invertebrates Hydrogen Sulfide Od Oxidized Rhizospher Presence of Reduce Recent Iron Reduction Stunted or Stresses Other (Explain in Res	4A, and s (B13) dor (C1) res along d Iron (C on in Tille Plants (E	4B) g Living Roots (24) ed Soils (C6)	C3)	Water-S (MLRA Drainag Dry-Sei Saturat Geomo Shallow FAC-Nei Raised	Stained L. 1, 2, 4A, ge Patterrason Wation Visible or Pos v Aquitaro eutral Tes Ant Moun	(2 or mo eaves (E , and 4B ns (B10) ter Table le on Ael sition (D2 d (D3) st (D5) nds (D6)	ore requi 39) 3) e (C2) rial Imaç 2)	ired)		
YDROLOGY Wetland Hydi Primary Indica ☐ Surface ☐ High W ☒ Saturati ☐ Water M ☐ Sedime ☐ Drift De ☐ Algal M ☐ Iron De ☐ Surface ☐ Inundat	rology Indicator ators (minimum of Water (A1) ater Table (A2) ator (A3) Marks (B1) ator Crust (B4) posits (B5) at or Crust (B4) posits (B5) ator Crust	rs: If one re If one	equired; agery (B	check a 27) (B8) No		Water-Stained Leave (except MLRA 1, 2, Salt Crust (B11) Aquatic Invertebrates Hydrogen Sulfide Od Oxidized Rhizospher Presence of Reduce Recent Iron Reduction Stunted or Stresses Other (Explain in Res	4A, and s (B13) for (C1) res along d Iron (C on in Tille Plants (E marks)	4B) g Living Roots (24) ed Soils (C6) D1) (LRR A)	C3)	Water-S (MLRA Drainag Dry-Sea Saturat Geomo Shallow FAC-Ne Raised Frost-H	Stained L. 1, 2, 4A, ge Patterr ason Wat ion Visibl urphic Pos v Aquitaro eutral Tes Ant Mour leave Hur	(2 or mo eaves (E , and 4B ns (B10) ter Table le on Aer sition (D2 d (D3) st (D5) nds (D6) mmocks	ore requi 39) 3) e (C2) rial Imaç 2)	ired)	C9)	
YDROLOGY Wetland Hydro Primary Indicator Surface High W Saturati Sedime Drift De Drift De Surface Inundat Sparsel Field Observa Surface Water Nater Table P Saturation Presincludes capil	rology Indicator ators (minimum of Water (A1) ater Table (A2) ion (A3) Marks (B1) ant Deposits (B3) at or Crust (B4) posits (B5) e Soil Cracks (B6 ion Visible on Ae by Vegetated Cor ations: r Present? esent? elsent?	rs: If one re Perial Imancave S Yes Yes Yes	equired; agery (B Surface (check a (77) (88) No No No		Water-Stained Leave (except MLRA 1, 2, Salt Crust (B11) Aquatic Invertebrates Hydrogen Sulfide Oct Oxidized Rhizospher Presence of Reduces Recent Iron Reduction Stunted or Stresses Other (Explain in Research Inches): Depth (inches):	4A, and s (B13) dor (C1) res along d Iron (C on in Tille Plants (E marks)	4B) g Living Roots (C4) ed Soils (C6) D1) (LRR A)	C3)	Water-S (MLRA Drainag Dry-Sea Saturat Geomo Shallow FAC-Ne Raised Frost-H	Stained L. 1, 2, 4A, ge Patterr ason Wat ion Visibl urphic Pos v Aquitaro eutral Tes Ant Mour leave Hur	(2 or mo eaves (E , and 4B ns (B10) ter Table le on Aer sition (D2 d (D3) st (D5) nds (D6) mmocks	ore requi 39) (i) e (C2) rial Imag 2) (LRR /	gery (C9)	
Primary Indicated Services Water Nater Table Positional Presidence Water Water Table Positional Presidence Services Presidence Water Table Positional Presidence Services Presidence Pres	rology Indicator ators (minimum of Water (A1) ater Table (A2) ion (A3) Marks (B1) ant Deposits (B3) at or Crust (B4) posits (B5) e Soil Cracks (B6 ion Visible on Ae by Vegetated Cor ations: r Present? esent? elsent?	rs: If one re Perial Imancave S Yes Yes Yes	equired; agery (B Surface (check a (77) (88) No No No		Water-Stained Leave (except MLRA 1, 2, Salt Crust (B11) Aquatic Invertebrates Hydrogen Sulfide Octo Oxidized Rhizospher Presence of Reducer Recent Iron Reduction Stunted or Stresses Other (Explain in Ref Depth (inches): Depth (inches):	4A, and s (B13) dor (C1) res along d Iron (C on in Tille Plants (E marks)	4B) g Living Roots (C4) ed Soils (C6) D1) (LRR A)	C3)	Water-S (MLRA Drainag Dry-Sea Saturat Geomo Shallow FAC-Ne Raised Frost-H	Stained L. 1, 2, 4A, ge Patterr ason Wat ion Visibl urphic Pos v Aquitaro eutral Tes Ant Mour leave Hur	(2 or mo eaves (E , and 4B ns (B10) ter Table le on Aer sition (D2 d (D3) st (D5) nds (D6) mmocks	ore requi 39) (i) e (C2) rial Imag 2) (LRR /	gery (C9)	
Primary Indication Primary Indication Surface High W Saturation Primary Indication Surface High W Saturation Iron De Inundation Surface Inundation Surface Water Vater Table Properticules capility	rology Indicator ators (minimum of Water (A1) ater Table (A2) ion (A3) Marks (B1) ant Deposits (B3) at or Crust (B4) posits (B5) e Soil Cracks (B6 ion Visible on Ae by Vegetated Cor ations: r Present? esent? elsent?	rs: If one re Perial Imancave S Yes Yes Yes Yes Yes Yes Yes Ye	equired; agery (B Gurface (check a (77) (88) No No No		Water-Stained Leave (except MLRA 1, 2, Salt Crust (B11) Aquatic Invertebrates Hydrogen Sulfide Octo Oxidized Rhizospher Presence of Reducer Recent Iron Reduction Stunted or Stresses Other (Explain in Ref Depth (inches): Depth (inches):	4A, and s (B13) dor (C1) res along d Iron (C on in Tille Plants (E marks)	4B) g Living Roots (C4) ed Soils (C6) D1) (LRR A)	C3)	Water-S (MLRA Drainag Dry-Sea Saturat Geomo Shallow FAC-Ne Raised Frost-H	Stained L. 1, 2, 4A, ge Patterr ason Wat ion Visibl urphic Pos v Aquitaro eutral Tes Ant Mour leave Hur	(2 or mo eaves (E , and 4B ns (B10) ter Table le on Aer sition (D2 d (D3) st (D5) nds (D6) mmocks	ore requi 39) (i) e (C2) rial Imag 2) (LRR /	gery (C9)	

Project/Site: West Seattle Extension		C	City/County: Seattle/King Sampling Date: 2/10/2								
Applicant/Owner: Sound Transit				Stat	tate: WA Sampling Point: WSE11-SP1						
Investigator(s): B. O'Neill, T. McIntyre			Section, Township, Range: S13, T24N, R3E								
Landform (hillslope, terrace, etc.): depressio	n	L	Local relief (concave, convex, none): concave Slope (%): 0								
Subregion (LRR): A	La	it: 47.56792									
Soil Map Unit Name: Alderwood-Everett-Urb						PEM1Cx					
Are climatic / hydrologic conditions on the si			_		lo (If no, explain in Re	emarks.)					
Are Vegetation , Soil , or Hydrolo		cantly distu	_	_	Normal Circumstances" pre	, , , , , , , , , , , , , , , , , , ,					
Are Vegetation, Soil, or Hydrolo	= -	ally problema			eded, explain any answers i						
SUMMARY OF FINDINGS – Attack	-	-				·					
Hydrophytic Vegetation Present?	Yes () No	i		<u> </u>						
- ·) No		e Sampled A in a Wetland		○ No					
, ,,	Yes () No			·· -						
Remarks:											
VEGETATION – Use scientific nar	mes of plants	s.									
	Absolu	ute Dom.	Relative	Indicator	Dominance Test worksh	heet:					
Tree Stratum (Plot size: 30ft x 30ft)	% Cov			Status	Number of Dominant Spe	ecies					
1. None				#N/A	That Are OBL, FACW, or	FAC: 2 (A)					
2. 3.				·	Total Number of Dominar Species Across All Strata						
4.				·	Percent of Dominant Spe						
		= Tota	al Cover		That Are OBL, FACW, or						
Sapling/Shrub Stratum (Plot size: 15ft x 15	ift)										
Solanum dulcamara	30	<u>Y</u>	100.0	FAC	Prevalence Index works	sheet:					
2.					Total % Cover of:	Multiply by:					
3.					OBL species 0	x 1 = 0					
4 5.		— —		· ——	FACW species 20 FAC species 110	x = 2 = 40 x = 330					
5.	30	= Tota	al Cover	·	FACU species 0	x 4 =0					
Herb Stratum (Plot size: 5ft x 5ft)			1 0010.		UPL species 30	x = 5 = 150					
1. Convolvulus arvensis	30	Y	23.1	UPL	Column Totals: 160	(A) 520 (B)					
2. Solanum dulcamara	70	Υ	53.8	FAC	Prevalence Index =	- D/A - 3.250					
3. Impatiens capensis	20		15.4	FACW							
4. Rubus armeniacus	10	N	7.7	FAC	Hydrophytic Vegetation						
5.					1 - Rapid Test for Hyd						
6.					2 - Dominance Test is 3 - Prevalence Index						
7. 8.		— —				aptations¹ (Provide supporting					
0			-	. ——		or on a separate sheet)					
10.				·	5 - Wetland Non-Vas	,					
11.				'		ytic Vegetation¹ (Explain)					
	130) = Tota	al Cover	'		and wetland hydrology must be					
Woody Vine Stratum (Plot size: 5ft x 5ft)				present, unless disturbed	or problematic.					
1. 2.	———			. ——	Hydrophytic						
2.		= Tota	al Cover	. ——	Vegetation	↑					
% Bare Ground in Herb Stratum 15					Present?	Yes					
Remarks:											
In herb stratum, a thin herbacious plant wa				ause only th	e stalks of last year's growt	h remained. It is assumed that					
wetland criteria are met due to the presenc	e of hydric soil a	ind wetland	l hydrology.								

SOIL Sampling Point: WSE11-SP1

	cription: (De	escribe t	o the depth	needed t				or confi	rm the absence of ir	ndicators.)		
Depth			0 1 /		ox Featur			+ .	Tarabasa			
(inches)	Color (n		%	Color (n	noist)	<u>%</u>	Type ¹	Loc²	Texture		Remarks	
0-5	10YR	4/3	100						Loam			
5-14	10YR	4/2	98	10YR	4/6	2	С	PL	Gravelly Loam			
14-15+	10YR	4/1	100						Loamy Sand			
										-		
17			tion DM F	D = -1 - 1 - 1 - 1 - 1 - 1 - 1			0 1 -	-1.01.6	21	-ti DI D	na Linia a N	NA - 4-i
¹Type: C=Co								a Sana C		ation: PL=Po		
Histosol		(дррпса	Die to all L		Redox (S		.,			Muck (A10)	matic riyar	ic cons .
_	oipedon (A2)			=	d Matrix					Parent Materia	l (TF2)	
Black His						. ,) (except	MLRA 1)		Shallow Dark	` ,	12)
Hydroge	n Sulfide (A	1)			•	1atrix (F2))		Other	(Explain in R	emarks)	
	d Below Dark		(A11)		d Matrix	` '						
_	ark Surface (lucky Minera					face (F6) Surface (F	71			s of hydrophy		
ı = ·	leyed Matrix	. ,		_	Depression		/)			nydrology mus sturbed or pro		ıı,
	Layer (if pre											
Type:	Layer (II pro	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,										
Depth (ir	nches).								Hydric Soil Pr	osant?	Yes	○ No
Remarks:									Tiyano con Ti			
itemarks.												
HYDROLO)GY											
Wetland Hy	drology Ind	icators:										
Primary Indi	cators (mini	num of o	ne required	l; check all	that appl	y)			Secondar	y Indicators (2 or more r	equired)
✓ Surface	Water (A1)		-	Wa	iter-Stain	ed Leave	s (B9) (ex	cept	Water	r-Stained Leav	/es (B9) (M	RA 1, 2,
1 = -	ter Table (A	2)				, 2, 4A, aı	nd 4B)			A, and 4B)		
Saturation					t Crust (I	-	(040)		=	age Patterns (. ,	
. =	arks (B1)	221				ertebrates			= :	eason Water '		(CO)
	t Deposits (E posits (B3)	52)			_	ulfide Od	or (CI) es along L	ivina Roc		ation Visible o Iorphic Positio		agery (C9)
_	t or Crust (B	4)					Iron (C4)			ow Aquitard ([
1 = -	osits (B5)	.,					n in Tilled			Neutral Test ([
:	Soil Cracks (B6)		=			Plants (D1	-		d Ant Mounds	(D6) (LRR	A)
	on Visible on				ner (Expl	ain in Rer	marks)		Frost-	Heave Humm	ocks (D7)	
<u>✓</u> Sparsely	Vegetated C	Concave S	Surface (B8))								
Field Obser	rvations:											
Surface Wa	ter Present?	_	=		oth (inche	es):						
Water Table	Present?	Ye			oth (inche	es):	3"					_
Saturation F		、 ① Ye	s O	lo Dep	oth (inche	es):	0"	^	etland Hydrology P	resent?	Yes	○ No
	pillary fringe		dalide mo	nitoring we	l aerial r	nhotos pr	evious in	spections	s), if available:			
Describe 140	ooraca Bate	r (ou cam	gaage, me	intolling wo	i, acriai p	жотогоо, рг	CVICUS III	Speciforic	o), ii avaliabio.			
Remarks:				_								
Extensive po	onding obse	ved on M	iarch 6, 202	23.								
Ī												

Project/Site: West Seattle Extension		City/Cour	nty: Seattle/King	g Sai	mpling Date: 2/10/2023
Applicant/Owner: Sound Transit			Sta	ite: WA Sai	mpling Point: WSE11-SP2
Investigator(s): B. O'Neill, T. McIntyre		Section, ⁻	 Township, Rang	je: S13, T24N, R3E	
Landform (hillslope, terrace, etc.): mound		Local reli	ef (concave, cor	nvex, none): none	Slope (%): 0
Subregion (LRR): A	Lat:		Long:		Datum: NAD83HARN
Soil Map Unit Name: Alderwood-Everett-Urban	land complex, 12 to	35 percent s		NWI Classification	on: PFO
Are climatic / hydrologic conditions on the site t	•		Yes 0	No (If no, explain i	in Remarks.)
Are Vegetation , Soil , or Hydrology		_	-	Normal Circumstances"	
Are Vegetation , Soil , or Hydrology				eded, explain any answ	
SUMMARY OF FINDINGS – Attach s	_		•		,
Hydrophytic Vegetation Present?		. g oap	ng pomition		
Hydric Soil Present?	=		s the Sampled		
Wetland Hydrology Present? Ye		W	ithin a Wetlan	d?	Yes No
Remarks:					
VEGETATION – Use scientific name	e of plants				
VEGETATION GGC SCIENTING Hamile	•			Dominance Test wo	nrkshaat:
<u>Tree Stratum</u> (Plot size: 30ft x 30ft)		om. Relati Sp.? % Cov			
Pseudostuga menziesii	75	Y 78.9		Number of Dominant That Are OBL, FACV	•
2. Alnus rubra	20	Y 21.	1 FAC	Total Number of Don	```
3.				Species Across All S	
4				Percent of Dominant	•
	95 = -	Total Cover		That Are OBL, FACV	V, or FAC: <u>80.0%</u> (A/B)
Sapling/Shrub Stratum (Plot size: 15ft x 15ft	_)	V 400	0	Prevalence Index w	orkshoot:
Rubus armeniacus 2.		Y 100.	0 FAC	Total % Cover of	
3.				OBL species	$\frac{1}{0} \frac{\text{wattipfy by.}}{\text{x 1} = 0}$
4.				FACW species	3 x 2 = 6
5.				FAC species	60 x 3 = 180
	20 =	Total Cover		FACU species	75 x 4 = 300
Herb Stratum (Plot size: 5ft x 5ft)				UPL species	0 x 5 = 0
Ranunculus repens Poa sp.	<u>10</u>	Y 41.7 N 4.2		Column Totals:	138 (A) <u>486</u> (B)
3. Phalaris arundinacea		N 8.3		Prevalence Ind	lex = B/A = 3.522
Equisetum telmateia		N 4.2		Hydrophytic Vegeta	tion Indicators:
5. Solanum dulcamara	10	Y 41.7		1 - Rapid Test for	r Hydrophytic Vegetation
6.				✓ 2 - Dominance To	est is >50%
7				3 - Prevalence In	
8.					I Adaptations¹ (Provide supporting rks or on a separate sheet)
9. 10.				5 - Wetland Non-	
10. 11.					rophytic Vegetation¹ (Explain)
-	24 =	Total Cover			soil and wetland hydrology must be
Woody Vine Stratum (Plot size: 5ft x 5ft)			present, unless distu	
1. None			#N/A		
2				Hydrophytic	
W Para Craund in Harb Stratus	=	Total Cover		Vegetation Present?	Yes
% Bare Ground in Herb Stratum75 Remarks:				1.555	
nemans.					

SOIL Sampling Point: WSE11-SP2

	ription: (D		o the depti				confirm	the absence of in	dicators.)		
Depth	0-1	Matrix	0/		dox Feature		2	T 4		D	
(inches)	Color (r		%	Color (moist)	%	Type ¹ Le	OC ²	Texture		Remarks	
0-19	10YR	3/2	100				<u>L</u>	oam			
·											
¹Type: C=Co	ncentration	D=Deple	etion, RM=F	Reduced Matrix, C	S=Covered	or Coated S	and Grai	ns. ²Loca	ation: PL=F	ore Lining, M	=Matrix.
		•		RRs, unless other			_			ematic Hydr	
Histosol ((A1)			Sandy Redox (S5)			☐ 2 cm I	Muck (A10)		
	ipedon (A2)			Stripped Matri				=	arent Mate		
Black His	,			Loamy Mucky	. ,) (except MLI	RA 1)			k Surface (TF	12)
Hydroger	n Sulfide (A	4)		Loamy Gleyed	Matrix (F2)			Other	(Explain in	Remarks)	-
Depleted	Below Dark	Surface	(A11)	Depleted Matr	x (F3)						
=	rk Surface (,		Redox Dark Su				³Indicators	s of hydrop	hytic vegetati	on and
	ucky Minera	. ,		Depleted Dark	•	7)				ust be preser	ıt,
Sandy Gl	eyed Matrix	(S4)		Redox Depress	sions (F8)			unless dis	turbed or p	roblematic.	
Restrictive I	Layer (if pro	esent):									
Type:										_	_
Depth (in	ches):							Hydric Soil Pre	sent?	O Yes	No
Remarks:											
HYDROLO	GY										
Wetland Hyd		licatora									
	•				.1.3			6	T I'	(2	
		mum or o	ne required	l; check all that ap		(DO) (aveau				(2 or more r	
	Vater (A1)	2)				(B9) (excep	Σ			aves (B9) (M	LKA 1, 2,
	er Table (A	2)			1, 2, 4A, ar	iu 40)			, and 4B)	- (P10)	
Saturation Water Ma				Salt Crust	vertebrates	(R13)			ge Pattern	r Table (C2)	
	: Deposits (I	321		= '	Sulfide Odd			= :		on Aerial Im	agery (C9)
	osits (B3)	52)				s along Living	a Roots (orphic Posit		agery (C3)
	or Crust (B	4)		=	of Reduced		g Roots (w Aquitard		
Iron Depo		'')		=		n in Tilled So	ils (C6)	=	eutral Test		
	Soil Cracks (B6)				Plants (D1) (L				ds (D6) (LRR	A)
	on Visible or	-	nagery (B7)	=	olain in Ren	. , .	,			mocks (D7)	,
_	Vegetated (•				, ,	
Field Observ	vations:										
Surface Water		○ Ye	s 📵 1	No Denth (inc	nes):						
Water Table		○ Ye	=								
Saturation P		○ Ye						and Hydrology Pr	ocont?	○ Yes	No
(includes cap			3 🐷 1	o Deptii (iiic			Weti	and riyurology Fi	esent:	<u> </u>	© 110
			gauge, mo	nitoring well, aeria	l photos, pr	evious inspe	ctions), i	f available:			
							•				
Remarks:											

Project/Site: West Seattle Extension			Ci	ity/County:	Seattle/King		Sampling	Date: <u>3/</u>	/6/2023	
Applicant/Owner: Sound Transit					Staf	te: WA	Sampling	Point: <u>W</u>	/SE12-SF	21
Investigator(s): B. O'Neill, T. McIntyre			Se	ection, Tow	nship, Rang	e: S13, T24N, R3I	E			
Landform (hillslope, terrace, etc.): terrac			Lc	ocal relief (c	concave, con	vex, none): conc	ave	Slo	pe (%):	
Subregion (LRR): A		Lat: 47	7.567894	44	Long: -	122.3663052	Dat	um: NAI	D83HARN	1
Soil Map Unit Name: Alderwood-Everett										
Are climatic / hydrologic conditions on the							lain in Rem			
Are Vegetation , Soil , or Hyd		significant	-	-	_	Normal Circumstan		·	Yes (○ No
Are Vegetation, Soil, or Hyd		naturally p	-			eded, explain any a	•			O 1.2
SUMMARY OF FINDINGS – Att					•				•	etc
					point loca	ations, transec	is, impo	- Tant i		, etc.
Hydrophytic Vegetation Present? Hydric Soil Present?	YesYes	O No		Is the	e Sampled A	Area	_	_		
Wetland Hydrology Present?	Yes	O No		withi	in a Wetland	1?	Yes	C) No	
Remarks:										
·										
VEGETATION – Use scientific	names of	plants.								
		Absolute	Dom.	Relative	Indicator	Dominance Tes	t workshee	ıt:		
Tree Stratum (Plot size: 30ft x 30ft 1.	_)	% Cover	Sp.?	% Cover	Status	Number of Domi			4	(A)
						Total Number of		····		(A)
3.						Species Across			4	(B)
4.						Percent of Domir		- :S		
			= Total	Cover		That Are OBL, F	•		100.0%	(A/B)
Sapling/Shrub Stratum (Plot size: 15ft	x 15ft)									
1. Cornus sericea		5	<u>Y</u>	100.0	FACW	Prevalence Inde				
2.						Total % Cov		-	tiply by:	_
3.						OBL species	5	x 1 = _	5	_
4 5.						FACW species FAC species	<u>10</u> 5	x 2 = _ x 3 =	20 15	-
J		5	= Total	Cover		FACU species	0	x 4 =	0	-
Herb Stratum (Plot size: 5ft x 5ft)			00.0.		UPL species	0	x 5 =	0	-
1. Scirpus microcarpus	- ′	5	Υ	31.3	OBL	Column Totals:	20	(A)	40	(B)
2. Phalaris arundinacea		5	Υ	31.3	FACW	Prevalence	Indox = R/	^ -	2.000	_
3. Ranunculus repens		5	Υ	31.3	FAC					_
4. <i>Poa sp.</i>		1	<u>N</u>	6.3	#N/A	Hydrophytic Ve	-			
5						1 - Rapid Tes	-		egetation	
6.						2 - Dominano				
7. 8.						4 - Morpholo			Drovide si	unnorting
0							emarks or o			
10.						5 - Wetland I				,
11.						Problematic				olain)
		16	= Total	Cover		¹Indicators of hyd		_		•
Woody Vine Stratum (Plot size: 5ft x 5	5ft)		,			present, unless o				,
1										
2						Hydrophytic				
0/ 0 0 1: 11 1 0: 1	.=		= Total	Cover		Vegetation Present?	ledot	Yes	○ No	
	<u>85</u>					riesent:				
Remarks:										

SOIL Sampling Point: WSE12-SP1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)												
Depth		Matrix			Red	ox Feature	es					
(inches)	Color (m	noist)	%	Color (n	noist)	%	Type ¹	Loc²		Texture	Remarks	3
0-8	10YR	3/2	100						Loai	m		
8-17	10YR	3/2	45	7.5YR	3/4	10	С	PL&M	Loai	my Sand		
8-17	10YR	4/1	45									
												
										_		
¹Type: C=Co	ncentration	D=Denle	tion RM=F	Reduced M	atrix CS:	=Covered	or Coate	ed Sand (Grains	²l ocation:	: PL=Pore Lining, N	/=Matrix
Hydric Soil								od Odila (Oranio.		Problematic Hyd	
Histosol		(1-1			Redox (S		,			2 cm Muck	_	
_	ipedon (A2)			= '	d Matrix	,					: Material (TF2)	
Black His						ineral (F1) (except	MLRA 1))		w Dark Surface (T	F12)
_	n Sulfide (A4	ł)		=		latrix (F2)		ĺ			lain in Remarks)	,
	l Below Dark		(A11)	= :	d Matrix	` '						
	rk Surface (_	Dark Surf						ydrophytic vegetat	
	ucky Mineral	. ,				Surface (F	7)				ogy must be prese	nt,
	leyed Matrix			Redox	Depressio	ons (F8)				unless disturbe	ed or problematic.	
Restrictive	Layer (if pre	esent):										
Type:												
Depth (in	iches):									Hydric Soil Present	? • Yes	○ No
Remarks:									<u> </u>			
HYDROLO	GY											
Wetland Hy	drology Ind	icators:										
Primary Indi			ne required	l· check all	that annl	v)				Secondary Indi	icators (2 or more	required)
	Nater (A1)	nun or or	ic required			ed Leaves	s (B9) (e)	xcent			ned Leaves (B9) (M	
	ter Table (A2	2)				, 2, 4A, ar	. , .	Тобре		4A, and		, _,
✓ Saturatio	-	-,		Sal	t Crust (I		,				atterns (B10)	
Water Ma	` ,				•	ertebrates	(B13)			= -	Water Table (C2)	
Sedimen	t Deposits (E	32)		Hy	drogen S	ulfide Odd	or (C1)			Saturation	Visible on Aerial In	nagery (C9)
Drift Dep	osits (B3)			Ox	idized Rh	izosphere	s along L	iving Roo	ots (C3	3) 🔽 Geomorphi	c Position (D2)	
Algal Mat	t or Crust (B	4)		Pre	sence of	Reduced	Iron (C4)		Shallow Aq	uitard (D3)	
	osits (B5)			=		Reductio		-	-	✓ FAC-Neutra		
	Soil Cracks (E	•				Stressed F		1) (LRR A	١)	=	Mounds (D6) (LRR	. A)
	on Visible on				ner (Expl	ain in Ren	narks)			Frost-Heav	e Hummocks (D7)	
	Vegetated C	oncave S	urrace (B8)								
Field Obser	vations:	_	_									
Surface Wat	ter Present?	○ Yes	=		oth (inche	es):		<u> </u>				
Water Table	Present?	Yes	s Ol	lo Dep	oth (inche	es):	14					
Saturation P		Yes	1 O	lo Dep	oth (inche	es):	0	v	Vetlan	d Hydrology Preser	it? • Yes	○ No
(includes ca Describe Re				nitarina wa	Looriolr	shataa nr	aviaua in	onaction	a) if a	voilable		
Describe Re	corded Data	(stream)	gauge, mo	nitoring we	ı, aeriai p	priotos, pr	evious in	spections	s), II av	valiable.		
Remarks:												
Ground water	er daylighting	j immedia	itely adjace	ent to soil p	it							

Project/Site: West Seattle Extension		City/County: Seattle/King Sampling Date: 3/6/2023						
Applicant/Owner: Sound Transit		,	_	Stat	e: WA Sampling Po	int: WSE12-SP2		
Investigator(s): B. O'Neill, T. McIntyre		Se	ection, Towr	nship, Range	e: S13, T24N, R3E			
Landform (hillslope, terrace, etc.): terrace		 Lo	cal relief (c	oncave, con	vex, none): convex	Slope (%): 30		
Subregion (LRR): A	Lat: 47.	567708	33	Long: -	122.3662745 Datum	: NAD83HARN		
Soil Map Unit Name: Alderwood-Everett-Urban land of	complex, 12 t	o 35 pe	ercent slope	s	NWI Classification: PFO			
Are climatic / hydrologic conditions on the site typical	for this time	of year	? ① Ye	s ON	o (If no, explain in Remark	s.)		
Are Vegetation , Soil , or Hydrology	significantly	disturk /	ed?	Are "N	lormal Circumstances" present?	Yes		
Are Vegetation , Soil , or Hydrology	naturally pr	oblema	tic?	(If nee	eded, explain any answers in Rer	narks.)		
SUMMARY OF FINDINGS – Attach site n	nap show	ing sa	ampling _l	ooint loca	tions, transects, importa	ant features, etc.		
Hydrophytic Vegetation Present? Yes Hydric Soil Present? Yes Wetland Hydrology Present? Yes Remarks:	No No No			Sampled A		⊚ No		
VEGETATION – Use scientific names of	plants.				Davis - Table - Indian			
Troo Stratum (Plot size: 30ft v 30ft	Absolute % Cover	Dom.	Relative	Indicator	Dominance Test worksheet:			
Tree Stratum (Plot size: 30ft x 30ft) 1. Acer macrophyllum	50	Sp.? Y	% Cover 62.5	Status FACU	Number of Dominant Species That Are OBL, FACW, or FAC:	2 (A)		
2. Alnus rubra 3.	30	Y	37.5	FAC	Total Number of Dominant Species Across All Strata:	4 (B)		
4.					Percent of Dominant Species	、 ,		
	80	= Total	Cover		That Are OBL, FACW, or FAC:	50.0% (A/B)		
Sapling/Shrub Stratum (Plot size: 15ft x 15ft)				,	5			
1. Rubus armeniacus	50	Υ	100.0	FACW	Prevalence Index worksheet:			
2					Total % Cover of: OBL species 0 x	Multiply by: 1 = 0		
4.					· —	2 = 100		
5.						3 = 90		
	50	= Total	Cover		FACU species 80 x	4 = 320		
Herb Stratum (Plot size: 5ft x 5ft)						5 = 0		
1					Column Totals: 160 (A) <u>510</u> (B)		
2					Prevalence Index = B/A =	3.188		
					Hydrophytic Vegetation Indic	ators:		
5.					1 - Rapid Test for Hydrophy			
6.					2 - Dominance Test is >509	%		
7					3 - Prevalence Index is ≤3.0			
8. 9.					4 - Morphological Adaptation data in Remarks or on a			
10					5 - Wetland Non-Vascular			
11		T-4-1	<u></u>		Problematic Hydrophytic V			
Woody Vine Stratum (Plot size: 5ft x 5ft)		= Total		FACIL	¹ Indicators of hydric soil and we present, unless disturbed or pre			
1. Hedera helix 2.	30	Y	100.0	FACU	Hydrophytic			
% Bare Ground in Herb Stratum 100	30	= Total	Cover		Vegetation Yes	s No		
Remarks:				<u> </u>				

SOIL Sampling Point: WSE12-SP2

Profile Description: (Describe to the depth needed to document the indicator or condepth Matrix Redox Features							r confirn	onfirm the absence of indicators.)					
Depth (inches)	Color (r	Matrix noist)	<u></u> %	Color (moist)	%		Loc²	Tex	dure	Remark	S		
0-17	10YR	3/2	100					Loam					
<u> </u>							 -	Louin					
											_		
¹Type: C=Co	ncentration	, D=Deple	tion, RM=R	Reduced Matrix, CS	S=Covered	or Coated	Sand Gr	ains.	²Location: PL	=Pore Lining, I	M=Matrix.		
Hydric Soil I	ndicators:	(Applical	ble to all L	RRs, unless othe	rwise note	d.)			Indicators for Pro	blematic Hyd	ric Soils³:		
Histosol (Sandy Redox (2 cm Muck (A1	,			
=	pedon (A2)			Stripped Matrix	. ,				Red Parent Ma				
Black His	tic (A3) 1 Sulfide (A	4)	<u>[</u>	Loamy Mucky N			ILRA I)		Very Shallow D Other (Explain	•	F12)		
_ ′ ′	Below Dark	•	(A11)	Depleted Matrix	, ,					iii Keiliaiks)			
_ :	rk Surface (()	Redox Dark Su	` ,				³ Indicators of hydro	ophytic vegeta	tion and		
	ucky Minera	. ,		Depleted Dark	Surface (F	7)			wetland hydrology	must be prese			
Sandy Gl	eyed Matrix	(S4)		Redox Depress	ions (F8)				unless disturbed of	r problematic.			
Restrictive I	ayer (if pr	esent):											
Type:										O v	A N		
Depth (in	ches):							Hydi	ric Soil Present?	○ Yes	No		
Remarks:													
HYDROLO	GY												
Wetland Hyd	drology Inc	licators:											
Primary Indic	ators (mini	mum of or	ne required	; check all that app	oly)				Secondary Indicato	ors (2 or more	required)		
	Vater (A1)			Water-Stai		(B9) (exc	ept		Water-Stained				
	er Table (A	2)		MLRA :	l, 2, 4A, ar	nd 4B)			4A, and 4B)				
Saturation	` '			Salt Crust					Drainage Patter				
Water Ma		na\		Aquatic In					Dry-Season Wa				
Drift Dep	Deposits (I	32)		Hydrogen : Oxidized R			ina Roots	s (C3)	Saturation Visib		nagery (C9)		
=	or Crust (E	34)		Presence of		_	mg Rook	3 (63)	Shallow Aquita				
Iron Depo		,		Recent Iro	n Reductio	n in Tilled 9	Soils (C6))	FAC-Neutral Te				
	oil Cracks (Stunted or		. ,	(LRR A)		Raised Ant Mou		R A)		
			nagery (B7)		lain in Ren	narks)			Frost-Heave Hu	ımmocks (D7)			
		oncave S	urface (B8)										
Field Observ													
Surface Water			_				_						
Water Table		O Yes					_ ı	.41 11.	udurala aux Dura a aut?	○ Voc	(a) No		
Saturation Proceeds (includes cap		Yes	s	lo Depth (inch	ies):		_ we	tiana Hy	drology Present?	○ Yes	No		
			gauge, mor	nitoring well, aerial	photos, pr	evious insp	ections),	, if availal	ble:				
Remarks:													
ixemaiks.													

Project/Site: West Seattle Extension	Cit	y/County: Seattle/King	Sampling Da	ate: 2/10/2023
Applicant/Owner: Sound Transit		Sta	te: WA Sampling Po	pint: WSE13-SP1
Investigator(s): B. O'Neill, T. McIntyre	Se	ction, Township, Rang	e: S13, T24N, R3E	
Landform (hillslope, terrace, etc.): terrace	Lo	cal relief (concave, cor	nvex, none): none	Slope (%): 2
Subregion (LRR): A	Lat: 47.568051	Long: -	-122.366266 Datum	n: NAD83HARN
Soil Map Unit Name: Alderwood-Everett-Urban land	complex. 12 to 35 pe		NWI Classification: PFO	
Are climatic / hydrologic conditions on the site typical				ks.)
Are Vegetation , Soil , or Hydrology	significantly disturb		Normal Circumstances" present?	
Are Vegetation , Soil , or Hydrology	naturally problemat		eded, explain any answers in Re	
SUMMARY OF FINDINGS – Attach site		•		•
				unit routures, etc.
Hydrophytic Vegetation Present? Hydric Soil Present? Yes Yes Yes	○ No ○ No	Is the Sampled		
Wetland Hydrology Present? Yes	○ No	within a Wetland	d? • Yes	○ No
Remarks:				
VECETATION . He asigntific names of	f wlowto			
VEGETATION – Use scientific names o	r piants.		I Barriaga Tarkara da bark	
T 01 1 (D) 1 : 000 000)	Absolute Dom.	Relative Indicator	Dominance Test worksheet:	
<u>Tree Stratum</u> (Plot size: <u>30ft x 30ft</u>) 1. <i>Cornus sericea</i>	% Cover Sp.?	% Cover Status 100.0 FACW	Number of Dominant Species	· 4 (A)
2.		100.0 FACVV	That Are OBL, FACW, or FAC	: <u>4</u> (A)
3.	· — —		Total Number of Dominant Species Across All Strata:	4 (B)
4.			Percent of Dominant Species	
	2 = Total (Cover	That Are OBL, FACW, or FAC	: <u>100.0%</u> (A/B)
Sapling/Shrub Stratum (Plot size: 15ft x 15ft)				
1. Cornus sericea	35 Y	70.0 FACW	Prevalence Index worksheet	
2. Rubus armeniacus	15 Y	30.0 FAC	Total % Cover of:	Multiply by:
3.			· —	x 1 = <u>0</u>
4 5.	· —— —		· —	x 2 = <u>254</u> x 3 = 45
·	50 = Total (Cover		x 4 = 0
Herb Stratum (Plot size: 5ft x 5ft)				x 5 = 0
1. Phalaris arundinacea	90 Y	100.0 FACW	Column Totals: 142	(A) 299 (B)
2			Prevalence Index = B/A	= 2.106
3.				
4.			Hydrophytic Vegetation India	
56.	- 		1 - Rapid Test for Hydroph 2 - Dominance Test is >50	•
7			3 - Prevalence Index is ≤3.	
8.			4 - Morphological Adaptati	
9.			data in Remarks or on	a separate sheet)
10.			5 - Wetland Non-Vascular	Plants ¹
11			Problematic Hydrophytic V	∕egetation¹ (Explain)
	90 = Total (Cover	¹Indicators of hydric soil and w	
Woody Vine Stratum (Plot size: 5ft x 5ft)		#N1/A	present, unless disturbed or pr	oblematic.
1. None		#N/A	Hydrophytic	
2	= Total (Cover	Vegetation	
% Bare Ground in Herb Stratum			Present? Ye	es O No
Remarks:			l	

SOIL Sampling Point: WSE13-SP1

Profile Des	cription: (De	escribe to	the depth	needed to	o docum	ent the i	ndicator	or confir	m the absence of inc	dicators.)	
Depth		Matrix			Redo	x Featur	es				
(inches)	Color (n	noist)	%	Color (n	noist)	%	Type ¹	Loc²	Texture	Remarks	
0-13	10YR	3/2	100						Loam		
13-15+	10YR	3/2	98	7.5YR	3/4	2	С	M	Loam		
¹Type: C=Co								d Sand G		ation: PL=Pore Lining, M=Matrix	
Hydric Soil		(Applicab	le to all L				ed.)			s for Problematic Hydric Soils	3.
Histosol	. ,		ļ	_	Redox (S					Muck (A10)	
_	oipedon (A2)		ļ		d Matrix (. ,	\	MIDA 1		arent Material (TF2)	
Black His	suc (A3) en Sulfide (A4	4)	[[Mucky Mi Gleyed M) (except	MLKA 1)		Shallow Dark Surface (TF12) (Explain in Remarks)	
	d Below Dark	•	A11)		ed Matrix		,		_ Other	(Explain in Kemarks)	
	ark Surface (•			Dark Surf				³Indicators	s of hydrophytic vegetation and	
Sandy M	lucky Minera	l (S1)	[Deplete	ed Dark S	urface (F	7)			ydrology must be present,	
Sandy G	leyed Matrix	(S4)		Redox I	Depressio	ns (F8)			unless dis	turbed or problematic.	
Restrictive	Layer (if pre	esent):									
Type:											
Depth (ir	nches):								Hydric Soil Pre	sent? • Yes O No)
Remarks:									•		
										es below ground surface, and it	was
vegetation.	oserve soil c	olor due to	nigh wate	r table. Hy	dric soil c	onditions	are assu	med pres	sent due to presence o	of hydrology and hydrophytic	
vegetation.											
LIVEROLO	NCV										
HYDROLO											
Wetland Hy										- 1	
	cators (mini	mum of on	<u>e required</u>				c (PO) (c)	cont		Indicators (2 or more required)	-
_	Water (A1) ter Table (A2	2)		vva	MLRA 1,		s (B9) (ex	серс		-Stained Leaves (B9) (MLRA 1, 2 , and 4B)	-,
✓ Saturatio	-	۷)		Sal	t Crust (E		id ib)			ge Patterns (B10)	
	arks (B1)				uatic Inve	-	s (B13)			eason Water Table (C2)	
	t Deposits (E	32)		`	drogen Sı					tion Visible on Aerial Imagery (C	29)
Drift Dep	oosits (B3)			Ox	idized Rh	izosphere	es along L	iving Roo	ts (C3) Geomo	orphic Position (D2)	
	t or Crust (B	4)		=			Iron (C4)			w Aquitard (D3)	
	osits (B5)	DC)					n in Tilled		_	eutral Test (D5)	
	Soil Cracks (I on Visible on	-	2001/(B7)		inted or S ner (Expla		Plants (D1	.) (LKK A		Ant Mounds (D6) (LRR A) Heave Hummocks (D7)	
_	Vegetated C				ici (Lxpic	alli III Kei	ilai KS)		1105t-1	leave Hullimocks (D7)	
Field Obser			. ,								
	ter Present?	○ Yes	● N	lo Der	oth (inche	e).					
Water Table		Yes) N	•	oth (inche		3"				
Saturation F		Yes	○ N		oth (inche		0"	— I w	etland Hydrology Pr	esent?	0
(includes ca	pillary fringe)									
Describe Re	ecorded Data	a (stream g	auge, mor	nitoring wel	I, aerial p	hotos, pr	evious in	spections), if available:		
Remarks:											-

Project/Site: West Seattle Extension		City/County: Seattle/King Sampling Date: 3/6/2023						
Applicant/Owner: Sound Transit			_	State	e: WA Sampling Point: WSE13-SP2			
Investigator(s): B. O'Neill, T. McIntyre		Sect	ion, Towr	ship, Range	S13, T24N, R3E			
Landform (hillslope, terrace, etc.): terrace		— Loca	l relief (co	oncave, conv	/ex, none): convex Slope (%): 1			
Subregion (LRR): A	Lat: 47.50		,		22.3663014 Datum: NAD83HARN			
Soil Map Unit Name: Alderwood-Everett-Urban land o	_		ent slope		NWI Classification: PFO			
Are climatic / hydrologic conditions on the site typical	•	•	Ye		_			
Are Vegetation , Soil , or Hydrology	significantly of	-	_	-	ormal Circumstances" present? Yes No			
Are Vegetation , Soil , or Hydrology	naturally prob				ded, explain any answers in Remarks.)			
				•	tions, transects, important features, etc.			
		iy saii	T	Joint Ioca	tions, transects, important leatures, etc.			
Hydrophytic Vegetation Present? Hydric Soil Present? Yes Yes	O No No		Is the	Sampled A	rea			
Hydric Soil Present? Yes Wetland Hydrology Present? Yes	No			n a Wetland				
Remarks:	<u> </u>							
Nemarks.								
VEGETATION – Use scientific names of	plants.							
	Absolute D	om. F	Relative	Indicator	Dominance Test worksheet:			
Tree Stratum (Plot size: 30ft x 30ft)	% Cover S		6 Cover	Status	Number of Dominant Species			
1. None				#N/A	That Are OBL, FACW, or FAC: 2 (A)			
2					Total Number of Dominant			
3					Species Across All Strata: 2 (B)			
4					Percent of Dominant Species			
Cardina/Charle Charles (District 454 v 454	=	Total Co	over		That Are OBL, FACW, or FAC: 100.0% (A/B)			
Sapling/Shrub Stratum (Plot size: 15ft x 15ft) 1. Cornus sericea	30	Υ	42.9	FACW	Prevalence Index worksheet:			
2. Rubus armeniacus	40	<u>'</u> –	57.1	FAC	Total % Cover of: Multiply by:			
3.		<u> </u>	07.1		OBL species 0 x 1 = 0			
4.					FACW species 30 x 2 = 60			
5.					FAC species 40 x 3 = 120			
	70 =	Total Co	ver		FACU species 0 x 4 = 0			
Herb Stratum (Plot size: 5ft x 5ft)					UPL species 0 x 5 = 0			
1. None				#N/A	Column Totals: (A) (B)			
2					Prevalence Index = B/A = 2.571			
3				—— 	Hydrophytic Vegetation Indicators:			
					1 - Rapid Test for Hydrophytic Vegetation			
6.					2 - Dominance Test is >50%			
7.					3 - Prevalence Index is ≤3.0¹			
8.					4 - Morphological Adaptations¹ (Provide supporting			
9.					data in Remarks or on a separate sheet)			
10					5 - Wetland Non-Vascular Plants ¹			
11					Problematic Hydrophytic Vegetation¹ (Explain)			
	=	Total Co	over		¹Indicators of hydric soil and wetland hydrology must be			
Woody Vine Stratum (Plot size: 5ft x 5ft)					present, unless disturbed or problematic.			
1.					Hydrophytic			
2		Total Co	ver		Vegetation			
% Bare Ground in Herb Stratum 100		30			Present?			
Remarks:				<u>l</u>				

SOIL Sampling Point: WSE13-SP2

Profile Desc	ription: (De	escribe t	o the deptl				or confir	rm the ab	sence of indicator	s.)	
Depth		Matrix			dox Feature			_			
(inches)	Color (n		%	Color (moist)	%	Type ¹	Loc²	le	exture	Remark	<u> </u>
0-17	10YR	3/2	100		. ——			Loam			
								-			
								-			
1Type: C=Ce	noontration	D-Donle	ation DM-	Reduced Matrix, CS	C-Covered	or Coat	ad Sand C	roine	2l coation: D	-Doro Lining I	M-Motrix
				RRs, unless othe			eu Sanu C	Jiailis.	Indicators for Pr	_=Pore Lining, I oblematic Hvd	
Histosol ((Sandy Redox (,			2 cm Muck (A	_	
=	pedon (A2)			Stripped Matrix					Red Parent M		
Black His	tic (A3)			Loamy Mucky I	Mineral (F1) (except	t MLRA 1))	Very Shallow	Dark Surface (T	F12)
= ' -	n Sulfide (A	,		Loamy Gleyed)			Other (Explain	n in Remarks)	
	Below Dark		(A11)	Depleted Matri							
	rk Surface (ucky Minera			Redox Dark Su Depleted Dark		7)			³ Indicators of hyd wetland hydrolog		
	eyed Matrix	. ,		Redox Depress	•	, ,			unless disturbed		iiit,
Restrictive I	•	` '			(- /					<u> </u>	
Type:	, , ,	,									
Depth (in	ches):							Hyd	dric Soil Present?		No
Remarks:	· <u> </u>										
HYDROLO	GY										
Wetland Hyd	drology Ind	icators:									
		num of o	ne required	; check all that app					Secondary Indica		
	Vater (A1)			Water-Stai		. , .	xcept			Leaves (B9) (N	1LRA 1, 2,
= -	er Table (A	2)			l, 2, 4A, ar	nd 4B)			4A, and 4E	,	
Saturation Water Ma				Salt Crust Aquatic In		(B13)			Dry-Season W	ater Table (C2)	
	: Deposits (E	32)		Hydrogen					= :	ible on Aerial In	
Drift Dep		-,		Oxidized R			iving Roo	ots (C3)	Geomorphic P		
	or Crust (B	4)		Presence of	f Reduced	Iron (C4	+)		Shallow Aquit		
Iron Depo				Recent Iro			•	•	✓ FAC-Neutral T		
=	oil Cracks (,	()	Stunted or			1) (LRR A	.)	_	ounds (D6) (LRF	R A)
	on Visible on				olain in Ren	narks)			Frost-Heave F	lummocks (D7)	
	Vegetated C	Joi icave 3	burrace (bo	1							
Field Observ		○ v-	- 📵	l-	,						
Surface Wate			=		· -						
Water Table		O Ye					— I 🙀	lational U	vdvolomy Dvocomt?	○ Voc	No
Saturation Proceeds (includes cap			s 🔾 i	No Depth (inch	ies).		— "	retiand n	ydrology Present?		● NO
			gauge, mo	nitoring well, aerial	photos, pr	evious in	spections	s), if availa	able:		
Remarks:											
rtomanto.											

Project/Site: West Seattle Extension	City/County: Seattle/King Sampling Date: 2/10/2023					
Applicant/Owner: Sound Transit		St	ate: WA	Sampling Po	oint: WSE14-SP1	
Investigator(s): B. O'Neill, T. McIntyre	Section,	Township, Ran	ge: S13, T24N,	R3E	·	
Landform (hillslope, terrace, etc.): depression	Local re	lief (concave, co	onvex, none): co	oncave	Slope (%): 5	
Subregion (LRR): A Lat: 47.5	567520	Long:	-122.366998	Datun	n: NAD83HARN	
Soil Map Unit Name: Alderwood-Everett-Urban land complex, 12 to	to 35 percent	slopes	NWI Clas	ssification: None	'	
Are climatic / hydrologic conditions on the site typical for this time	of year?	Yes	No (If no,	explain in Remark	ks.)	
Are Vegetation, Soil, or Hydrology significantly	disturbed?	Are	"Normal Circums	stances" present?	Yes No	
Are Vegetation , Soil , or Hydrology naturally pro	oblematic?	(If n	eeded, explain a	ny answers in Re	marks.)	
SUMMARY OF FINDINGS – Attach site map showi	ing sampl	ing point lo	cations, trans	sects, import	ant features, etc.	
Hydrophytic Vegetation Present? Hydric Soil Present? Wetland Hydrology Present? Yes No Yes No No Remarks:		Is the Samplec within a Wetla		Yes	○ No	
Outfalls to Longfellow Creek.						
VEGETATION – Use scientific names of plants.						
Absolute [Dom. Rela	ative Indicator	Dominance 1	Test worksheet:		
Tree Stratum (Plot size: 30ft x 30ft) % Cover 80 1. Alnus rubra 80	Sp.? % Co	O.0 Status FAC	- 1	ominant Species L, FACW, or FAC	: 1 (A)	
2. 3.			- 1	er of Dominant oss All Strata:	1 (B)	
4	= Total Cover		=	ominant Species L, FACW, or FAC		
Sapling/Shrub Stratum (Plot size: 15ft x 15ft)					\	
1. None		#N/A	Prevalence I	Index worksheet	:	
2			. -	Cover of:	Multiply by:	
3			OBL species		x 1 = <u>0</u> x 2 = 0	
5.			FACW species		x 3 = 240	
	Total Cover		FACU specie		x 4 = 0	
Herb Stratum (Plot size: 5ft x 5ft)			UPL species	0	x 5 = 0	
1. None		#N/A	Column Tota	ıls: <u>80</u>	(A) <u>240</u> (B)	
2			Prevale	ence Index = B/A	= 3.000	
3			Hydrophytic	Vegetation Indi	cators:	
5.			•	Test for Hydroph		
6.			✓ 2 - Domir	nance Test is >50	%	
7			✓ 3 - Preva	alence Index is ≤3.	.0¹	
8					ons¹ (Provide supporting a separate sheet)	
9			-	and Non-Vascular		
10. 11.			. 		/egetation¹ (Explain)	
	= Total Cover	-	¹Indicators of		etland hydrology must be	
1. None		#N/A	present, unic		obicinatio.	
2.			Hydrophytic	;		
% Bare Ground in Herb Stratum 100	= Total Cover	. — — —	Vegetation Present?	• Ye	es O No	
Remarks:			1			

SOIL Sampling Point: WSE14-SP1

Profile Des	cription: (D	escribe t	o the dept	h needed to	o docum	nent the i	ndicator	or confi	rm the absence of	indicators.)		
Depth		Matrix				ox Featur			_			
(inches)	Color (%	Color (n	noist)	<u>%</u>	Type ¹	Loc²	Texture	_	Remarks	5
0-4	10YR	3/2	100						Loam			
4-12+	N	4/0	95	10YR	3/6	5	С	M	Grvly sandy loam	<u> </u>		
									1	-		
									-	-		
									-			
¹Type: C=Co								d Sand C			Pore Lining, N	
Hydric Soil	Indicators:	(Applica	ble to all L	.RRs, unles	ss other	wise note	ed.)		Indicat	ors for Prob	lematic Hydi	ric Soils³:
Histosol	(A1)			Sandy I	Redox (S	5)				m Muck (A10		
_	pipedon (A2))			d Matrix					l Parent Mate	` ,	
_	stic (A3)	43			-	•	.) (except	MLRA 1)	=	•	rk Surface (T	F12)
	en Sulfide (A d Below Dar	-	/A11\		Gleyed M ed Matrix	1atrix (F2))		Otr	er (Explain ir	i Remarks)	
	ark Surface ((AII)	= :		face (F6)			3Indica:	ore of hydror	ohytic vegetat	ion and
_	lucky Minera			_		Surface (F	7)				nust be prese	
. =	lleyed Matrix	. ,			Depression	•	.,			disturbed or		,,,
Restrictive	Laver (if pr	esent):										
Type:	,	,										
Depth (ir	nches):								Hydric Soil I	Present?	Yes	◯ No
Remarks:												
Difficult to d	ig, many gra	avels and	cobbles									
HYDROLO	OGY											
Wetland Hy	drology Ind	dicators:										
Primary Indi	icators (mini	mum of o	ne required	d; check all	that appl	ly)			Second	ary Indicator	s (2 or more	required)
Surface \	Water (A1)			Wa	iter-Stain	ed Leave	s (B9) (ex	cept	Wa	ter-Stained Lo	eaves (B9) (M	LRA 1, 2,
	ter Table (A	.2)				, 2, 4A, aı	nd 4B)			4A, and 4B)		
<u>✓</u> Saturatio	` '			_	t Crust (•			=	inage Patterr	. ,	
_	arks (B1)	D2)				ertebrates					er Table (C2)	(60)
_	it Deposits (posits (B3)	B2)			_	iulfide Od	or (CI) es along L	ivina Poo		uration visible morphic Pos	e on Aerial Im	lagery (C9)
`	t or Crust (E	34)		=			Iron (C4)	_		llow Aquitaro		
	osits (B5)	<i>3</i> 1)		=			on in Tilled	•		:-Neutral Tes	. ,	
I == :	Soil Cracks ((B6)					Plants (D1	•	· =		ids (D6) (LRR	A)
Inundati	on Visible o	n Aerial In	nagery (B7) 🔲 Otł	ner (Expl	ain in Rer	marks)		Fro	st-Heave Hur	nmocks (D7)	
Sparsely	Vegetated	Concave S	Surface (B8)								
Field Obser	rvations:											
Surface Wa	ter Present?	? O Ye	s 💿 I	No Dep	oth (inche	es):						
Water Table	Present?	Ye	s 🔘 I	No Dep	oth (inche	es):	5"					
Saturation F		Ye	s 🔘 I	No Dep	oth (inche	es):	3"	w	etland Hydrology	Present?	Yes	○ No
(includes ca					l assists	-14) if available.			
Describe Re	ecorded Dat	a (stream	gauge, mo	nitoring wei	ı, aeriai p	onotos, pr	revious in	spections	s), if available:			
Remarks:												
Standing wa	ater 1.5 feet	away										

Project/Site: West Seattle Extension		Cit	ty/County:	Seattle/King	Sampling Date: 2/10/2023					
Applicant/Owner: Sound Transit			State: WA Sampling Point: WSE14-S							
Investigator(s): B. O'Neill, T. McIntyre		Se	Section, Township, Range: S13, T24N, R3E							
Landform (hillslope, terrace, etc.): terrace				-	vex, none): none Slope (%): 0					
Subregion (LRR): A	Lat: 47	 7.567486	· }	Long: -	122.366987 Datum: NAD83HARN					
Soil Map Unit Name: Alderwood-Everett-Urban land of					NWI Classification: None					
Are climatic / hydrologic conditions on the site typical			_							
Are Vegetation , Soil , or Hydrology	significant	-	_	_	Normal Circumstances" present? Yes No					
	naturally p	-			, -					
	, ,			•	eded, explain any answers in Remarks.) ations, transects, important features, etc.					
			inping		ations, transects, important leatures, etc.					
Hydrophytic Vegetation Present? Yes Hydric Soil Present? Yes Yes	● No		Is the	Sampled A	Area					
Hydric Soil Present? Yes Wetland Hydrology Present? Yes	O No			n a Wetland						
Remarks:										
Nemans.										
VEGETATION – Use scientific names of	plants.									
	Absolute	Dom.	Relative	Indicator	Dominance Test worksheet:					
Tree Stratum (Plot size: 30ft x 30ft)	% Cover	Sp.?	% Cover	Status	Number of Dominant Species					
Acer macrophyllum	50	<u>Y</u>	50.0	FACU	That Are OBL, FACW, or FAC: 2 (A)					
2. Picea sitchensis	5	<u>N</u>	5.0	FAC	Total Number of Dominant					
3. Alnus rubra	40	<u>Y</u>	40.0	FAC	Species Across All Strata: 5 (B)					
4. <u>Thuja plicata</u>	5	N Total	5.0	FAC	Percent of Dominant Species					
Sapling/Shrub Stratum (Plot size: 15ft x 15ft)	100	= Total	Cover		That Are OBL, FACW, or FAC: 40.0% (A/B)					
1. Symphoricarpos albus	40	Υ	64.5	FACU	Prevalence Index worksheet:					
Oemleria cerasiformis	5	N	8.1	FACU	Total % Cover of: Multiply by:					
3. Rubus spectabilis	5	N	8.1	FAC	OBL species 0 x 1 = 0					
4. Rosa gymnocarpa	10	N	16.1	FACU	FACW species 0 x 2 = 0					
5. Rubus armeniacus	2	N	3.2	FAC	FAC species 62 x 3 = 186					
	62	= Total	Cover		FACU species111 x 4 =444					
Herb Stratum (Plot size: 5ft x 5ft)					UPL species0 x 5 =0					
1. Polystichum munitum		<u>N</u>	9.1	FACU	Column Totals:173 (A)630 (B)					
Ranunculus repens Tellima grandiflora	<u>5</u> 5	<u>Y</u>	45.5 45.5	FACU	Prevalence Index = B/A = 3.642					
		<u>'</u>	45.5	TACO	Hydrophytic Vegetation Indicators:					
5.					1 - Rapid Test for Hydrophytic Vegetation					
6.					2 - Dominance Test is >50%					
7.					3 - Prevalence Index is ≤3.0¹					
8.					4 - Morphological Adaptations¹ (Provide supporting					
9					data in Remarks or on a separate sheet)					
10					5 - Wetland Non-Vascular Plants¹					
11					Problematic Hydrophytic Vegetation¹ (Explain)					
March Mine Obstance (District Structure)	11	= Total	Cover		¹Indicators of hydric soil and wetland hydrology must be					
Woody Vine Stratum (Plot size: 5ft x 5ft) 1. None				#N/A	present, unless disturbed or problematic.					
2	· ·			#11//-	Hydrophytic					
2		= Total	Cover		Vegetation					
% Bare Ground in Herb Stratum90					Present? Yes No					
Remarks:										

SOIL Sampling Point: WSE14-SP2

Profile Desc	cription: (De	scribe t	o the dept	h needed				or confi	rm the absence	of indicators.)		
Depth		Matrix				ox Featur						
(inches)	Color (m		%	Color (ı	moist)	<u>%</u>	Type ¹	Loc²	Texture		Remarks	<u> </u>
0-7	10YR	3/2	100						Loam			_
7-12	10YR	4/2	90	5YR	4/4	10	C	M	Sandy Loam			
12-19+	10YR	3/2	100						Gravelly Loam			
¹Type: C=Co	ncontration	D-Donle	otion PM-	Poducod M	latrix CS	-Covered	or Coat	nd Sand (Proinc	2l ocation: DI =	Poro Lining A	1-Matrix
Hydric Soil								eu Sanu C		² Location: PL=F cators for Prob		
Histosol					Redox (S		,			cm Muck (A10)	-	
=	ipedon (A2)			= :	ed Matrix					led Parent Mate		
Black His	stic (A3)			Loamy	Mucky M	lineral (F1) (except	t MLRA 1)		ery Shallow Da	rk Surface (TI	=12)
	n Sulfide (A4	-		_		1atrix (F2))		□ c	Other (Explain in	Remarks)	
	Below Dark		(A11)		ed Matrix							
	rk Surface (A ucky Mineral	-		_	Dark Sur	Surface (FS)	7)			cators of hydrop and hydrology m		
= '	leyed Matrix	` '		=	Depressi	•	,,			ss disturbed or p		ιι,
Restrictive I	<u> </u>					. ,				<u> </u>		
Type:	,	,										
Depth (in	ches):								Hydric Soi	il Present?	Yes	○ No
Remarks:												
2nd layer ap	pears to hav	e relic h	dric featur	es. Margins	s of redox	concentr	ations ar	e very cri	sp			
HYDROLO												
Wetland Hy	drology Indi	icators:										
Primary India		num of c	ne required							ndary Indicators		
	Water (A1)			W		ned Leaves	. , .	xcept		/ater-Stained Le	eaves (B9) (M	LRA 1, 2,
High Wat	ter Table (A2	(1)		□ c-	MLKA 1 alt Crust (, 2, 4A, ar	iu 46)			4A, and 4B) rainage Pattern	c (R10)	
Water Ma						ertebrates	(B13)			ry-Season Wate		
	t Deposits (B	2)			•	Sulfide Odd	. ,			aturation Visible		agery (C9)
_	osits (B3)	,			_	nizosphere	. ,	iving Roc		eomorphic Posi		5 , (,
Algal Mat	t or Crust (B4	1)		Pr	esence of	Reduced	Iron (C4	·)		hallow Aquitard	(D3)	
	osits (B5)					Reductio		•	· =	AC-Neutral Test		
=	Soil Cracks (E	-	(57			Stressed F	-	1) (LRR A	• =	aised Ant Moun	. , .	A)
	on Visible on Vegetated C				ther (Expl	ain in Ren	narks)		F	rost-Heave Hum	nmocks (D7)	
Field Obser		oricave s	оппасе (Бо	,								
Surface Wat		○ Ye	s 💿	No Do	nth (inch	٠٠)،						
Water Table		O Ye	=		pth (inche	es): 						
Saturation P		O Ye			pth (inche			— I "	etland Hydrolog	ny Present?	○ Yes	No
(includes cap			3	10 DC	pur (mon			— I "	retiana myarolog	gy i resent:	<u> </u>	© 110
Describe Re	corded Data	(stream	gauge, mo	nitoring we	ell, aerial _l	photos, pr	evious in	spections	s), if available:			
Remarks:												

Project/Site: West Seattle Extension		City	y/County:	Seattle/King	Sampling Date: 2/10/2023	
Applicant/Owner: Sound Transit		<u></u>	_	Stat	e: WA Sampling Point: WSE15-SP1	
Investigator(s): B. O'Neill, T. McIntyre		Sec	ction, Towr	ship, Range	e: S13, T24N, R3E	
Landform (hillslope, terrace, etc.): terrace		Loc	cal relief (co	oncave, con	vex, none): none Slope (%): 0	
Subregion (LRR): A	Lat: 47.	 567271		Long: -	122.366799 Datum: NAD83HARN	
Soil Map Unit Name: Alderwood-Everett-Urban land co	mplex, 12 to	o 35 pei	rcent slope		NWI Classification: Riverine	
Are climatic / hydrologic conditions on the site typical f			_	_	(If no, explain in Remarks.)	_
	significantly	•	_	_	Iormal Circumstances" present? Yes No	
	naturally pro				eded, explain any answers in Remarks.)	
SUMMARY OF FINDINGS – Attach site m				•		
Hydrophytic Vegetation Present? Yes	○ No	9		Sampled A		
Hydric Soil Present? Wetland Hydrology Present? Yes Yes	○ No			า a Wetland		
Wetland Hydrology Present? Yes Remarks:	<u> </u>					
VEGETATION – Use scientific names of p	olants.					
	Absolute	Dom.	Relative	Indicator	Dominance Test worksheet:	
<u>Tree Stratum</u> (Plot size: <u>30ft x 30ft</u>) 1. <i>None</i>	% Cover	Sp.?	% Cover	Status #N/A	Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)	
2. 3.					Total Number of Dominant Species Across All Strata: 3 (B)	
4.					Percent of Dominant Species	
	=	Total C	Cover		That Are OBL, FACW, or FAC: 66.7% (A/B)	
Sapling/Shrub Stratum (Plot size: 15ft x 15ft)				40.170	Prevalence Index worksheet:	
1. <u>None</u> 2.				#N/A	Total % Cover of: Multiply by:	
2. 3.					OBL species 0 x 1 = 0	
4.					FACW species 8 x 2 = 16	
5.					FAC species 10 x 3 = 30	
_	=	Total C	Cover		FACU species 1 x 4 = 4	
Herb Stratum (Plot size: 5ft x 5ft)					UPL species0 x 5 =0	
1. Ranunculus repens	10	<u>Y</u> .	37.0	FAC	Column Totals: (A) (B)	
2. Phalaris arundinacea 3. Poa sp.	<u>8</u> 8	Y Y	29.6	FACW #N/A	Prevalence Index = B/A = 2.632	
4. Lapsana communis	1 -	· N	3.7	FACU	Hydrophytic Vegetation Indicators:	
5.					1 - Rapid Test for Hydrophytic Vegetation	
6.					2 - Dominance Test is >50%	
7					3 - Prevalence Index is ≤3.0¹	
8.					 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet) 	3
9						
10 11.					5 - Wetland Non-Vascular Plants¹ Problematic Hydrophytic Vegetation¹ (Explain)	
	27 =	Total C	Cover		¹Indicators of hydric soil and wetland hydrology must b	20
Woody Vine Stratum (Plot size: 5ft x 5ft) 1. None				#N/A	present, unless disturbed or problematic.	ЭС
2.					Hydrophytic	
% Bare Ground in Herb Stratum 75		Total C	Cover		Vegetation Present? Yes No	
Remarks:						

SOIL Sampling Point: WSE15-SP1

Profile Desc	ription: (De	escribe t	o the dept	h needed t	to docum	ent the i	ndicator	or confi	rm the ab	sence of indicators.)		
Depth		Matrix				ox Featur						
(inches)	Color (n	noist)	%	Color (ı	moist)	<u>%</u>	Type ¹	Loc²		exture	Remarks	3
0-5	10YR	4/2	70	10YR	3/6	30	С	M	Loamy	Sand		
5-22	10YR	2/2	98	5YR	3/4	2	С	PL	Loamy	Sand		
									-			_
¹Type: C=Co								ed Sand (Grains.	² Location: PL=		
Hydric Soil I		(Applica	ble to all L				ed.)			Indicators for Prob	-	ric Soils³:
Histosol (= '	Redox (S	,				2 cm Muck (A10	,	
	ipedon (A2)				ed Matrix) (avaamb	MIDA 1		Red Parent Mate		E12)
Black His	n Sulfide (A4	1)				ineral (F1 1atrix (F2)		. MLKA 1,)	Very Shallow Da Other (Explain in	•	F12)
	Below Dark	•	(A11)		ed Matrix		,			Other (Explain ii	i itelliaiks)	
	rk Surface ((/ :==)		Dark Sur	. ,				³ Indicators of hydro	hytic vegetat	ion and
=	ucky Minera	-		_		Surface (F	7)			wetland hydrology n		
Sandy Gl	eyed Matrix	(S4)		Redox	Depression	ons (F8)				unless disturbed or	problematic.	
Restrictive L	Layer (if pre	esent):										
Type:												
Depth (inc	ches):								Hyd	dric Soil Present?	Yes	○ No
Remarks:									l.			
LIVEROLO	OV											
HYDROLO												
Wetland Hyd												
Primary Indic		mum of o	ne required				(20) (Secondary Indicator		
	Vater (A1)	2)		✓ W		ed Leave	. , .	xcept		Water-Stained L	eaves (B9) (M	ILRA 1, 2,
Saturation	er Table (A2	2)		□ c-	MLKA 1, alt Crust ()	, 2, 4A, aı	nu 46)			4A, and 4B) Urainage Patterr	oc (P10)	
✓ Water Ma					•	ertebrates	s (B13)			Dry-Season Wat	` '	
	: Deposits (E	32)			•	ulfide Od				Saturation Visible	` ,	nagery (C9)
Drift Dep		,		=	_	izosphere	. ,	iving Ro	ots (C3)	✓ Geomorphic Pos		-5-, (,
Algal Mat	or Crust (B	4)		Pr	esence of	Reduced	Iron (C4)		Shallow Aquitaro		
Iron Depo	. ,					Reductio		•	•	✓ FAC-Neutral Tes		
_	Soil Cracks (I	-				Stressed I	•	1) (LRR A	()	Raised Ant Mour		(A)
	on Visible on			-	her (Expl	ain in Rer	narks)			Frost-Heave Hur	nmocks (D7)	
	Vegetated C	LOI ICAVE S	ourrace (bo)								
Field Observ		O v		N. 5		,						
Surface Wate		¥			pth (inche	· —						
Water Table		O Ye			pth (inche	· -	4.411	— Ⅰ			♠ v	O.N.
Saturation Proceeds (includes cap		● Ye)	s () I	NO De	pth (inche	es):	14"	— I ' '	vetiana H	ydrology Present?	Yes	○ No
Describe Red			gauge, mo	nitoring we	ell, aerial p	ohotos, pr	evious in	spection	s), if availa	able:		
Domorko												
Remarks: Overbank flo	odina evide	nt										
O VOIDAIN NO	ouning ornao											

Project/Site: West Seattle Extension		Ci	ity/County:	Seattle/King	Sampling Date: 2/10/2023
Applicant/Owner: Sound Transit			•	Stat	te: WA Sampling Point: WSE15-SP2
Investigator(s): B. O'Neill, T. McIntyre		Se	ection, Tow	nship, Rang	e: S13, T24N, R3E
Landform (hillslope, terrace, etc.): hillslope		Lo	ocal relief (c	oncave, con	vex, none): none Slope (%): 15
Subregion (LRR): A	Lat: 47	7.567247	•		122.366917 Datum: NAD83HARN
Soil Map Unit Name: Alderwood-Everett-Urban land o					NWI Classification: PFO
Are climatic / hydrologic conditions on the site typical	-		_		
Are Vegetation , Soil , or Hydrology	significant	-	_	_	Normal Circumstances" present? Yes No
Are Vegetation , Soil , or Hydrology Are Vegetation , Soil , or Hydrology	naturally p	-			eded, explain any answers in Remarks.)
				•	
SUMMART OF FINDINGS - Attach site in			amping	point ioca	ations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes	● N		ls the	Sampled A	Area
Hydric Soil Present? Yes Wetland Hydrology Present? Yes	● N			n a Wetland	
Remarks:	<u> </u>	<u> </u>			
Remarks.					
VEGETATION – Use scientific names of	plants.				
	Absolute	Dom.	Relative	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30ft x 30ft)	% Cover	Sp.?	% Cover	Status	Number of Dominant Species
1. Picea sitchensis	25	<u>Y</u>	38.5	FAC	That Are OBL, FACW, or FAC: 3 (A)
2. Thuja plicata	30	<u>Y</u>	46.2	FAC	Total Number of Dominant
3. Prunus virginiana	10	N	15.4	FACU	Species Across All Strata: 6 (B)
4					Percent of Dominant Species
Sapling/Shrub Stratum (Plot size: 15ft x 15ft)	65	= Total	Cover		That Are OBL, FACW, or FAC: 50.0% (A/B)
1. Acer macrophyllum	2	N	6.3	FACU	Prevalence Index worksheet:
Symphoricarpos albus	20	Y	62.5	FACU	Total % Cover of: Multiply by:
3. Gaultheria shallon	10	Υ	31.3	FACU	OBL species 0 x 1 = 0
4.					FACW species 0 x 2 = 0
5					FAC species 65 x 3 = 195
	32	= Total	Cover		FACU species 48 x 4 = 192
Herb Stratum (Plot size: 5ft x 5ft)	_		0.4.0	E4011	UPL species $0 \times 5 = 0$
Polystichum munitum Ranunculus repens	<u>5</u>	<u>Y</u>	31.3 62.5	FACU FAC	Column Totals: 113 (A) 387 (B)
3. Taraxacum officinale	1	<u></u>	6.3	FACU	Prevalence Index = B/A = 3.425
4		<u> </u>		17.00	Hydrophytic Vegetation Indicators:
5.					1 - Rapid Test for Hydrophytic Vegetation
6.					2 - Dominance Test is >50%
7					3 - Prevalence Index is ≤3.0¹
8					4 - Morphological Adaptations¹ (Provide supporting
9.					data in Remarks or on a separate sheet)
10 11.					5 - Wetland Non-Vascular Plants¹ Problematic Hydrophytic Vegetation¹ (Explain)
II	16	= Total	Cover		
Woody Vine Stratum (Plot size: 5ft x 5ft)	10	- Total	Cover		¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1					F,
2.					Hydrophytic
		= Total	Cover		Vegetation Present? Yes No
% Bare Ground in Herb Stratum75					Present?
Remarks:					
					1

SOIL Sampling Point: WSE15-SP2

Profile Desc	ription: (De	escribe t	o the dept	h needed to docur			or confi	rm the at	sence of indicat	ors.)	
Depth		Matrix			ox Feature			_			
(inches)	Color (m		%	Color (moist)	<u>%</u>	Type ¹	Loc²	16	exture	Remark	S
0-16	10YR	3/2	100					Loam			
1Typo: C=Co	ncontration	D-Donk	ation PM-I	Reduced Matrix, CS	-Covered	or Coat	nd Sand C	Graine	2l ocation:	DI -Doro Lining	M-Matrix
				RRs, unless other			eu Sanu C	Jiailis.		PL=Pore Lining, Problematic Hyd	
Histosol		()		Sandy Redox (S		,			2 cm Muck	-	
=	ipedon (A2)			Stripped Matrix						Material (TF2)	
Black His	tic (A3)			Loamy Mucky N	lineral (F1) (except	t MLRA 1))	Very Shallo	w Dark Surface (1	TF12)
= ' '	n Sulfide (A4	,		Loamy Gleyed I		1			Other (Expl	ain in Remarks)	
	Below Dark		(A11)	Depleted Matrix							
	rk Surface (<i>i</i> ucky Mineral			Redox Dark Sur Depleted Dark		7)				ydrophytic vegeta ogy must be prese	
	eyed Matrix	. ,		Redox Depressi	•	, ,				d or problematic.	5111,
Restrictive I	•	• •			(- /					<u> </u>	
Type:	,	,									
Depth (in	ches):							Hyd	dric Soil Present	? Yes	No
Remarks:											
HYDROLO	GY										
Wetland Hyd	drology Ind	icators:									
	-	num of o	ne required	d; check all that app						cators (2 or more	
	Vater (A1)			Water-Stair		. , .	xcept			ed Leaves (B9) (I	MLRA 1, 2,
= -	er Table (A2	2)			, 2, 4A, ar	nd 4B)			4A, and	,	
Saturatio Water Ma				Salt Crust (Aquatic Inv		(B13)				atterns (B10) Water Table (C2)	1
	: Deposits (E	32)		Hydrogen S					=	/isible on Aerial I	
Drift Dep		-,		Oxidized R		. ,	_iving Roc	ots (C3)		Position (D2)	
	or Crust (B	4)		Presence o	f Reduced	Iron (C4	+)		Shallow Aqu		
Iron Dep				Recent Iro			-	-	FAC-Neutra		
=	Soil Cracks (F	-		Stunted or			1) (LRR A	()		Mounds (D6) (LR	,
=	on Visible on				lain in Ren	narks)			Frost-Heave	Hummocks (D7)	
	Vegetated C	oncave 3	burrace (bo)							
Field Obser		○ v _a	- 📵	No. Donath Coords	\						
Surface Wat		○ Ye	=								
Water Table		○ Ye					— I 🙀	lotlond H	ludrologu Drocon	12 O Voc	(A) No
Saturation Pi (includes cap		Ye	s () I	No Depth (inch	es):		— "	vetiana H	lydrology Presen	t? Yes	No
			gauge, mo	nitoring well, aerial	photos, pr	evious ir	spections	s), if avail	able:		
Remarks:											
Overbank flo	odina evide	nt									
•	g										

Project/Site: West Seattle Extension		Ci	ty/County:	Seattle/King	Sampling Date: 2/10/2023			
Applicant/Owner: Sound Transit			State: WA Sampling Point: WSE16-5					
Investigator(s): B. O'Neill, T. McIntyre		Se	ection, Tow	nship, Range	e: S13, T24N, R3E			
Landform (hillslope, terrace, etc.): floodplain				-	vex, none): none Slope (%): 5			
Subregion (LRR): A	Lat: 47	7.567095	-		122.366839 Datum: NAD83HARN			
Soil Map Unit Name: Alderwood-Everett-Urban land					NWI Classification: Riverine			
Are climatic / hydrologic conditions on the site typical	-							
Are Vegetation , Soil , or Hydrology	significant	-	_	_	Normal Circumstances" present? Yes No			
Are Vegetation , Soil , or Hydrology Are Vegetation , Soil , or Hydrology	naturally p	-			eded, explain any answers in Remarks.)			
	, ,							
SUMMART OF FINDINGS - Attach site i	nap snov	villy so	amping	point loca	ations, transects, important features, etc.			
Hydrophytic Vegetation Present? Yes	○ No		ls the	Sampled A	Area			
Hydric Soil Present? Wetland Hydrology Present? Yes Yes	O No			n a Wetland				
Remarks:	<u> </u>	J						
Remarks.								
VEGETATION – Use scientific names of	plants.							
	Absolute	Dom.	Relative	Indicator	Dominance Test worksheet:			
Tree Stratum (Plot size: 30ft x 30ft)	% Cover		% Cover	Status	Number of Dominant Species			
1. None				#N/A	That Are OBL, FACW, or FAC: 2 (A)			
2					Total Number of Dominant			
3.					Species Across All Strata: 5 (B)			
4					Percent of Dominant Species			
Cardinar/Charle Charters (Diet sins 45ft v 45ft		= Total	Cover		That Are OBL, FACW, or FAC: 40.0% (A/B)			
Sapling/Shrub Stratum (Plot size: 15ft x 15ft) 1. Symphoricarpos albus	5	Υ	29.4	FACU	Prevalence Index worksheet:			
2. Thuja plicata	1	<u>-</u>	5.9	FAC	Total % Cover of: Multiply by:			
3. Cornus sericea	10	<u>Y</u>	58.8	FACW	OBL species 15 x 1 = 15			
4. Salix sitchensis	1	N	5.9	FACW	FACW species 18 x 2 = 36			
5.					FAC species 1 x 3 = 3			
	17	= Total	Cover		FACU species 18 x 4 = 72			
Herb Stratum (Plot size: 5ft x 5ft)					UPL species0 x 5 =0			
1. Juncus effusus	2	<u>N</u>	5.7	FACW	Column Totals: (A) (B)			
Equisetum telmateia Tellima grandiflora			5.7	FACU FACU	Prevalence Index = B/A =2.423			
Oxalis oregana	3		8.6	FACU	Hydrophytic Vegetation Indicators:			
5. Phalaris arundinacea	3	N	8.6	FACW	1 - Rapid Test for Hydrophytic Vegetation			
6. Lapsana communis	5	<u>Y</u>	14.3	FACU	2 - Dominance Test is >50%			
7. Oenanthe sarmentosa	15	Y	42.9	OBL	3 - Prevalence Index is ≤3.0¹			
8.					4 - Morphological Adaptations¹ (Provide supporting			
9					data in Remarks or on a separate sheet)			
10					5 - Wetland Non-Vascular Plants¹			
11					Problematic Hydrophytic Vegetation¹ (Explain)			
Marsha Vina Otostona (District	35	= Total	Cover		¹Indicators of hydric soil and wetland hydrology must be			
Woody Vine Stratum (Plot size:) 1. None				#N/A	present, unless disturbed or problematic.			
2.				#11//	Hydrophytic			
		= Total	Cover		Vegetation			
% Bare Ground in Herb Stratum65		•			Present? Yes No			
Remarks:								
A beaver downed a medium-sized alder that would	have otherw	ise beer	n within the	wetland bou	ındary			

SOIL Sampling Point: WSE16-SP1

Profile Desc	ription: (De	escribe to	the depth	needed to docum	ent the inc	dicator	or confirm	n the ab	sence of indicators.)		
Depth		Matrix			ox Features						
(inches)	Color (n	noist)	%	Color (moist)	%	Type ¹	Loc²	Tex	xture	Remarks	
0-9	10YR	2/2	100					Loam			
9-18	10YR	3/1	100					Loamy S	Sand		
				Reduced Matrix, CS			d Sand Gr	rains.	² Location: PL=		
		(Applicable	le to all L	RRs, unless other		l.)			Indicators for Prob	•	ic Soils³:
Histosol (. ,		ļ	Sandy Redox (S	,				2 cm Muck (A10	,	
	ipedon (A2)		l	Stripped Matrix		/ av a a m b	MIDA 1)		Red Parent Mate		-12)
Black His	า Sulfide (A4	1)	 	Loamy Mucky M		(ехсері	MLKA 1)		✓ Very Shallow Da✓ Other (Explain in		-12)
_ ′ ′	Below Dark	•	\11)	Depleted Matrix	` ,				Other (Explain ii	i Kemarks)	
	rk Surface (•	,	Redox Dark Sur	` '				³ Indicators of hydro	hvtic vegetati	on and
_	ucky Minera		ĺ	Depleted Dark S)			wetland hydrology n	, ,	
Sandy Gl	eyed Matrix	(S4)		Redox Depression	ons (F8)				unless disturbed or	problematic.	
Restrictive L	Layer (if pre	esent):									
Type:											
Depth (inc	ches):							Hyd	ric Soil Present?	Yes	○ No
Remarks:								<u> </u>			
Hydric soil is	assumed d	ue to prese	ence of hy	drophytic vegetatio	n and wetla	nd hydro	ology.				
LIVEROLO	OV										
HYDROLO											
Wetland Hyd											
		num of one	e required	; check all that app		(=a) (Secondary Indicator		
	Vater (A1)			Water-Stair		. , .	cept		Water-Stained L	eaves (B9) (M	LRA 1, 2,
☐ High Wat	er Table (A2	<u>2)</u>		Salt Crust (, 2, 4A, and	146)			4A, and 4B) ✓ Drainage Patterr	oc (P10)	
Water Ma	• •			Aquatic Inv		(B13)			Dry-Season Wat	. ,	
	: Deposits (E	32)		Hydrogen S		` '			Saturation Visible	` ,	agery (C9)
	osits (B3)	,		Oxidized Rh			ving Roots	s (C3)	Geomorphic Pos		3 , ()
Algal Mat	or Crust (B	4)		Presence of	Reduced I	ron (C4)			Shallow Aquitaro	l (D3)	
Iron Depo				Recent Iron				-	FAC-Neutral Tes		
	Soil Cracks (I	,	(57)	Stunted or) (LRR A)		Raised Ant Mour		A)
	on Visible on		- , , ,		ain in Rema	arks)			Frost-Heave Hur	nmocks (D7)	
Sparsely	Vegetated C	oricave Su	nace (bo)				-				
Field Obser	vations:	<u> </u>	.	- D # # 1							
Field Observ	D 10		● N	• •	· —	13"					
Surface Wate		Yes	=	la Dandle (in ale.		1.5					
Surface Water Table	Present?	Yes	Ō١	. ,	· —		_ \	المسملاء	uduala mu Duaa amato	(A) Voc	O Na
Surface Wate Water Table Saturation Pr	Present? resent?	YesYes	=	• •	· —	9"	We	etland Hy	/drology Present?	Yes	○ No
Surface Wate Water Table Saturation Pr (includes cap	Present? resent? pillary fringe	Yes Yes Yes	Ō N	. ,	es):	9"				Yes	○ No
Surface Wate Water Table Saturation Pr (includes cap	Present? resent? pillary fringe	Yes Yes Yes	Ō N	lo Depth (inche	es):	9"				Yes	○ No
Surface Water Water Table Saturation Pr (includes cap Describe Red	Present? resent? pillary fringe	Yes Yes Yes	Ō N	lo Depth (inche	es):	9"				Yes	○ No
Surface Water Table Water Table Saturation Prediction (includes cape Describe Red Remarks:	Present? resent? billary fringe corded Data	Yes Yes (stream g	O Nauge, mor	lo Depth (inche	photos, prev	9" vious ins	spections)	, if availa		Yes	○ No
Surface Water Table Water Table Saturation Prediction (includes cape Describe Red Remarks:	Present? resent? billary fringe corded Data	Yes Yes (stream g	O Nauge, mor	lo Depth (inche	photos, prev	9" vious ins	spections)	, if availa		Yes	○ No
Surface Water Table Water Table Saturation Prediction (includes cape Describe Red Remarks:	Present? resent? billary fringe corded Data	Yes Yes (stream g	O Nauge, mor	lo Depth (inche	photos, prev	9" vious ins	spections)	, if availa		Yes	○ No
Surface Water Table Water Table Saturation Prediction (includes cape Describe Red Remarks:	Present? resent? billary fringe corded Data	Yes Yes (stream g	O Nauge, mor	lo Depth (inche	photos, prev	9" vious ins	spections)	, if availa		Yes	○ No