

11. Wetland & Habitat

Holley Park Subdivision La Center, Washington Critical Areas Assessment

Date: March 14, 2019

Applicant: Compass Group, LLC

Contact: Kevin Tapani 1904 SE 6th Place

Battle Ground, WA 98604

Prepared By: Stacey Reed, PWS, Senior Wetland Scientist

Taya K. MacLean, PWS, Senior Biologist

Site Information: Parcel No. 209059-000, 62965-242, 209055-

Section 02, T4N, R1E, W.M. 45.860301, -122.660134

La Center, Clark County, Washington



9600 NE 126th Avenue, Ste 2520 Vancouver, WA 98682 (360) 882-0419

Table of Contents

Introduction	3
Background Mapping and Site Information	3
Methodology	5
Results	
Water 1	6
Water 2	7
Water 3	7
Uplands	7
Priority Oregon White Oaks	8
Riparian Habitat Area	8
Riparian Buffer Enhancement Plan	9
Performance Standards	9
Buffer Enhancement Monitoring Plan	10
Buffer Enhancement Maintenance Plan	10
Statement of Preparation	10
Literature Cited and Referenced	11
Tables	
Table 1. Precipitation Data Prior to November 14, 2018 Site Visit Table 2. Precipitation Data Prior to March 11, 2019 Site Visit	
Appendices	

Appendix A. Figures

Figure 1. Vicinity Map (USGS)

Figure 2. Parcel Map

Figure 3. NRCS Soil Survey Map

Figure 4. USFWS National Wetlands Inventory (NWI) Map

Figure 5. Clark County Mapped Wetlands

Figure 6. Department of Natural Resources (WDNR) Water Map

Figure 7. Clark County Priority Habitat Map

Figure 8. WDFW Priority Habitat and Species (PHS) Map

Figure 9. Critical Areas Map

Figure 10. Site Plan

Appendix B: Wetland Determination Data Forms

Appendix C: Streamflow Duration Assessment Forms

Appendix D. Representative Site Photographs

Appendix E. Riparian Buffer Enhancement Planting Specifications

Introduction

AKS Engineering & Forestry, LLC (AKS) was contracted by Compass Group, LLC (Applicant) to conduct a critical areas assessment on a 14.52 acre site located at 33105 NE Ivy Avenue in La Center, Clark County, Washington (Figures 1 and 2 of Appendix A). The project includes a single-family residential subdivision, including stormwater, a public trail, and open space tracts.

AKS Engineering & Forestry, LLC (AKS) conducted a site visit on November 14, 2018 to determine whether any critical areas (i.e. potentially jurisdictional wetlands, waters, and/or priority habitats) were present in the study area. The on-site boundaries of three potentially jurisdictional non-fishbearing intermittent streams (referred to as Waters 1, 2, and 3; Type Ns streams) were delineated within the study area. According to the City of La Center's Municipal Code (LCMC) Critical Areas Ordinance (LCMC Table 18.300.090.2.f), Type Ns streams require a 75-foot wide fish and wildlife habitat conservation area (ie riparian) buffer.

Oregon white oak (*Quercus garryana*) individual priority trees that meet the Washington Department of Fish and Wildlife's (WDFW) definition of a priority habitat feature were also identified within the study area. These individual priority habitat trees are protected by the City (LCMC Table 18.300.090.2.a). AKS met with WDFW on-site on February 21, 2019 to verify the priority status of all oaks on the site.

The project avoids impacts to individual priority oaks and waters delineated on the site. The project also avoids encroachment within the 75-foot wide riparian buffers associated with Waters 2 and 3. The project requires a 50% buffer reduction, in accordance with LCMC 18.300.090 (2)(I), to a portion of the 75 foot wide buffer associated with Water 1 to accommodate an 8 foot wide gravel trail and a portion of rear lots. On-site enhancement of remaining "degraded condition" riparian buffer is proposed to ensure the reduced buffer will not have an adverse impact on the buffer's water quality and habitat functions.

This report addresses the City of La Center's Chapter 18.300 Critical Areas Code report and mitigation plan requirements. This study does not include an assessment of other critical areas defined under La Center's (City) Critical Areas Ordinance (CAO), including aquifer recharge areas, frequently flooded areas, or geologic hazard areas.

Background Mapping and Site Information

AKS reviewed existing literature, maps, and other materials to identify critical areas having the potential to occur on the subject property or within 300 feet. AKS reviewed the following background information databases:

- Clark County MapsOnline
- Historical aerial imagery from Clark County
- Natural Resources Conservation Service (NRCS) Web Soil Survey
- USFWS National Wetland Inventory (NWI)
- Washington Department of Ecology 2011 Wetlands Inventory
- WDFW Priority Habitats and Species
- Washington National Heritage Program (WNHP) Wetlands of High Conservation Value Map Viewer (Rare Plants and High-Quality Wetlands)
- DNR Water Typing
- DNR SalmonScape



The NRCS, NWI, Clark County wetlands, DNR waters, and priority habitat and species maps are provided as Figures 3, 4, 5, 6, and 7 in Appendix A.

The study area mainly consists of a grazed horse pasture, with non-grazed forested areas along the northern and southern boundaries of the site. The site includes a house and small detached farm structures. Vegetation observed within the pasture includes bentgrass (*Agrostis* sp.; FAC), meadow foxtail (*Alopecurus pratensis*; FAC), hairy cat's ear (*Hypochaeris radicata*; FACU), Queen Anne's lace (*Daucus carota*; FACU), bluegrass (*Poa* sp.; FAC), and Tyrol knapweed (*Centaurea nigrescens*; NOL). The forested area along the northern boundary is dominated by Douglas-fir (*Pseudotsuga menziesii*; FACU), big- leaf maple (*Acer macrophyllum*; FACU), and red alder (*Alnus rubra*; FAC) with scattered Oregon white oak (FACU) trees. Himalayan blackberry (*Rubus armeniacus*; FAC) was dominant in the forest understory.

Site topography gently slopes southwest with the highest elevation in the northeastern corner at 132 feet to the lowest elevation at 95 feet in the southwestern corner. The East Fork Lewis River is located approximately 0.5 mile to the south of the site.

According to the Natural Resources Conservation Service (NRCS) Soil Survey Map for Clark County (Figure 3), the following soils are mapped within the study area (Figure 3 in Appendix A):

- Gee silt loam (0% to 8% slopes, Unit GeB; non-hydric)
- Gee silt loam (30%-60% slopes, Unit GeF; non-hydric)
- Odne silt loam (0% to 5% slopes, Unit OdB; hydric)

According to the United States Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) online mapping, there are no wetlands or riverine features mapped on-site (Figure 4, Appendix A).

According to Clark County's online mapping, there are mapped modeled wetlands adjacent to Water 1 in the northwestern portion of the site. The County map does not show any other wetlands mapped on the site (Figure 5, Appendix A). There was no hydrophytic vegetation observed above the OHWM of Water 1.

According to the DNR online mapping tool, a Type N stream is mapped along the northern portion of the site. AKS identified this stream as Water 1, a Type Ns stream (Figure 6, Appendix A). Two "unknown" streams are mapped by DNR, including one immediately off-site to the east and one in the southeastern portion of the study area (Figure 6, Appendix A). AKS identified these features as Water 2 and 3, Type Ns streams.

Based on Clark County's online mapping, there is mapped riparian habitat in the vicinity of Water 1 (Figure 7, Appendix A). We generally agree with the riparian habitat mapping adjacent to Water 1. The County maps also illustrates a portion of the 200 foot riparian buffer associated with an off-site Type F stream extending onto the southeast portion of the study area. This stream is located greater than 200 feet from the project site; therefore, riparian habitat buffer associated with the off-site mapped stream does not appear to extend onto the site.

According to WDFW's PHS mapping, Oregon white oak woodland priority habitat is mapped within 300 feet of the study area, but priority oak habitat is not mapped on the project site (Figure 8 of Appendix A). No other priority habitat species are mapped on the site. According to DNR's SalmonScape mapping,

on-site waters do not support fish listed as threatened or endangered under the Endangered Species Act (ESA).

Based on a review of the Washington Natural Heritage Program (WNHP) mapping, there are no documented occurrences of rare plants or species of high conservation value listed as threatened or endangered under the ESA mapped on-site, nor were any observed by AKS during the November 2018 site visit.

Historical aerial photographs dating from 1955 to 2018 were reviewed from Google earth and Clark County Online Mapping. The site has remained relatively unchanged since the 1994 aerial. Per the property owner, the site has been actively grazed by cattle, sheep, and horse for decades. According to review of aerials, there are no consistent evidence of potential hydrology signatures on the site.

Methodology

Taya MacLean, Senior Biologist and Sonya Templeton, Natural Resource Specialist, conducted the critical areas assessment site visit on November 14, 2018. A follow up site visit was conducted by Stacey Reed, PWS, Senior Wetland Scientist on March 11, 2019 to confirm lack of wetland hydrology indicators during the early portion of the growing season.

The methodology used to determine the presence of wetlands followed the Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0) (Wakeley et al. 2010). The National Wetland Plant List 2016 (Lichvar 2016) was used to assign wetland indicator status for the appropriate region. Plots 1-4 were recorded on standardized data forms. Their locations were flagged in the field and were professionally land surveyed.

The OHWM were delineated using methodology described in ECY's *Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State* (2016).

Streamflow duration assessments Waters 1, 2 and 3 were determined using the US Environmental Protection Agency's *Streamflow Duration Assessment Method for the Pacific Northwest* (Nadeau, 2015; Appendix B). Water typing was assigned using DNR's water typing system (Washington Administrative Code (WAC) 222-16-031).

The locations of oaks were professionally land surveyed. The dripline of individual priority oaks were digitized using 2012 and 2018 aerials.

The critical areas map, including surveyed topography, water boundaries, plot locations, and trees by AKS, is included as Figure 9. Representative ground-level site photographs and a photograph location map are included in Appendix C.

Precipitation Prior to Site Visit

Observed precipitation data were obtained from the Battle Ground, Washington weather station via the National Oceanic Atmospheric Administration (NOAA) Applied Climate Information System (AgACIS). The closest wetlands climate analysis (WETS) station to the project site is the Battle Grounds station.

According to the AgACIS Battle Ground station, 0.03 inches of rainfall was received the day of the site visit and 1.75 inches of rainfall was received for the two weeks prior to the November 14, 2018 site visit.

According to the National Weather Service (NWS) Vancouver station, 0.26 inches of rainfall was recorded on the day of the site visit, and 0.27 inches of rainfall was received for the two weeks prior to March 11th, 2019. Data from the NWS Vancouver weather station was used to calculate precipitation for March 11th and two weeks prior, as current AgACIS Battle Ground station data was unavailable.

Tables 1 and 2 and show antecedent rainfall according to the WETS for the three months prior to the site visits.

Table 1. Precipitation Data Prior to November 14, 2018 Site Visit (Battle Ground WETS)

	Observed	30% Chanc	e Will Have	Condition	Condition Value		Multiply Previous
Prior Months	Precipitation (Inches)	Less Than	More Than	Dry, Wet, Normal	(1=dry, 2=normal, 3=wet)	Month Weight	Two Columns
October 2018	5.52	2.26	5.17	Wet	3	3	9
September 2018	1.51	1.16	2.97	Normal	2	2	4
August 2018	0.40	0.48	1.37	Dry	1	1	1
						Sum	14
							Normal
Rainfall of prior peri	od was: drier tha	n normal (sum	is 6-9), norma	l (sum is 10-14),	wetter than normal	(sum is 15-1	8)

Table 2. Precipitation Data Prior to March 11, 2019 Site Visit (Battle Ground WETS).

	Observed	30% Chan	ce Will Have	Condition	Condition Value (1=dry,		Multiply Previous
Prior Months	Precipitation (Inches)	Less Than	More Than	Dry, Wet, Normal	2=normal, 3=wet)	Month Weight	Two Columns
February 2019	6.87	4.43	7.16	Normal	2	3	6
January 2019	4.43	4.40	8.27	Normal	2	1	2
December 2018	8.03	5.76	8.94	Normal	2	1	2
						Sum	10
			_				Normal

Rainfall of prior period was: **drier** than normal (sum is 6-9), **normal** (sum is 10-14), **wetter** than normal (sum is 15-18)

Observed precipitation for the area prior to our site visit was within the normal range according to WETS; however, the site visit was conducted at the end of the growing season. Therefore, a follow up site visit was conducted on March 11, 2019 to document hydrology in the pasture during the early portion of the growing season. The soil temperature recorded during the March 11, 2019 site visit was 42 degrees Fahrenheit at 12-inches below the ground surface, indicating the site visit was conducted during the early growing season.

Results

Water 1

Water 1 is an intermittent, non-fishbearing (DNR Water Type Ns) stream which flows westerly along the northern boundary. Water 1 extends off-site to the west via an 18-inch diameter culvert under NE Ivy Avenue, where it appears to have a direct hydrologic connection to wetlands adjacent to the East Fork Lewis River. Water 1 originates immediately off-site to the northeast.

Within the study area, the upper reach of the channel bed averages approximately 4-feet wide with 2-foot tall banks. Approximately 4-inches of continuous flow was present in the entire on-site channel reach during the November 2018 site visit. The downstream end contained scour at the culvert inlet under NE Ivy Avenue. The channel is generally unvegetated with scattered giant horsetail (*Equisetum telmateia*; FACW), western lady fern (*Athyrium cyclosorum*; FAC), and Himalayan blackberry growing along the banks. Dominant channel bed substrate consisted of silt loam with scattered gravels and cobbles with some large wood debris.

Water 1 was determined to have an intermittent flow regime (lacks continuous year-round flow), Type Ns stream and therefore has a riparian buffer of 75 feet (LCMC Table 18.300.090.2.f).

Water 2

Water 2 is an intermittent, non-fishbearing (DNR Water Type Ns) stream which is mapped in the south-central portion of the study area. Water 2 extends off-site to the south and appears to have a direct hydrologic connection to wetlands adjacent to the East Fork Lewis River. Within the study area, the channel bed averages approximately 5-8-feet wide and had approximately 2-inches of continuous flow during the November 2018 site visit. The channel bed was unvegetated with scattered giant horsetail, western lady fern, and stinging nettle (*Urtica dioica*; FAC) growing along the banks and below the OHWM.

Water 2 was determined to be have an intermittent flow regime, Type Ns stream and therefore has a riparian buffer of 75 feet.

Water 3

Water 3 is an intermittent, non-fishbearing (DNR Water Type Ns) stream which originates on-site at the bottom of a ravine in the southeastern portion of the study area. Water 3 extends off-site to the south and appears to have a direct hydrologic connection to wetlands adjacent to the East Fork Lewis River. The channel bed is approximately 4-feet wide with 1 foot tall channel banks. Approximately 0.25-inch deep of continuous flow was observed within Water 3 during the November 2018 site visit. The channel is generally unvegetated with western lady fern and Himalayan blackberry growing along the banks.

Water 3 was determined to be an intermittent, Type Ns stream and therefore has a riparian buffer of 75 feet.

Uplands

Plots 1-4 document conditions within pasture located in NRCS mapped hydric soils. Only Plot 2 met hydric soil indicator F6, Redox Dark Surface. Other plots lacked hydric soil indicators. Soils documented on the site did not meet the typical soil profile for the hydric Odne series, which typically consists of a very dark gray (10YR 4/1) chroma containing common, coarse redox concentrations.

The groundwater table at Plots 1-4 was below 12-inches during both the November 14, 2018 and March 11, 2019 site visits, which were conducted during normal rainfall periods. The soil temperature recorded during the March 11, 2019 site visit was 42 degrees Fahrenheit at 12-inches below the ground surface, indicating the site visit was conducted during the early growing season.

The pasture field is relatively flat, lacking topography likely to hold water sufficient to develop wetland characteristics. According to the Geotech report conducted for the site by GeoDesign, January 14, 2019, groundwater in the pasture was encountered between depths of 10 and 14 feet below the surface during their December 2018 site visit. According to their report, based on their experience, the perched groundwater table may rise to only within 5 feet of the ground surface during the wet season.

A small scattered patch of pennyroyal (*Mentha pulegium*) was observed near Plot 2. Pennyroyal is a stoloniferous, creeping plant that is not deeply rooted. The pennyroyal appears to have sustained in areas where the surface soil was compacted from grazing, and not indicative of a high groundwater table. Pennyroyal did not appear to be dominant on the site.

Priority Oregon White Oaks

AKS biologist Taya MacLean met on-site with WDWF biologists David Howe and Julie Grobelny, on February 21, 2019 to verify priority individual oaks on the site. AKS observed six Oregon white oaks with diameters at breast height (DBH) varying from 10 inches to 30 inches throughout the study area that meet WDFW's definition of a priority individual oak tree. The locations of the surveyed priority oaks and associated driplines are shown on attached Figure 9, Appendix A.

WDFW confirmed the large oak located immediately adjacent to the existing house does not meet the definition for a priority oak tree because of its location within a highly disturbed area (residence, nonnative landscaping).

Per LCMC Table 18.300.090.2.a, with consultation with WDFW, the City may allow for a reduced protective buffer around individual priority oak. WDFW confirmed during the February 2019 site visit, 300 foot wide buffers are not required adjacent to on-site priority oaks. The oaks are only priority to the dripline, as delineated by AKS.

Riparian Habitat Area

The riparian buffer adjacent to Water 1 was dominated by a cluster of Douglas fir trees in the northeast. The remainder of the buffer lacked closed tree canopy, with scattered red alder trees. The understory was generally dominated by invasive English ivy (*Hedera helix*) and Himalayan blackberry. Lesser amounts of western sword fern (*Polystichum munitum*) was present scattered throughout the understory. The riparian buffer adjacent to Waters 2, and 3 are predominantly forested, dominated by Douglas fir and bigleaf maple trees. The understory was generally dominant in Himalayan blackberry.

Project

The project avoids impacts to the drainages delineated on the site and the 75-foot riparian buffer associated with Waters 2 and 3. The project also avoids impacts to individual priority oaks mapped on the site. To avoid impact to priority oaks, the drip lines of oaks will be marked in the field with construction fencing prior to the start of construction. The Site Plan is depicted on Figure 10 of Appendix A.

The stormwater pond will avoid encroachment into the 75 foot riparian buffer associated with Water 2. The stormwater outfall pipe will be buried within the riparian buffer to discharge above Water 2. Below ground utilities, such as storm systems, are considered allowed uses within buffers per 18.300.050 (4)(b) of LAMC. The temporary ground disturbance within buffer to install the storm pipe will be replanted with native shrubs to ensure no net loss of buffer functions. No native trees with greater than 6-inch

diameter breast height will be removed to install the storm line. The temporary buffer impacts planting specification table is included in Appendix E.

The site plan requires a buffer reduction adjacent to Type Ns Water 1 in the northern portion of the site. Reduction of the riparian buffer width is necessary to accommodate a well-laid out site plan that meets density requirements and provides a public trail which connects to the City's trail system. A buffer reduction up to 50% of the required buffer width (up to 37.5 feet wide) is allowed per LCMC 18.300.090 (2)(I). The existing condition of the riparian buffer adjacent to Water 1 requiring reduction is primarily dominated by nonnative invasive vegetation (English ivy and Himalayan blackberry). Portions of the buffer reduction area contains gravel driveway and a shop. The reduced buffer width will not significantly reduce the water quality and habitat functions of the remaining buffer. Enhancement to a portion of the remaining buffer, including removal of non-native invasive vegetation species and densely planting with native tees and shrubs, will occur to ensure compliance with City code.

Riparian Buffer Enhancement Plan

To ensure no net loss of riparian buffer function, the site plan includes enhancement to a minimum 0.34 acres of remaining on-site riparian buffer adjacent to Water 1 (riparian buffer enhancement area shown on attached Figure 10, Appendix A). The enhancement area ratio is approximately 1.5 times the riparian habitat buffer encroachment.

The existing condition of the buffer proposed for enhancement can be described as being "degraded", lacking closed canopy of native trees and native shrubs in the understory. The proposed buffer enhancement includes removal of non-native invasive vegetation and densely planting native trees and shrubs to provide a higher quality functioning buffer. The addition of native trees and shrubs will provide shading to improve thermoregulation water quality function, as well as structural diversity to increase wildlife habitat functional opportunity.

A buffer enhancement planting specification table, including recommended plant species and quantities is provided in Appendix D. Appropriate native plant substitutions should be approved by a qualified professional with expertise in native plants.

The buffer enhancement shall occur within the same growing season as the buffer encroachment.

If required, the applicant shall provide a financial security mechanism acceptable to the City.

Performance Standards

The goal of the buffer enhancement is to ensure no net loss of water quality and habitat functions to Water 1. Specific performance standards to ensure that the project is successfully meeting prescribed goals and objectives should be monitored in Years 1, 2, 3, and 5 and will include:

- 1. Invasive plants, including Class A-C noxious weeds listed by Clark County and Himalayan blackberry, will not exceed 20% cover in enhancement areas during all monitoring years.
- 2. Tree and Shrub plant survival rates:
 - o Year 1: 90% survival
 - Year 2: 80% survival
 - Year 3: 75% survival OR at least 70% combined cover of native shrubs and trees (planted and volunteer)
 - Years 4 and 5: 75% survival OR 80% combined cover of native shrubs and trees (planted and volunteer)

Buffer Enhancement Monitoring Plan

Woody enhancement plantings will be monitored and maintained for a minimum of 5 full growing seasons beginning after installation of plantings. Monitoring will consist of establishing an appropriate number of monitoring plot locations across the enhancement area to be assessed in Years 1, 2, 3, and 5. At each plot, the survivorship of planted shrubs and trees; cover of planted or naturally recruited native shrubs and trees; cover of invasive and nonnative vegetation species; and general site observations will be recorded. Representative site photographs will be taken from established photo points across the enhancement area. Vegetation monitoring plot and photo point locations will be determined during the first monitoring year.

Monitoring reports will be submitted to the City by November 1 following the growing seasons of Years 1, 2, 3, and 5. The monitoring report will consist of photographs and a discussion of performance standards, maintenance activities, problems and successes, and any maintenance needs or contingency actions necessary to ensure success of the mitigation project. Success will be achieved when monitoring results indicate that performance standards are being met at the end of the five year monitoring period.

Buffer Enhancement Maintenance Plan

Routine maintenance of the site is necessary to ensure the integrity and success of the mitigation plan. Maintenance and management of the site may include replacement woody plantings, invasive plant management, irrigation (if needed), and garbage removal. Maintenance activities will be guided by scientific results of annual monitoring, corrective measures, and adaptive management recommendations. Adaptive management measures, such as selecting different species for replacement plantings, may be considered if plantings appear to have massive failures.

Statement of Preparation

The information in this report was compiled and prepared under the supervision and direction of the undersigned, qualified professionals per applicable City regulations, including the La Center Critical Areas Ordinance. Information contained in this document should be considered preliminary and used at your own risk until it has been reviewed and approved in writing by the appropriate agencies with jurisdiction over potentially jurisdictional features within the study area.

Fieldwork and report preparation were conducted by the following individuals:

Taya K. MacLean, MS, PWS

Senior Biologist

Fieldwork, Report Preparation

Jaya K. Mac Jean

Stacey Reed, PWS
Senior Wetland Scientist
Site Visit and Report QA/QC

Stacy Reed

Literature Cited and Referenced

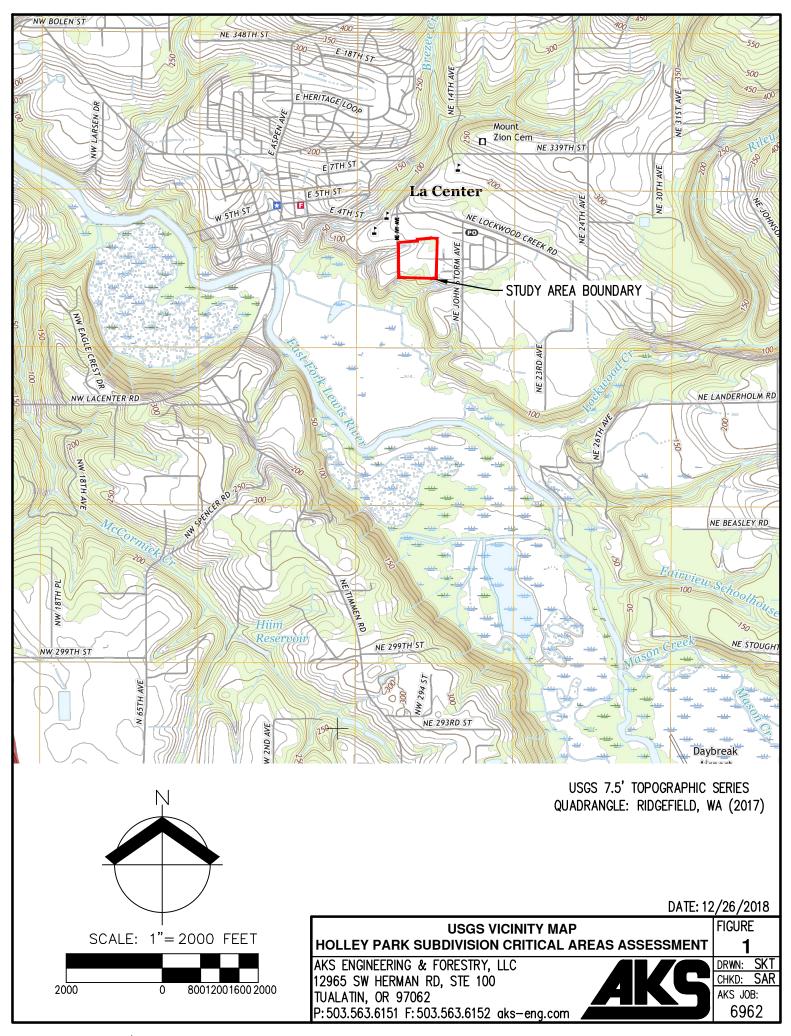
- Anderson, P.S., S. Meyer, P. Olson, and E. Stockdale. 2016. Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State. Department of Ecology, Olympia, Washington, Publication No. 16-06-029
- Clark County. 2018. MapsOnline: Clark County Washington. Vancouver, WA. https://gis.clark.wa.gov/mapsonline/. (Accessed November 2018)
- Environmental Laboratory. 1987. Technical Report Y-87-1. In: *Corps of Engineers Wetlands Delineation Manual*. Vicksburg (MS): U.S. Army Engineer Waterways Experiment Station. Available at: http://el.erdc.usace.army.mil/wetlands/pdfs/wlman87.pdf.
- Hitchcock, C.L., and A. Cronquist. 1973. *Flora of the Pacific Northwest*. Seattle (WA): University of Washington Press.
- Knutson, K. L., and V. L. Naef. 1997. Management recommendations for Washington priority habitats: riparian. Washington State Department of Fish and Wildlife, Olympia, WA. 181pp.
- La Center Municipal Code. 2018. *Critical Areas Ordinance*. Available at: https://www.codepublishing.com/WA/LaCenter/#!/LaCenter18/LaCenter18300.html#18.300
- Lichvar, R.W. 2016. *The National Wetland Plant List: 2016 wetland ratings. Phytoneuron 2013-49: 1-241.* Hanover (NH): U.S. Army Engineer Research and Development Center. Available at: http://rsgisias.crrel.usace.army.mil/NWPL/.
- NOAA Applied Climate Information System (ACIS). *Battle Ground, WA*. Available at: http://agacis.rcc-acis.org/.
- Natural Resources Conservation Service (NRCS). 2014b. *Web soil survey*. Washington (DC): U.S. Department of Agriculture. Available at: http://websoilsurvey.nrcs.usda.gov/app/.
- Schoeneberger, P.J., D.A. Wysocki, E.C. Benham, and W.D. Broderson, eds. 2002. *Field Book for Describing and Sampling Soils, Version 2.0*. Lincoln (NE): U.S. Department of Agriculture Natural Resources Conservation Service, National Soil Survey Center.
- U. S. Fish and Wildlife Service. 2018. National Wetlands Inventory website. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. http://www.fws.gov/wetlands/. (Accessed November 2018)
- Vasilas, L.M., G.W. Hurt, and C.V. Noble, eds. 2010. Field Indicators of Hydric Soils in the United States. A Guide for Identifying and Delineating Hydric Soils, Version 7.0, 2010. Washington (DC): U.S. Department of Agriculture Natural Resources Conservation Service. Available at: http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1046970.pdf.
- Wakeley, J.S., R.W. Lichvar, and C.V. Noble, eds. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0). ERDC/EL TR-10-3. Vicksburg (MS): U.S. Army Engineer Research and Development Center, U.S. Army Corps of Engineers.

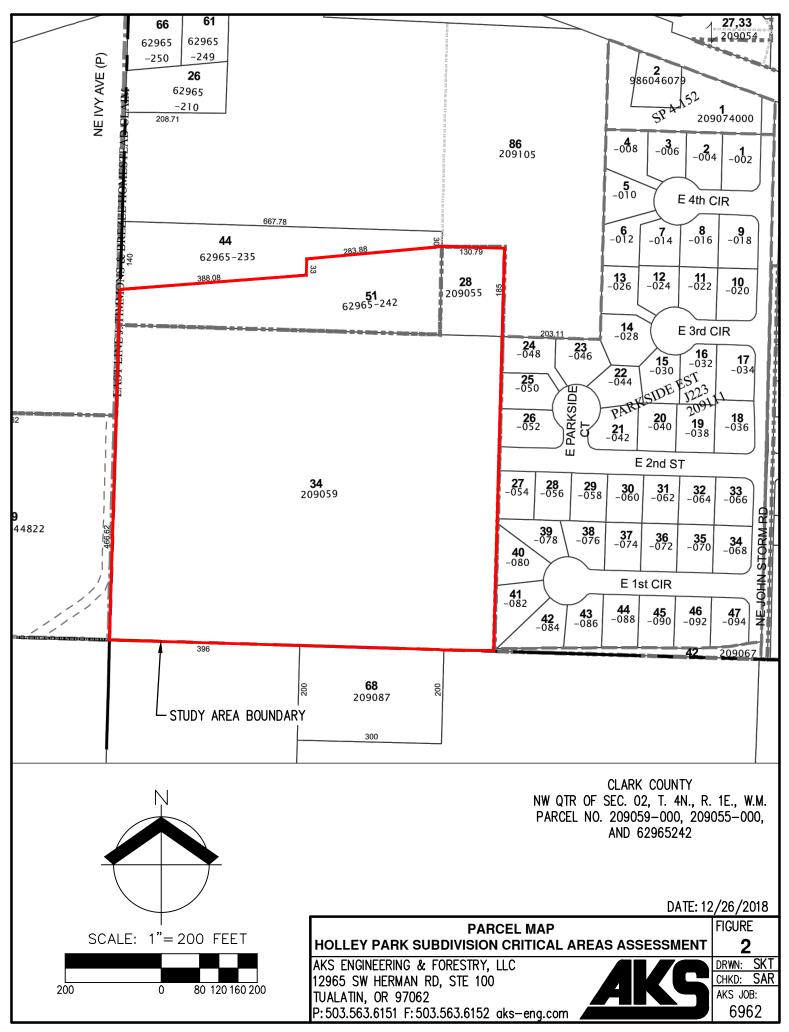


- Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, WA. 296 pp.
- Washington Department of Fish and Wildlife. 2018. Priority Habitats and Species Data. Olympia, WA. https://wdfw.wa.gov/conservation/phs/. (Accessed November 2018)
- Washington Department of Fish and Wildlife. 2018. SalmonScape. Olympia, WA. http://apps.wdfw.wa.gov/salmonscape/. (Accessed November 2018)
- Washington Department of Natural Resources. 2018. Forest Practices Application Mapping Tool. Olympia, WA. https://fpamt.dnr.wa.gov/. (Accessed November 2018)
- Washington Department of Natural Resources. 2018. National Heritage Program Rare Plants and High-Quality Wetlands Database. Olympia, WA. https://www.dnr.wa.gov/NHPwetlandviewer. (Accessed November 2018)



Appendix A: Figures

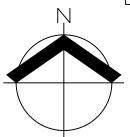




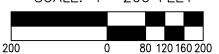


MAP UNIT SYMBOL	MAP UNIT NAME
GeB	GEE SILT LOAM, 0% TO 8% SLOPES; NON-HYDRIC
GeF	GEE SILT LOAM, 30% TO 60% SLOPES; NON-HYDRIC
OdB	ODNE SILT LOAM, 0% OT 5% SLOPES; HYDRIC

NRCS WEB SOIL SURVEY FOR CLARK COUNTY



SCALE: 1"= 200 FEET



NRCS SOIL SURVEY MAP
HOLLEY PARK SUBDIVISION CRITICAL AREAS ASSESSMENT

AKS ENGINEERING & FORESTRY, LLC 12965 SW HERMAN RD, STE 100 TUALATIN, OR 97062 P:503.563.6151 F:503.563.6152 aks-eng.com

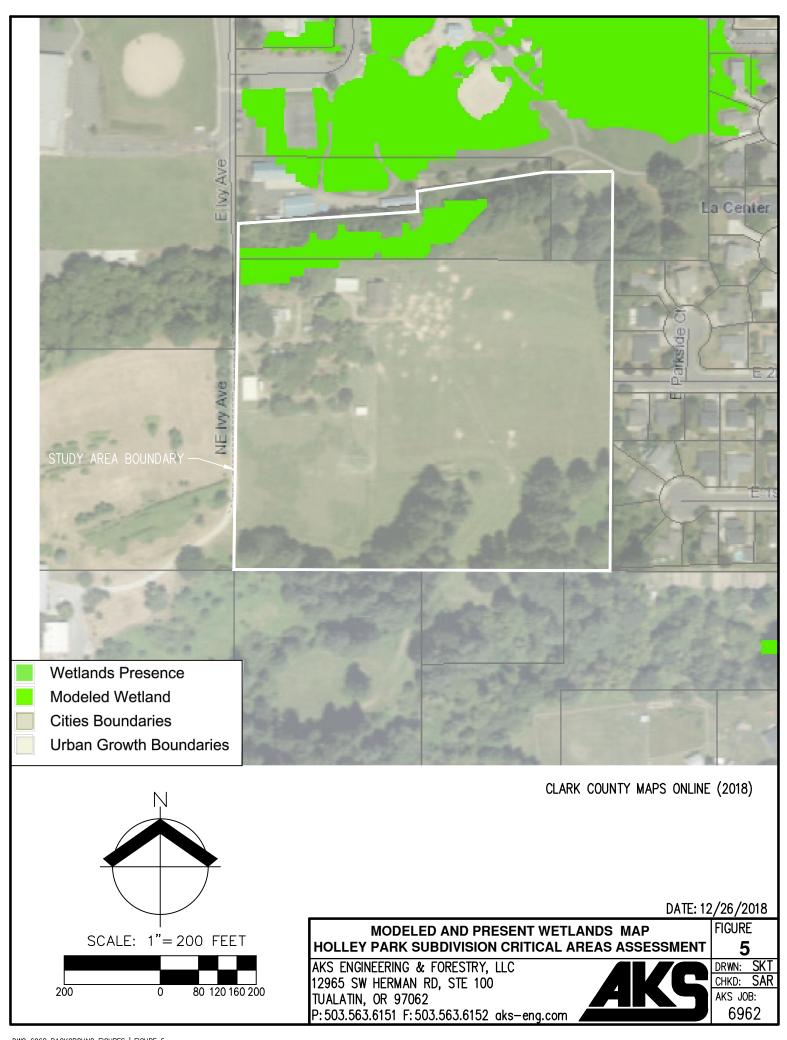


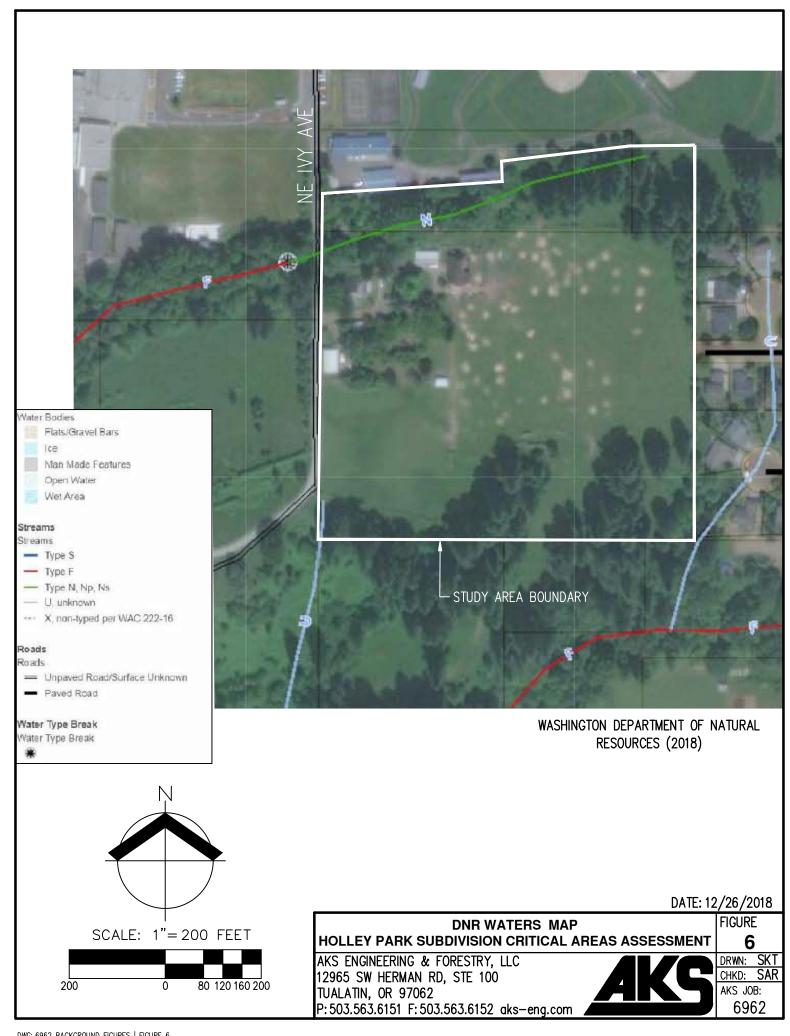
DATE: 12/26/2018 FIGURE

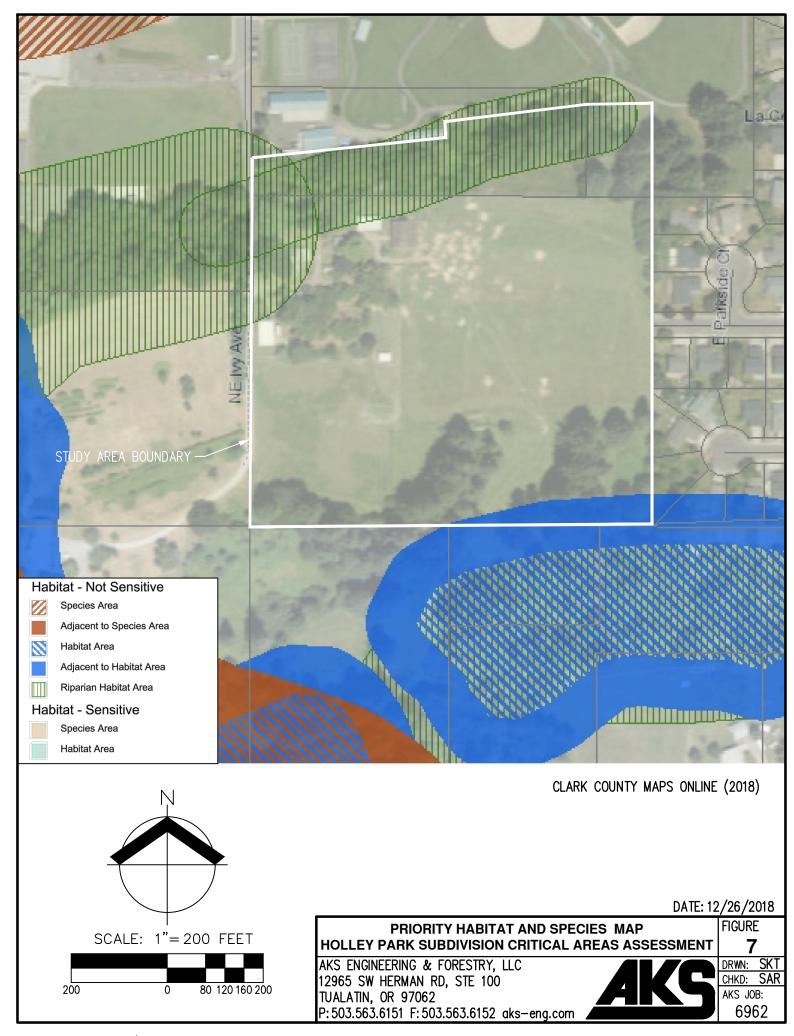
 $\begin{array}{c|c} \textbf{3} \\ \text{DRWN:} & \textbf{SKT} \\ \text{CHKD:} & \textbf{SAR} \\ \text{AKS JOB:} \end{array}$

6962

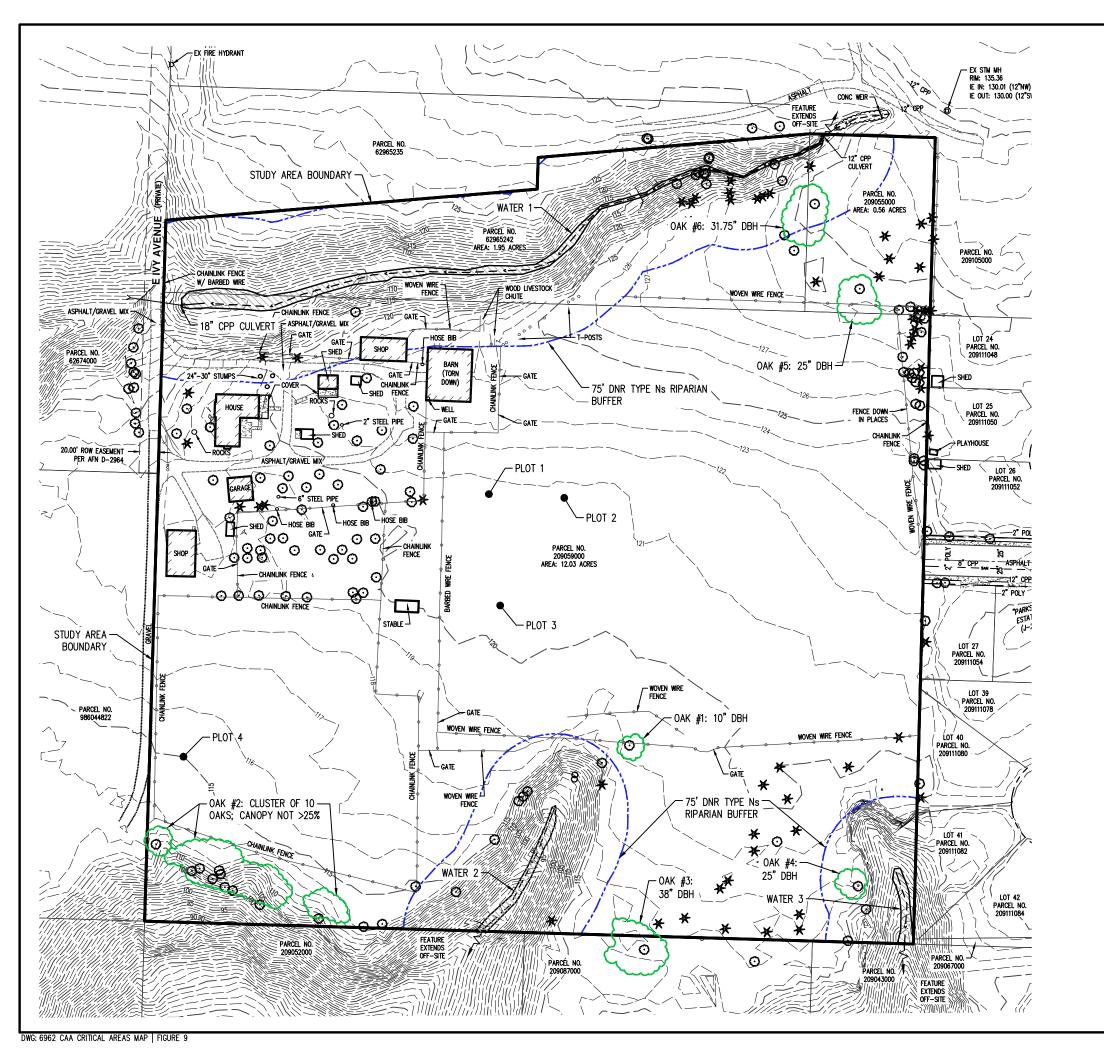












LEGEND

TOTAL ON-SITE WATER AREA: 7,911 SF± (0.18 ACRES±)

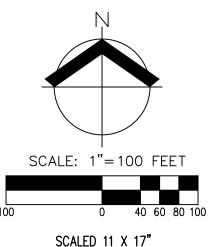
> WATER 1 (NS): 5,753 SF± (0.13 ACRES±) WATER 2 (NS): 1,271 SF± (0.03 ACRES±)

WATER 3 (NS): 887 SF±

TOTAL ON-SITE 75' RIPARIAN BUFFER: 146,943 SF± (3.37 ACRES±)



TOTAL INDIVIDUAL PRIORITY OREGON WHITE OAK DRIPLINE- BASED OFF OF SUMMER 2012 AERIAL: 15,148 SF± (0.35 ACRES±)



DATE: 03/14/2019

FIGURE

9

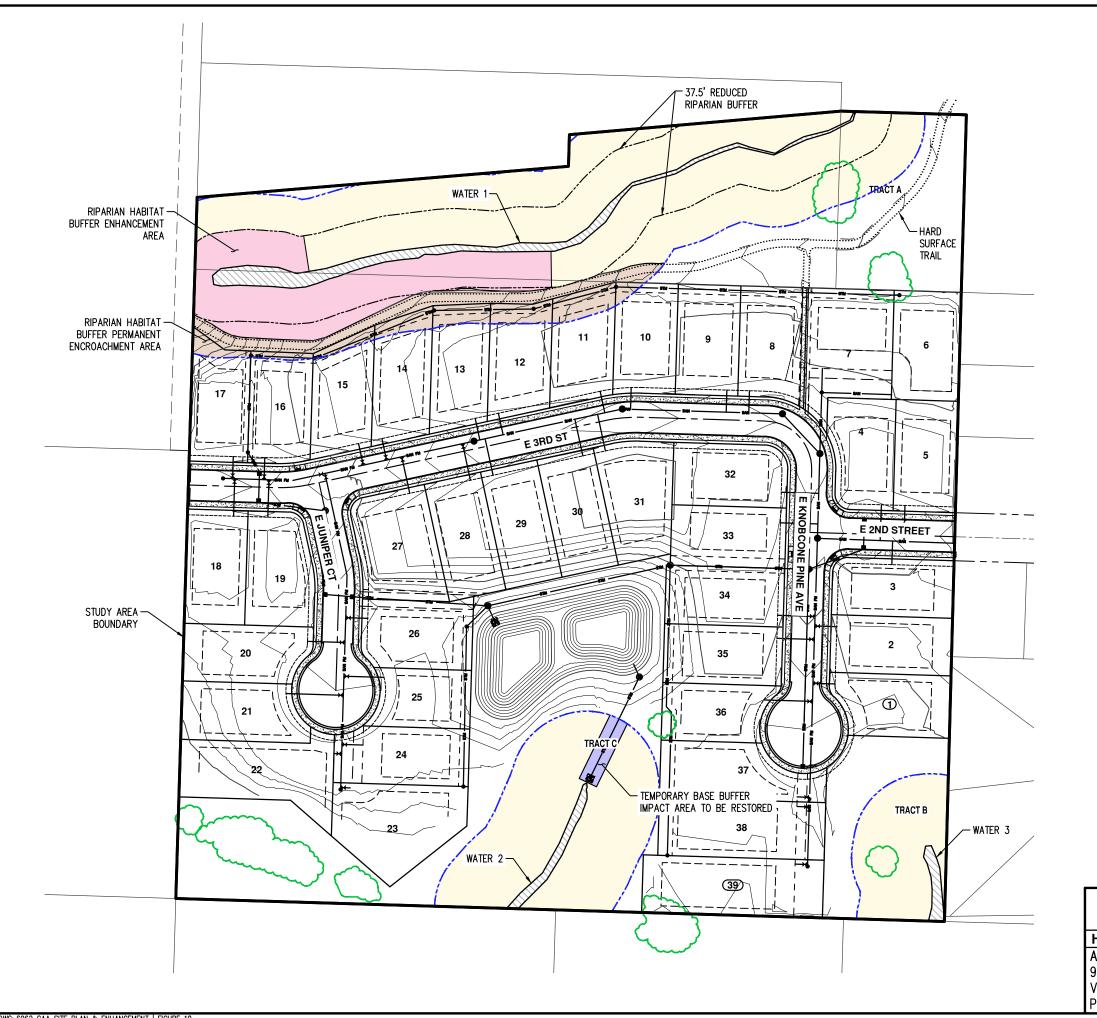
CRITICAL AREAS MAP

HOLLEY PARK SUBDIVISION CRITICAL AREAS ASSESSMENT

AKS ENGINEERING & FORESTRY, LLC 9600 NE 126TH AVE, STE 2520 VANCOUVER, WA 98682 P: 360.882.0419 F: 360.882.0426 aks-eng.com



DRWN: KMK CHKD: SAR AKS JOB: 6962



LEGEND

TOTAL ON-SITE WATER AREA: 7,911 SF± (0.18 ACRES±)

75' BASE RIPARIAN BUFFER



TOTAL INDIVIDUAL PRIORITY OREGON WHITE OAKS TO BE PRESERVED: 15,148 SF± (0.35 ACRES±)



RIPARIAN HABITAT BUFFER ENHANCEMENT AREA: 22,038 SF± (0.51 ACRES±)



RIPARIAN HABITAT BUFFER ENCROACHMENT INTO BASE BUFFER AREA: 14,691 SF± (0.34 ACRES±)

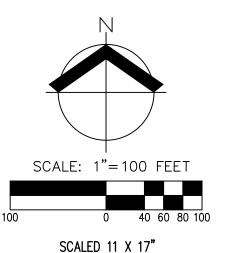


TEMPORARY IMPACTS TO BASE BUFFER AREA TO BE RESTORED: 1,475 SF± (0.03 ACRES±)



TOTAL REMAINING ON-SITE RIPARIAN BUFFER (NOT INCLUDING ENHANCEMENT AREA): 108,740 SF± (2.50 ACRES±)

NOTE: OAK DRIPLINE AVOIDANCE AREAS WILL BE NOTED ON CONSTRUCTION DRAWINGS.



DATE: 03/14/2019

FIGURE

10

6962

SITE PLAN

HOLLEY PARK SUBDIVISION CRITICAL AREAS ASSESSMENT

AKS ENGINEERING & FORESTRY, LLC 9600 NE 126TH AVE, STE 2520 VANCOUVER, WA 98682 P: 360.882.0419 F: 360.882.0426 aks-eng.com





Appendix B: Wetland Determination Data Sheets

Project/Site: Holley Park Subdivision		City/Count	tv: La Center / Cl	ark	Sampling Date:	11/14/2018
Applicant/Owner: Compass Group LLC			.,. <u>===================================</u>	State: WA	· · ·	oint: 1
Investigator(s): Taya MacLean and Sonya Temp	leton	Section	. Township, Rand	ge: Sect 02, T4N, R3E		
Landform (hillslope, terrace, etc.): Shoulder SI				concave, convex, none):	None S	Slope (%): <3%
Subregion (LRR): A, Northwest Forests and Coa	st	Lat:	•	ng:		,
Soil Map Unit Name: Unit OdB, Odne sill			_		assification:	
Are climatic / hydrologic conditions on the site typ	ical for this time of	f year?	Ye		(If no, explain	
Are Vegetation, Soil	, or Hydrology	significantly di		re "Normal Circumstances	" present?	Yes X No
Are Vegetation, Soil	, or Hydrology	naturally probl	ematic? (If	f needed, explain any ansv	wers in Remarks.)	
SUMMARY OF FINDINGS - Attach s	te map show	ing sampling p	oint location	s, transects, impor	tant features,	etc.
Hydrophytic Vegetation Present?	Yes X	No	1			
Hydric Soil Present?	Yes	No X	Is the Sampl			
Wetland Hydrology Present?	Yes	No <u>X</u>	within a Wet	land? Yes	No <u>X</u>	· <u>·</u>
Precipitation: According to the AgACIS Battle Ground station, 0 prior Remarks:	.03 inches of rainf	all was received the	day of the site v	isit and 1.75 inches of rain	fall was received t	for the two weeks
Plot is located in grazed pasture.						
VEGETATION						
	Absolute	Dominant	Indicator	Dominance Test worl	ksheet:	
Tree Stratum (Plot Size: 30' r or)	% Cover	Species?	Status	Number of Dominant S	Species	
1.				That Are OBL, FACW,	or FAC:	2 (A)
2.						
3.				Total Number of Domir	nant	
4.				Species Across All Stra	ata:	2 (B)
	0%	= Total Cover				
Sapling/Shrub Stratum (Plot Size: 10' r or)			Percent of Dominant S	pecies	
1				That Are OBL, FACW,	or FAC:	100% (A/B)
2			·	Prevalence Index wo		
3.			·	Total % Cover of:	Multiply by:	
4				OBL species 5	x 1 =	5
5				FACW species 0	x 2 =	0
	0% =	= Total Cover		FAC species 80		240
Herb Stratum (Plot Size: 5' r or)				FACU species 10		40
1. Agrostis species	40%	Yes	FAC?	UPL species 5	x 5 =	25
2. Alopecurus pratensis	25%	Yes	<u>FAC</u>	Column Totals: 100		310 (B)
3. <u>Trifolium repens</u>	15%	No	FAC	Prevalence Index		3.10
4. Hypochaeris radicata	5%	<u>No</u>	FACU	Hydrophytic Vegetati		
5. <u>Daucus carota</u>	5%	No No	FACU	1 - Rapid Test for I	, , ,	lation
6. Mentha pulegium	5%	No No	OBL			
7. <u>Geranium molle</u>	5%	No	NOL	3 - Prevalence Ind		data a companyation o
8.	-			4 - Morphological A	•	•
9. 10.				5 - Wetland Non-V	s or on a separate	: Sileet)
11.	-			Problematic Hydro		(Evplain) ¹
· ·	4000/	- Tatal Cavar		¹ Indicators of hydric so		
Woody Vine Stratum (Plot Size: 10' r or)	100%=	= Total Cover		be present.	iii and welland nyd	Irology must
2.				Hydrophytic		
% Bare Ground in Herb Stratum 0%	0% =	= Total Cover		Vegetation Yesent?	Yes X No	
Remarks:				<u> </u>		

OIL								
			ed to document the			ence of indicators)		
Depth	Matrix				Features 1	. 2	_	
	color (moist)	%	Color (moist)	<u></u> %	Type ¹	Loc ²	Texture	Remark
0-16	10YR 3/2	98	7.5YR 3/4	2	C	M	SiL	
vne: C=Concentrat	tion D=Depletion	n RM=Reduce	ed Matrix CS=Cover	ed or Coated S	and Grains			
ocation: PL=Pore L	•							
dric Soil Indicator	rs (Applicable t	o all LRRs, u	nless otherwise not	ted):		Indicators for F	Problematic Hydric S	ioils³:
Histosol (A1)		_	Sandy Redox (S	5)		2 cm Muck	(A10)	
_Histic Epipedon (•	_	Stripped Matrix (-			Material (TF2)	
Black Histic (A3)		_	Loamy Mucky Mi		ept MLRA 1)		w Dark Surface (TF12	!)
_ Hydrogen Sulfide	e (A4)	_	Loamy Gleyed M	latrix (F2)		Other (Expl	ain in Remarks)	
_Depleted Below [Dark Surface (A	11)	Depleted Matrix ((F3)				
Thick Dark Surfa	ice (A12)	_	Redox Dark Surf	ace (F6)		³ Indicators of h	drophytic vegetation a	and wetland
_Sandy Mucky Mir	neral (S1)	_	Depleted Dark Si	urface (F7)			be present, unless dis	
Sandy Gleyed Ma	atrix (S4)		Redox Depression	ons (F8)		problematic.		
strictive Layer (if	present):							
						Handela Oall		
Туре:						Hydric Soil		
Depth (inches):						Present?	Yes	No X
Depth (inches):	Indicators					-	Yes	No X
Pepth (inches): Pemarks: YDROLOGY Petland Hydrology		equired: check	all that apply)			Present?		
marks: YDROLOGY etland Hydrology mary Indicators (m	inimum of one re	equired; check		- payes (R0) (evr	cent MI PA	Present? Secondary India	cators (2 or more requ	ired)
Popper (inches): PMOLOGY Petland Hydrology I Mary Indicators (m Surface Water (A	ninimum of one re	equired; check	Water-Stained Le		cept MLRA	Present? Secondary India Water-Stain	cators (2 or more requ ed Leaves (B9) (MLR	ired)
marks: /DROLOGY etland Hydrology mary Indicators (m Surface Water (A High Water Table	ninimum of one re	equired; check	Water-Stained Le		pept MLRA	Secondary Indic Water-Stain 4A, and 4	cators (2 or more requ ed Leaves (B9) (MLR (B)	ired)
Popper (inches): The properties of the properti	ninimum of one re A1) e (A2)	equired; check	Water-Stained Le 1, 2, 4A, and 4 Salt Crust (B11)	4B)	cept MLRA	Secondary Indic Water-Stain 4A, and 4 Drainage Pa	eators (2 or more requ ed Leaves (B9) (MLR IB) atterns (B10)	ired)
Popper (inches): The property of the property	ninimum of one re A1) e (A2)	equired; check - - -	Water-Stained Le 1, 2, 4A, and 4 Salt Crust (B11) Aquatic Invertebr	4B) rates (B13)	cept MLRA	Secondary Indic Water-Stain 4A, and 4 Drainage Pa	eators (2 or more requ ed Leaves (B9) (MLR B) atterns (B10) Water Table (C2)	<u>ired)</u> A 1, 2,
Popper (inches): TOROLOGY Setland Hydrology Imary Indicators (m. Surface Water (A. High Water Table Saturation (A3) Water Marks (B1) Sediment Deposit	ninimum of one re A1) e (A2)) its (B2)	equired; check - - - -	Water-Stained Le 1, 2, 4A, and 4 Salt Crust (B11) Aquatic Invertebr Hydrogen Sulfide	rates (B13) e Odor (C1)		Secondary India Water-Stain 4A, and 4 Drainage Pa Dry-Season Saturation \	eators (2 or more requested Leaves (B9) (MLR B) atterns (B10) Water Table (C2) //isible on Aerial Image	<u>ired)</u> A 1, 2,
Popper (inches): The population of the populati	ninimum of one re A1) e (A2)) its (B2) 3)	equired; check - - - - -	Water-Stained Le 1, 2, 4A, and 4 Salt Crust (B11) Aquatic Invertebr Hydrogen Sulfide Oxidized Rhizosp	rates (B13) e Odor (C1) pheres along Li		Secondary India Water-Stain 4A, and 4 Drainage Pa Dry-Season Saturation \ Geomorphic	eators (2 or more requived Leaves (B9) (MLR BB) atterns (B10) Water Table (C2) /isible on Aerial Image	<u>ired)</u> A 1, 2,
Poppth (inches): marks: YDROLOGY etland Hydrology I mary Indicators (m Surface Water (A High Water Table Saturation (A3) Water Marks (B1 Sediment Deposit Drift Deposits (B3 Algal Mat or Crus	ninimum of one re	equired; check	Water-Stained Le 1, 2, 4A, and 4 Salt Crust (B11) Aquatic Invertebr Hydrogen Sulfide Oxidized Rhizosp Presence of Red	rates (B13) e Odor (C1) pheres along Li luced Iron (C4)	ving Roots (C3)	Secondary Indic Water-Stain 4A, and 4 Drainage Pa Dry-Season Saturation \ Geomorphic Shallow Aqu	eators (2 or more requed Leaves (B9) (MLR B) atterns (B10) Water Table (C2) //isible on Aerial Image continue (D2) uitard (D3)	<u>ired)</u> A 1, 2,
Popper (inches): Pararks: Pydrology Petland Hydrology Imary Indicators (m Surface Water (A High Water Table Saturation (A3) Water Marks (B1 Sediment Deposit Drift Deposits (B3 Algal Mat or Crus Iron Deposits (B8	ninimum of one re A1) e (A2)) its (B2) 3) st (B4)	equired; check	Water-Stained Le 1, 2, 4A, and 4 Salt Crust (B11) Aquatic Invertebr Hydrogen Sulfide Oxidized Rhizosp Presence of Red Recent Iron Redu	rates (B13) e Odor (C1) pheres along Li luced Iron (C4) uction in Tilled	ving Roots (C3) Soils (C6)	Secondary Indic Water-Stain 4A, and 4 Drainage Pa Dry-Season Saturation \ Geomorphic Shallow Aqu	eators (2 or more required Leaves (B9) (MLR B) atterns (B10) Water Table (C2) //isible on Aerial Image C Position (D2) uitard (D3)	ired) A 1, 2, ery (C9)
Popper (inches): The property of the property	ninimum of one re A1) e (A2)) its (B2) 3) st (B4) 5) cks (B6)	- - - - -	Water-Stained Le 1, 2, 4A, and 4 Salt Crust (B11) Aquatic Invertebr Hydrogen Sulfide Oxidized Rhizosp Presence of Red Recent Iron Redu Stunted or Stress	rates (B13) e Odor (C1) pheres along Li luced Iron (C4) uction in Tilled sed Plants (D1)	ving Roots (C3) Soils (C6)	Secondary Indic Water-Stain 4A, and 4 Drainage Pa Dry-Season Saturation \ Geomorphic Shallow Aqu FAC-Neutra Raised Ant	eators (2 or more required Leaves (B9) (MLR B) atterns (B10) Water Table (C2) Visible on Aerial Image Position (D2) uitard (D3) Il Test (D5) Mounds (D6) (LRR A)	ired) A 1, 2, ery (C9)
marks: //DROLOGY etland Hydrology betained Hydrolo	ninimum of one re A1) e (A2)) its (B2) 3) st (B4) 5) cks (B6) e on Aerial Imag	- - - - ery (B7)	Water-Stained Le 1, 2, 4A, and 4 Salt Crust (B11) Aquatic Invertebr Hydrogen Sulfide Oxidized Rhizosp Presence of Red Recent Iron Redu	rates (B13) e Odor (C1) pheres along Li luced Iron (C4) uction in Tilled sed Plants (D1)	ving Roots (C3) Soils (C6)	Secondary Indic Water-Stain 4A, and 4 Drainage Pa Dry-Season Saturation \ Geomorphic Shallow Aqu FAC-Neutra Raised Ant	eators (2 or more required Leaves (B9) (MLR B) atterns (B10) Water Table (C2) //isible on Aerial Image C Position (D2) uitard (D3)	ired) A 1, 2, ery (C9)
Poppth (inches): The property of the property	ninimum of one re A1) e (A2)) its (B2) 3) st (B4) 5) cks (B6) e on Aerial Imag ted Concave Sur	- - - - ery (B7)	Water-Stained Le 1, 2, 4A, and 4 Salt Crust (B11) Aquatic Invertebr Hydrogen Sulfide Oxidized Rhizosp Presence of Red Recent Iron Redu Stunted or Stress	rates (B13) e Odor (C1) pheres along Li luced Iron (C4) uction in Tilled sed Plants (D1)	ving Roots (C3) Soils (C6)	Secondary India Water-Stain 4A, and 4 Drainage Pa Dry-Season Saturation \ Geomorphic Shallow Aqı FAC-Neutra Raised Ant Frost-Heave	eators (2 or more required Leaves (B9) (MLR B) atterns (B10) Water Table (C2) Visible on Aerial Image Position (D2) uitard (D3) Il Test (D5) Mounds (D6) (LRR A)	ired) A 1, 2, ery (C9)
Poppth (inches): marks: YDROLOGY etland Hydrology Imary Indicators (m. Surface Water (A. High Water Tables Saturation (A3) Water Marks (B1 Sediment Deposits (B3 Algal Mat or Cruster Iron Deposits (B3 Surface Soil Cracter Inundation Visibles Sparsely Vegetated Seld Observations: urface Water Preserval	inimum of one re (A1) e (A2)) its (B2) (B4) (Compared to the compared to the	- - - - ery (B7) - face (B8)	Water-Stained Le 1, 2, 4A, and 4 Salt Crust (B11) Aquatic Invertebr Hydrogen Sulfide Oxidized Rhizosp Presence of Red Recent Iron Redu Stunted or Stress Other (Explain in	rates (B13) e Odor (C1) pheres along Li luced Iron (C4) luction in Tilled sed Plants (D1) Remarks)	ving Roots (C3) Soils (C6) (LRR A)	Secondary Indic Water-Stain 4A, and 4 Drainage Pa Dry-Season Saturation \ Geomorphic Shallow Aqu FAC-Neutra Raised Ant	eators (2 or more required Leaves (B9) (MLR B) atterns (B10) Water Table (C2) Visible on Aerial Image Position (D2) uitard (D3) Il Test (D5) Mounds (D6) (LRR A)	ired) A 1, 2, ery (C9)
Poppth (inches): marks: YDROLOGY etland Hydrology Imary Indicators (m. Surface Water (A. High Water Tables Saturation (A3) Water Marks (B1 Sediment Deposits (B3 Algal Mat or Cruster Iron Deposits (B3 Surface Soil Cracter Inundation Visibles Sparsely Vegetated Seld Observations: urface Water Preserval	inimum of one re (A1) e (A2)) its (B2) (B4) (Compared to the compared to the	ery (B7)	Water-Stained Le 1, 2, 4A, and 4 Salt Crust (B11) Aquatic Invertebr Hydrogen Sulfide Oxidized Rhizosp Presence of Red Recent Iron Redu Stunted or Stress Other (Explain in	rates (B13) e Odor (C1) pheres along Li luced Iron (C4) uction in Tilled sed Plants (D1) Remarks)	ving Roots (C3) Soils (C6) (LRR A) s):s):>16"	Secondary India Water-Stain 4A, and 4 Drainage Pa Dry-Season Saturation \ Geomorphic Shallow Aqı FAC-Neutra Raised Ant Frost-Heave	eators (2 or more required Leaves (B9) (MLR B) atterns (B10) Water Table (C2) Visible on Aerial Image Position (D2) uitard (D3) Il Test (D5) Mounds (D6) (LRR A)	ired) A 1, 2, ery (C9)
Poepth (inches): Pomarks: Pydrology etland Hydrology I imary Indicators (m Surface Water (A High Water Table Saturation (A3) Water Marks (B1 Sediment Deposits (B3 Algal Mat or Cruster Iron Deposits (B5 Surface Soil Cracter Inundation Visible Sparsely Vegetate Inches Inc	ainimum of one re A1) e (A2)) its (B2) 3) st (B4) 5) cks (B6) e on Aerial Imageted Concave Sure ent? Yes Yes	ery (B7)	Water-Stained Le 1, 2, 4A, and 4 Salt Crust (B11) Aquatic Invertebr Hydrogen Sulfide Oxidized Rhizosp Presence of Red Recent Iron Redu Stunted or Stress Other (Explain in	rates (B13) e Odor (C1) pheres along Li luced Iron (C4) luction in Tilled sed Plants (D1) Remarks)	ving Roots (C3) Soils (C6) (LRR A) s):s):s):	Secondary India Water-Stain 4A, and 4 Drainage Pa Dry-Season Saturation \ Geomorphic Shallow Aqu FAC-Neutra Raised Ant Frost-Heave	eators (2 or more requested Leaves (B9) (MLR eaterns (B10)) Water Table (C2) /isible on Aerial Image Position (D2) uitard (D3) Il Test (D5) Mounds (D6) (LRR A)	ired) A 1, 2, ery (C9)
Popth (inches): Popth	ainimum of one re A1) e (A2)) its (B2) 3) st (B4) 5) cks (B6) e on Aerial Imag ted Concave Sur ent? Yes ent? Yes Yes nge)	ery (B7)	Water-Stained Le 1, 2, 4A, and 4 Salt Crust (B11) Aquatic Invertebr Hydrogen Sulfide Oxidized Rhizosp Presence of Red Recent Iron Redu Stunted or Stress Other (Explain in	rates (B13) e Odor (C1) pheres along Li luced Iron (C4) uction in Tilled sed Plants (D1) Remarks) Depth (inches Depth (inches	ving Roots (C3) Soils (C6) (LRR A) s):	Secondary India Water-Stain 4A, and 4 Drainage Pa Dry-Season Saturation N Geomorphic Shallow Aqu FAC-Neutra Raised Ant Frost-Heave Wetland Hydrology Present?	eators (2 or more requested Leaves (B9) (MLR eaterns (B10)) Water Table (C2) /isible on Aerial Image Position (D2) uitard (D3) Il Test (D5) Mounds (D6) (LRR A)	ired) A 1, 2, ery (C9)
Poepth (inches): Pomarks: Pydrology etland Hydrology I imary Indicators (m Surface Water (A High Water Table Saturation (A3) Water Marks (B1 Sediment Deposit Drift Deposits (B3 Algal Mat or Crus Iron Deposits (B5 Surface Soil Crac Inundation Visible Sparsely Vegetat eld Observations: urface Water Present aturation Present? includes capillary frince	ainimum of one re A1) e (A2)) its (B2) 3) st (B4) 5) cks (B6) e on Aerial Imag ted Concave Sur ent? Yes ent? Yes Yes nge)	ery (B7)	Water-Stained Le 1, 2, 4A, and 4 Salt Crust (B11) Aquatic Invertebr Hydrogen Sulfide Oxidized Rhizosp Presence of Red Recent Iron Redu Stunted or Stress Other (Explain in	rates (B13) e Odor (C1) pheres along Li luced Iron (C4) uction in Tilled sed Plants (D1) Remarks) Depth (inches Depth (inches	ving Roots (C3) Soils (C6) (LRR A) s):	Secondary India Water-Stain 4A, and 4 Drainage Pa Dry-Season Saturation N Geomorphic Shallow Aqu FAC-Neutra Raised Ant Frost-Heave Wetland Hydrology Present?	eators (2 or more requested Leaves (B9) (MLR eaterns (B10)) Water Table (C2) /isible on Aerial Image Position (D2) uitard (D3) Il Test (D5) Mounds (D6) (LRR A)	ired) A 1, 2, ery (C9)

Project/Site: H	lolley Park Subdivi	sion		City/Count	y: La Center / C	lark	Sampling Date	: 11/14/	2018
Applicant/Owner:	Compass Group	LLC				State: WA		Point:	
Investigator(s): T	aya MacLean and	Sonya Templeton		Section,		ge: Sect 02, T4N, R3E			
Landform (hillslop	e, terrace, etc.):	Shoulder Slope			Local relief (d	concave, convex, none): _	None	Slope (%):	<3%
Subregion (LRR):	A, Northwest For	ests and Coast		Lat:	Lo	ng:	Datum	:	
Soil Map Unit Nan		dB, Odne silt loam				NWI c	lassification:		
•	•	on the site typical fo		•		es X No			
Are Vegetation	, Soil	, or i	Hydrology Hydrology	significantly dis	Sturbed? A	re "Normal Circumstance If needed, explain any ans			NO
						ns, transects, impo		•	
Hydrophytic Vege					OITIL IOCALIOI	is, transects, impor	tant leatures	s, etc.	
Hydric Soil Prese			X		Is the Sampl	led Area			
Wetland Hydrolog					within a Wet	tland? Yes	No	X	
Precipitation: According to the Aprior					day of the site v	risit and 1.75 inches of rai			weeks
Remarks: Plot located in pas									
VEGETATION	1								
			Absolute	Dominant	Indicator	Dominance Test wo			
Tree Stratum (Plo	ot Size: 30' r or)	% Cover	Species?	<u>Status</u>	Number of Dominant	•		
2.						That Are OBL, FACW	, or FAC:	2 ((A)
3.						Total Number of Dom	inant		
4.				· —		Species Across All St		2 ((B)
			0%	= Total Cover		Opecies Across Air or		(,6)
Sapling/Shrub Str	atum (Plot Size: 1	0'ror)	0 70	- Total Cover		Percent of Dominant	Species		
1.						That Are OBL, FACW	•	<u>100%</u> ((A/B)
2.						Prevalence Index wo		,	
3.						Total % Cover of	: Multiply by:		
4						OBL species 5	x 1 =	5	
5.				<u> </u>			x 2 =	0	
		<u>-</u>	0%	= Total Cover			0 x 3 =	270	
Herb Stratum (Plo)					x 4 =	20	_
1. Agrostis spec	cies		70%	Yes	FAC ?	UPL species (0	— _(D)
Poa species Hypochaeris	un dinn to		20%	Yes	FAC ?	Column Totals: 10 Prevalence Inde:	<u>)0</u> (Α) x = Β/Δ =	295 2.95	(B)
 Hypochaeris Mentha puleg 			5% 5%	No No	FACU OBL	Hydrophytic Vegeta		2.00	
5.	jiuiii		370	INO	OBL	1 - Rapid Test for		etation	
6.						X 2 - Dominance Te	st is >50%		
7.						X 3 - Prevalence Inc	dex is≤3.0 ¹		
8.						4 - Morphological	Adaptations ¹ (Pro	ovide suppor	ting
9.						data in Remar	ks or on a separa	ite sheet)	
10.						5 - Wetland Non-	/ascular Plants ¹		
11						Problematic Hydro	ophytic Vegetatio	n (Explain) ¹	
Woody Vine Strate	um (Plot Size: 10'	ror)	100%	= Total Cover		¹ Indicators of hydric s be present.	oil and wetland h	ydrology mus	st
2.				<u> </u>		Hydrophytic			
% Bare Ground in	Herb Stratum	0%	0%	= Total Cover		Vegetation Present?	Yes X No		
Remarks:						ı			

SOIL							Sampling Point:	2
Profile Descrip	otion (Describe to th	e depth neede	d to document the	e indicator or o	onfirm the abse	nce of indicators):	
Depth	Matri	x		Redox	Features			
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
0-8	10YR 3/2	95	7.5YR 3/4	5	С	M	SiL	
8-16	10YR 3/2	95	7.5YR 4/4	5	C	M	SiL	
	<u> </u>						- <u></u>	
	<u> </u>						- <u></u>	
_ * .	entration, D=Depletion		d Matrix CS=Cover	red or Coated S	and Grains.			
Location: PL=F	Pore Lining, M=Matrix	(.						
Hydric Soil Ind	icators (Applicable	to all LRRs, un	less otherwise no	ted):		Indicators for	Problematic Hydric S	oils³:
Histosol (A	1)		Sandy Redox (S	5)		2 cm Muck	(A10)	
Histic Epipe	edon (A2)		Stripped Matrix ((S6)		Red Paren	t Material (TF2)	
Black Histic	c (A3)		Loamy Mucky M	ineral (F1) (exc	ept MLRA 1)	Very Shallo	ow Dark Surface (TF12))
Hydrogen S	Sulfide (A4)		Loamy Gleyed N	Natrix (F2)		Other (Exp	lain in Remarks)	
Depleted B	elow Dark Surface (A	.11)	Depleted Matrix	(F3)				
Thick Dark	Surface (A12)	×	Redox Dark Sur	face (F6)		³ Indicators of h	ydrophytic vegetation a	nd wetland
Sandy Muc	ky Mineral (S1)		Depleted Dark S	Surface (F7)			t be present, unless dis	
Sandy Gley	ved Matrix (S4)		Redox Depressi	ons (F8)		problematic.		
Restrictive Lay	er (if present):							
Ty	pe:					Hydric Soil		
Depth (inches):					Present?	Yes X	No
Remarks:	•	-					·	
Remarks.								
HYDROLOG	Υ							
Wetland Hydro	logy Indicators:							
Primary Indicate	ors (minimum of one r	required; check a	all that apply)	_		Secondary Indi	icators (2 or more requi	red)
Surface Wa	ater (A1)		Water-Stained L	eaves (B9) (exc	cept MLRA	Water-Stai	ned Leaves (B9) (MLR/	\ 1, 2,
High Water	Table (A2)		1, 2, 4A, and	4B)		4A, and	4B)	
Saturation ((A3)		Salt Crust (B11)			Drainage F	Patterns (B10)	
Water Mark	(S (B1)		Aquatic Inverteb	rates (B13)		Dry-Seaso	n Water Table (C2)	
Sediment D	Deposits (B2)		Hydrogen Sulfid	e Odor (C1)		Saturation	Visible on Aerial Image	ry (C9)
Drift Depos	its (B3)		Oxidized Rhizos	pheres along Li	iving Roots (C3)	Geomorphi	ic Position (D2)	
Algal Mat o	r Crust (B4)		Presence of Rec	duced Iron (C4)		Shallow Ac	quitard (D3)	
Iron Deposi	its (B5)		Recent Iron Red	uction in Tilled	Soils (C6)	FAC-Neutr	al Test (D5)	
Surface So	il Cracks (B6)		Stunted or Stres	sed Plants (D1)	(LRR A)	Raised Ant	Mounds (D6) (LRR A)	
Inundation	Visible on Aerial Imag	gery (B7)	Other (Explain ir	n Remarks)		Frost-Heav	e Hummocks (D7)	
Sparsely Ve	egetated Concave Su	ırface (B8)						
Field Observat	ions:							
Surface Water	Present? Yes	N	o X	Depth (inche	s):	Wetland		
Water Table Pr			o X	Depth (inche		Hydrology	Yes	No X
Saturation Pres	sent? Yes	N		Depth (inche		Present?		
(includes capilla					·			
Describe Reco	orded Data (stream o	gauge, monitori	ıng well, aerial ph	otos, previous	inspections), if	available:		
Remarks:								
	isit on 3/11/2019- No	groundwater or	saturation within 1	6-inches below	ground surface. L	eft test pit open fo	or 30 minutes. No ORZ.	No evidence of prior
ponding. No pug	gged soils.							

Project/Site:	Holley Park Subdivi	ision			City/Count	ty: La Center / 0	Clark		;	Sampling Dat	te: 11/14	/2018
Applicant/Owner	: Compass Group	LLC						State: V			g Point:	
Investigator(s):	Taya MacLean and	Sonya Templeton			Section	, Township, Ra						•
Landform (hillslo	pe, terrace, etc.):	Shoulder Slope				Local relief	(concave	e, convex, no	ne):	None	Slope (%):	<3%
Subregion (LRR)): A, Northwest For	rests and Coast		Lat:		L	.ong:		•	Datu	m:	
Soil Map Unit Na		OdB, Odne silt loam	<u> </u>						NWI clas	ssification:		
•	drologic conditions of			•							lain in Remar	
Are Vegetation	, Soil , Soil	, or i	Hydrology	si	gnilicantiy di aturally nrobl	lematic?				present <i>:</i> ers in Remarl	Yes X	NO
	OF FINDINGS -						-	=	•		•	
ĺ	getation Present?		iap silov		X		אוס, נומ	iiisects, ii	пропа	int icature		
Hydric Soil Pres				_		Is the Sam	pled Are	a				
Wetland Hydrolo						within a We	etland?	Yes		No	Х	
Precipitation: According to the prior Remarks:	AgACIS Battle Gro					day of the site	visit and					weeks
VEGETATIO	NI .											
VEGETATIO	<u>IN</u>		Absolute		Dominant	Indicator	Do	minance Tes	et works	choot:		
Tree Stratum (P	Plot Size: 30' r or)	% Cover		Species?	Status		mber of Dom				
1.	101 0120. 00 1 01		70 00101		<u> </u>	<u>Otatao</u>		at Are OBL, F	•		1	(A)
2.				_			'		7.011, 0			()
3.							Tot	al Number of	f Domina	ant		
4.							Spe	ecies Across	All Strat	a:	2	(B)
		-	0%	= Total	Cover							
	tratum (Plot Size: 1	0' r or)					Per	cent of Domi	inant Sp	ecies		
1.				_			Tha	at Are OBL, F	ACW, o	r FAC:	<u>50%</u>	(A/B)
2. 3.				_			Pre	valence Ind				
				_			OD			Multiply by		•
4. 5.				_			,	L species CW species		x1= x2=	0	
J		 -	00/	- Total	Caver			C species		x	0	
Herb Stratum (P	Plot Size: 5' r or	-	0%	= Total	Covei			CU species	20		246 80	
Agrostis spe			80%		Yes	FAC ?		L species		x 5 =	0	
Hypochaeris			20%	_	Yes	FACU		umn Totals:	102	-	326	(B)
3. Trifolium spe			2%		No	FAC ?	•	Prevalence			3.20	
4.							Нус	drophytic Ve	egetatio	n Indicators		
5.								1 - Rapid Te	est for H	ydrophytic Ve	egetation	
6.								2 - Dominar	nce Test	is >50%		
7.				_				3 - Prevalen	ce Inde	k is ≤3.0 ¹		
8.				_					J		rovide suppo	rting
9.				_			•			or on a sepa	,	
10.				_				•		scular Plants		
Woody Vine Stra	atum (Plot Size: 10'	r or)	102%	= Total	Cover			-		hytic Vegetat and wetland	hydrology mu	ıst
1				_			50	r. 000110.				
2 % Bare Ground i	in Herh Stratum	0%	0%	= Total	Cover			Hydrophyti Vegetation Present?		esN	» <u>х</u>	
Remarks:												

SOIL							Sampling Point: 3		
Profile Description (I	Describe to the	depth need	led to document t	he indicator or cor	nfirm the abse	nce of indicators)	:		
Depth	Matrix			Redox Fe					
	olor (moist)	%	Color (moist)	<u></u> %	Type ¹	Loc ²	Texture	Remarks	
0-16 1	10YR 3/2	100					SiL		
								-	
	 -								
	 -		-					-	
¹ Type: C=Concentration	on, D=Depletion	n, RM=Reduc	ced Matrix CS=Cov	vered or Coated San	d Grains.				
² Location: PL=Pore Li	•								
Hydric Soil Indicators	s (Applicable to	all LRRs, ι	ınless otherwise ı	noted):		Indicators for I	Problematic Hydric So	oils³:	
Histosol (A1)			Sandy Redox ((S5)		2 cm Muck	-		
Histic Epipedon (A	\ 2)	-	Stripped Matrix	•			Material (TF2)		
Black Histic (A3)	,	-		Mineral (F1) (excep	t MLRA 1)		w Dark Surface (TF12)		
Hydrogen Sulfide	(A4)	-	Loamy Gleyed	l Matrix (F2)			ain in Remarks)		
Depleted Below D	ark Surface (A1	1)	Depleted Matri	ix (F3)					
Thick Dark Surfac	e (A12)	-	Redox Dark Su	urface (F6)		3 Indicators of by	vdrophytic vegetation a	nd wotland	
Sandy Mucky Min	eral (S1)	-	Depleted Dark	Surface (F7)		,	be present, unless dist		
Sandy Gleyed Ma	trix (S4)	-	Redox Depres	sions (F8)		problematic.	•		
Restrictive Layer (if p	oresent):								
Type:						Hydric Soil			
Depth (inches):						Present?	Yes	No X	
Remarks:									
HYDROLOGY									
Wetland Hydrology Ir	ndicators:								
Primary Indicators (mir	nimum of one re	quired; chec	k all that apply)	<u> </u>		Secondary India	cators (2 or more require	red)	
Surface Water (A1	1)	-	Water-Stained	Leaves (B9) (excep	t MLRA	Water-Stain	ed Leaves (B9) (MLRA	1, 2,	
High Water Table	(A2)		1, 2, 4A, and	d 4B)		4A, and 4	1 B)		
Saturation (A3)		-	Salt Crust (B1	•			atterns (B10)		
Water Marks (B1)		-	Aquatic Inverte			 ·	Water Table (C2)		
Sediment Deposits	• ,	-	Hydrogen Sulf				/isible on Aerial Image	ry (C9)	
Drift Deposits (B3)	•	-		ospheres along Livir	ng Roots (C3)		Position (D2)		
Algal Mat or Crust		-		educed Iron (C4)		Shallow Aq			
Iron Deposits (B5)		-		eduction in Tilled So	` '	FAC-Neutra			
Surface Soil Crack		(D=)		essed Plants (D1) (L	.RR A)		Mounds (D6) (LRR A)		
Inundation Visible	_	•	Other (Explain	in Remarks)		Frost-Heave	e Hummocks (D7)		
Sparsely Vegetate	ed Concave Sur	face (B8)							
Field Observations:									
Surface Water Presen			No X	Depth (inches):		Wetland			
Water Table Present?			No X	Depth (inches):		Hydrology	Yes	No X	
Saturation Present? (includes capillary fring	Yes_		No X	Depth (inches):	>16	Present?			
(o.aaoo oapiilary illii	3~/								
Describe Recorded I	Data (stream ga	auge, monit	oring well, aerial p	ohotos, previous in	spections), if	available:			
Remarks:	2/44/2040 N	roundata = :	within 16 inches 0	aturation at 4.4 is -t-		d ourfood 1 of tot	nit onen for 20 minutes	No ODZ Na odda	
Follow up site visit on a of prior ponding.	ə/ i i/∠u 19- NO g	nounawater v	within 16-inches. S	aturation at 14-inche	es below groun	u suriace. Lett test	pit open for 30 minutes	5. INO UKZ. INO EVIDEI	

Project/Site: Holley Park Subdivision		City/Count	ty: La Center / Cla	ark	Sampling Date:	11/14/2018
Applicant/Owner: Compass Group LLC			.,. <u></u>	State: WA	Sampling Po	
Investigator(s): Taya MacLean and Sonya Tem	oleton	Section	. Township. Rand	ge: Sect 02, T4N, R3E	Jp3	
Landform (hillslope, terrace, etc.): Shoulder S				oncave, convex, none):	None SI	lope (%): <3
Subregion (LRR): A, Northwest Forests and Co	ast	Lat:	•	ng:		,
Soil Map Unit Name: Unit OdB, Odne si					assification:	
Are climatic / hydrologic conditions on the site ty	pical for this time o	f year?	Υe		(If no, explain	
Are Vegetation, Soil	, or Hydrology	significantly di		re "Normal Circumstances	" present? Y	res X No
Are Vegetation, Soil	, or Hydrology _	naturally probl	lematic? (If	needed, explain any ans	wers in Remarks.)	
SUMMARY OF FINDINGS - Attach s	ite map show	ing sampling p	oint location	s, transects, impor	tant features,	etc.
Hydrophytic Vegetation Present?	Yes X	No	la tha Camani	ad Auga		
Hydric Soil Present?	Yes	No X	Is the Sample			
Wetland Hydrology Present?	Yes	No <u>X</u>	within a Wetl	Yes	No <u>X</u>	
Precipitation: According to the AgACIS Battle Ground station, oprior	0.03 inches of rainf	all was received the	day of the site vi	isit and 1.75 inches of rair	nfall was received for	or the two weeks
Remarks: Plot located in pasture actively grazed by horse.						
VEGETATION						
	Absolute	Dominant	Indicator	Dominance Test wor	ksheet:	-
Tree Stratum (Plot Size: 30' r or)	% Cover	Species?	<u>Status</u>	Number of Dominant S	Species	
1	_			That Are OBL, FACW,	, or FAC:	1 (A)
2.	_					
3.				Total Number of Domi	nant	
4	_			Species Across All Str	ata:	1 (B)
	0%	= Total Cover				
Sapling/Shrub Stratum (Plot Size: 10' r or	_)			Percent of Dominant S	•	/
1.				That Are OBL, FACW,	, 0, 1, 7, 10.	00% (A/B)
2. 3.				Prevalence Index wo Total % Cover of		
-						
5.				OBL species 0 FACW species 0		0
·		- Total Cover		FAC species 10	— , –	
Herb Stratum (Plot Size: 5' r or)	0%:	= Total Cover		FACU species 0	- -	<u>300</u> 0
1. Agrostis species	90%	Yes	FAC ?	UPL species 0		0
Poa species	10%	No	FAC ?	Column Totals: 10		300 (B)
3.	1070	140	TAO :	Prevalence Index	 `' _	3.00
4.	_			Hydrophytic Vegetat		
5.				' ' '	Hydrophytic Vegeta	ation
6.				X 2 - Dominance Te		
7.				X 3 - Prevalence Ind		
8.					Adaptations ¹ (Provi	ide supportina
9.	_			_	s or on a separate	
10.	_			5 - Wetland Non-V	/ascular Plants ¹	,
11.	_				ophytic Vegetation ((Explain) ¹
	100%	= Total Cover		¹ Indicators of hydric so	oil and wetland hyd	rology must
Woody Vine Stratum (Plot Size: 10' r or)				be present.		
1. 2.				Hydrophytic		
<u> </u>	0%	= Total Cover		1.7	Yes X No	
% Bare Ground in Herb Stratum0%				Present?		
Remarks:						

SOIL							Sampling Point:	4		
Profile Descrip	tion (Describe to th	e depth need	ed to document the	indicator or c	onfirm the abse	ence of indicators):			
Depth	Matrix	(Redox F	- eatures					
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks		
0-8	10YR 3/2	98	7.5YR 3/4	2	C	M	SiL			
8-14	10YR 3/2	100					SiL			
								-		
								- <u>-</u>		
· · ·	•		ed Matrix CS=Covere	ed or Coated S	and Grains.					
² Location: PL=P	ore Lining, M=Matrix									
Hydric Soil Indi	cators (Applicable t	o all LRRs, u	nless otherwise no	ted):		Indicators for	Problematic Hydric So	oils³:		
Histosol (A1)		Sandy Redox (S	5)		2 cm Muck	(A10)			
Histic Epipe	don (A2)	_	Stripped Matrix (S6)		Red Parent	Material (TF2)			
Black Histic	(A3)		Loamy Mucky Mi	neral (F1) (exce	ept MLRA 1)	Very Shallo	w Dark Surface (TF12)			
Hydrogen Si	ulfide (A4)		Loamy Gleyed M	atrix (F2)		Other (Exp	lain in Remarks)			
Depleted Be	low Dark Surface (A	11)	Depleted Matrix ((F3)						
Thick Dark S	Surface (A12)		Redox Dark Surf	ace (F6)		3				
Sandy Muck	y Mineral (S1)		Depleted Dark Si	urface (F7)			ydrophytic vegetation a be present, unless dist			
Sandy Gleye	ed Matrix (S4)	_	Redox Depression	ons (F8)		problematic.	be present, amess dist	urbed of		
Restrictive Laye	er (if present):	_								
Тур						Hydric Soil				
Depth (inches)						Present? Yes No X				
Depth (mones)	•					110001111		<u> </u>		
HYDROLOG										
Wetland Hydrol						0 1 1 1		D.		
	s (minimum of one r	equirea; cneck		_		-	cators (2 or more requir			
Surface Wat	* *	_	Water-Stained Le		ept MLRA		ned Leaves (B9) (MLRA	A 1, 2,		
High Water			1, 2, 4A, and 4	B)		4A, and	•			
Saturation (A	•	_	Salt Crust (B11)	. (5.46)			atterns (B10)			
Water Marks	` '	_	Aquatic Invertebr				n Water Table (C2)			
Sediment De		_	Hydrogen Sulfide				Visible on Aerial Image	ry (C9)		
Drift Deposit		_	Oxidized Rhizosp	ū	ving Roots (C3)		c Position (D2)			
Algal Mat or		_	Presence of Red		2 11 (22)	Shallow Aq				
Iron Deposit	•	_	Recent Iron Redu			·	al Test (D5)			
Surface Soil		— (D.7)	Stunted or Stress		(LRR A)	·	Mounds (D6) (LRR A)			
	isible on Aerial Imag	_	Other (Explain in	Remarks)		Frost-Heav	e Hummocks (D7)			
	getated Concave Su	пасе (вв)								
Field Observation										
Surface Water F			No X	Depth (inches		Wetland				
Water Table Pre			No <u>X</u>	Depth (inches	s): >16	Hydrology	Yes	No X		
Saturation Prese (includes capilla		1	No <u>X</u>	Depth (inches	s):>16	Present?				
Describe Recor	ded Data (stream g	jauge, monito	ring well, aerial pho	otos, previous	inspections), if	available:				
Remarks:	it an 0/44/0040 h:			Simple It I	anaunad f	l off toot - it	* 45 00 ****** N 05	OZ Ne ordelene i S. S.		
Follow up site vis		groundwater o	saturation within 16	o-inches below	ground surface.	Lett test pit open fo	r 15-20 minutes. No OF	κ∠. INO evidence of prio		
,	J -									



Appendix C: Streamflow Duration Assessment Forms

Appendix B: Streamflow Duration Field Assessment Form

Proje	ect # / Na	ame	Assessor							
		6962 Holley Park S vy Avenue, La Center, \	Sonya Templeton							
	erway Na	-	Coordinates	at lat.	Date ₁ 45.8610	1/14/2018 40	N			
		aries 60 feet downstrea	downstream	end			W			
			(ddd.mm.ss)		^{g.} -122.66 turbed Sit	e / Difficult				
Prec	ipitation	w/in 48 hours (cm) 0.07	1	Situati	on (Describ	e in "Notes")				
	erved	% of reach w/observed surface flow_70% % of reach w/any flow (surface or hyporheic)								
Hyai	rology	# of pools observed								
	Observed Wetland Plants (and indicator status):			Observed Macroinvertebrates:						
Observations				Taxon		Indicator Ephemer- # of				
	giant horsetail					Status	optera?	Individuals		
rva	(Equisetum telmateia; FACW)			N/A						
pse										
0										
Indicators	1. Are a	quatic macroinvertebrate		☐ Yes	Σ	No				
	2. Are 6	or more individuals of th	sent? Yes X No							
	3. Are p	erennial indicator taxa pr	☐ Yes No							
	4. Are F	ACW, OBL, or SAV plants	th)	X Yes] No				
	5. What	is the slope? (In percent, r	am)	5	%					
Conclusions	If Yes: Are perennial indicator taxa present? (Indicator 3) If No: What is the slope? (Indicator 5) Are aquatic macroinvertebrates present? (Indicator 1) Are aquatic macroinvertebrates present? (Indicator 1)							NT %:		
	If No: Are SAV, FACW, or OBL plants present? (Indicator 4) If No: Are SAV, FACW, or OBL plants present? (Indicator 5) If No: EPHEMERAL Slope < 10.5%: INTERMITTENT Slope > 10.5%: EPHEMERAL									
	Single Indicators: Fish Amphibians					Finding:				

Notes: (explanation of any single indicator conclusions, description of disturbances or modifications that may interfere with indicators, etc.)										
Difficult Situation:	Describe situation. For disturbed streams, note extent, type, and history of disturbance.									
Prolonged Abnormal Rainfall / Snowpack										
☐ Below Average										
Above Average										
☐ Natural or Anthropogenic Disturbance										
Other:										
Additional Notes: (sketch of site, description of photos, comments on hydrological observations, etc.) Attach additional sheets as necessary.										
Channel bed is approximately 4-feet wide with 2-foot tall banks. Approximately 4 inches of continuous flow was present in the entire on-site channel reach during the November 2018 site visit. Substrate in the channel is composed of a silt loam with gravels and cobbles and large wood debris.										
Ancillary Information:										
X Riparian Corridor Alnus rubra, Rubus armeniacus, Athyrium cyclosorum										
☐ Erosion and Deposition										
☐ Floodplain Connectivity										
Observed Amphibians, Snake, and Fish:										
	Observed Ampinibians, Snake, an	Life History	Location	Number of Individuals						
	Таха	Stage	Observed	Observed						

Appendix B: Streamflow Duration Field Assessment Form

Project # / Name 6962 Holley Park Subdivision					Assessor Sonya Templeton				
Address NE Ivy Avenue, La Center, Washington					1 3	ouiya 16	•	11/18/2018	
		me Water 2	Coordinates a				N		
	ch Bound		from study are	ea boudary	downstream (ddd.mm.ss)	end Long	<u>5</u> .		W
Prec	ipitation	w/in 48 hours (cm) 0.076		el Width (m) 2		ı —		ite / Difficult	
				Situati	on (besch	be in "Notes")			
% of reach w/observed surface flow_20									
0bs	erved	% of reach w/any flow (surface or hyporheic)							
Hyd	rology	, , ,	3	, <u></u>	_				
		# of pools observed							
				Macroinvertebrates:					
S	(and me	nd indicator status):				dicator	Ephemer- optera?	# of Individuals	
Observations	giant horsetail			Status optera? Individuals N/A					
ıva	(⊏	(Equisetum telmateia; FACW)							
) Sq(
0									
S		quatic macroinvertebrate				Yes		⊠ No	
ator		or more individuals of th			sent?	Yes		⊠ No	
Indicators		erennial indicator taxa pr				Yes		X No □	
_ u		ACW, OBL, or SAV plants				Yes 10	0/	☐ No	
	5. What	is the slope? (In percent, r	neasured for the va	lley, not the strea	am)		%		
				If Yes: Are	If Yes:				
		072	perennial indicator taxa present?		<u> </u>	Slope < 16			
		If Yes individe	(Indicator 3)	If No: What is slope?	the	INTERMITT			
		Epi	(Indicator §		Slope ≥ 1 PERENN				
ons		Are aquatic macroinvertebrates present? (Indicator 1) Slope < 10.5%:							
Conclusions									
nc		If No: A	ne INTERMITTENT						
ၓ	or OBL plants present3 (Indicator 5) Slope ≥ 10.5%: EPHEMERAL								
				If No: EPHEMERAL					
	Cinala	Indiantors		Finding	: □E	pheme	ral		
	Fish			Intermittent					
	Amp	hibians				P	erennia	al	

Notes: (explanation of any single indicator cointerfere with indicators, etc.)	onclusions, description of disturbar	nces or mo	difications tl	hat may					
Difficult Situation:	Describe situation. For distuant and history of disturbance.	urbed strea	ams, note ex	tent, type,					
☐ Prolonged Abnormal Rainfall / Snowpack									
☐ Below Average									
Above Average									
☐ Natural or Anthropogenic Disturbance									
☐ Other:									
Additional Notes: (sketch of site, description additional sheets as necessary. channel bed is approximately 8-5 f present during the site visit. Substitution	feet wide and had approximately 2	2 inches o	f water with						
Ancillary Information:									
Riparian Corridor Alnus rubra, Rubus ar	meniacus, Athyrium cyclosorum,	Urtica dio	ica						
☐ Erosion and Deposition									
☐ Floodplain Connectivity									
r	Observed Amphibians, Snake, and	d Fish:							
	Taxa	Life History Stage	Location Observed	Number of Individuals Observed					

Appendix B: Streamflow Duration Field Assessment Form

Project # / Name 6962 Holley Park Subdivision					Assessor Sonya Templeton					
Address NE Ivy Avenue, La Center, Washington					1 301	.yu 1011	i 	1/14/2018		
	erway Na		Coordinates at		45.8610		N			
Read	h Bound	aries Headwaters		downstream ei (ddd.mm.ss)	nd Long	^{§.} -122.66	50153	W		
Prec	initation	w/in 48 hours (cm) 0.07		☐ Dist	turbed Sit	e / Difficult				
	.,0.10.1.	I., 10	02 016	l Width (m)	1	Situation	on (Describ	e in "Notes")		
		% of reach w/observed	surface flow_70	<u>%</u>						
Oho	ow.od		70%							
	erved rology	% of reach w/any flow (surface or hypor	heic)	_					
		# of pools observed								
	Ohserv	ed Wetland Plants		Observed N	Macroinvertebra	ates:				
		dicator status):								
ns			Ta		Indicator Ephemer- # of Status optera? Individuals					
Observations										
erva					N/	А				
SqC										
'n	1. Are a	quatic macroinvertebrate	es present?			☐ Yes	Σ	No		
tor	2. Are 6	or more individuals of th	e Order Epheme	eroptera pres	sent?	☐ Yes	Σ	X No		
ndicators		perennial indicator taxa present? (refer to Table 1)			Yes No					
luc	4. Are F	ACW, OBL, or SAV plants present? (Within ½ channel width			th)	Yes		☐ No		
	5. What	is the slope? (In percent, r	neasured for the val	ley, not the stre	y, not the stream)					
				If Yes: Are perennial indicator	If Yes: PERENNIAL					
		If Yes individ	: Are 6 or more uals of the Order	taxa present? (Indicator 3) If No: What is the slope?						
6	1	Epi	nemeroptera present? ndicator 2)	If No:	(Indicator 5)		Slope ≥ 169 PERENNIA			
ions		macroinvertebrates present? (Indicator 1)		,						
Conclusions	ļ		the Slope < 10.5%: INTERMITTENT							
Con		If No: A or OBL	(Indicator 5)	ppe? cator 5) Slope ≥ 10.5%: EPHEMERAL						
	Single I	Indicators:			Finding:	_	phemer			
	Fish									
	/ip	- III AIGITO					erenniai	I		

Notes: (explanation of any single indicator c interfere with indicators, etc.)	onclusions, description of disturbar	nces or mo	difications t	hat may					
Difficult Situation:	Describe situation. For dist and history of disturbance.	urbed strea	ams, note ex	rtent, type,					
Prolonged Abnormal Rainfall / Snowpack	•								
☐ Below Average									
Above Average									
☐ Natural or Anthropogenic Disturbance									
☐ Other:									
Additional Notes: (sketch of site, description additional sheets as necessary.	n of photos, comments on hydrolog	ical observ	ations, etc.)	Attach					
Channel bed is approximately 4-feet wide with 1-foot tall banks. Approximately 0.25 inches of continuous flow was present in the on-site portion of the channel during the November 2018 site visit. Bed substrate is composed of silt loam. Determined intermittent because at same elevation as Water 2 though no evidence of FACW or OBL veg growing adjacent to stream channel in study area.									
Ancillary Information:									
🖄 Riparian Corridor Alnus rubra, Rubus a	rmeniacus, Athyrium cyclosorum								
☐ Erosion and Deposition									
☐ Floodplain Connectivity									
Observed Amphibians, Snake, and Fish:									
	Taxa	Life History Stage	Location Observed	Number of Individuals Observed					
	Тили	Stage	3,501,40u	0.5501700					



Appendix D: Representative Site Photographs



Photo A. View facing north up NE Ivy Avenue. Photo taken by AKS survey crew on 11/28/18.



Photo C. View southeast of gravel driveways and residential house. Photo taken by AKS survey crew on 11/28/18.



Photo B. View facing east of Water 1 from NE Ivy Avenue.



Photo D. View facing north of upland area surrounding barn. Photo taken by AKS survey crew on 11/28/18.





Photo E. View facing northwest of Water 1 riparian corridor. Photo taken by AKS survey crew on 11/28/18.



Photo G. View facing east of Water 1. Water flows west. Photo taken by AKS survey crew on 12/02/18.



Photo F. View facing east of Water 1 riparian corridor. Photo taken by AKS survey crew on 11/28/18.



Photo H. View facing northeast of rip-rap lined swale off-site where Water 1 originates. Photo taken by AKS survey crew on 12/02/2018.



Photo I. View facing southwest of open field.



Photo K. View north of open field toward Water 1.



Photo J. View south of open field looking toward Water 3.



Photo L. View north within open area between Water 2 and Water 3.





Photo M. View facing southeast of Water 3 corridor. Photo taken by AKS survey crew on 11/20/18.



Photo O. View facing south of Water 2. No wetlands found above the OHWM



Photo N. View south of Water 2 corridor. Photo taken by AKS survey crew on 11/20/18.



Photo P. View east of forested area with Oregon white oaks near Water 3. Photo taken by AKS survey crew on 11/20/18.





Photo Q. View facing east along edge of Oregon white oak forested habitat. Photo taken by AKS survey crew on 11/29/18.



Photo OS View northwest of horse pasture area. Photo taken by AKS survey crew on 11/29/18.



Photo R. View facing west along edge of Oregon white oak forested habitat. Photo taken by AKS survey crew on 11/29/18.



Photo T. View southeast of horse pasture area toward Water 2 and Oregon white oak habitat area. Photo taken by AKS survey crew on 11/29/18.



Appendix E: Riparian Buffer Enhancement Planting Specifications

Holley Park Subdivision Riparian Habitat Buffer Enhancement Planting Specification

Riparian Buffer Enhancement Planting Area (adjacent Water 1) = 22,037 SF (0.51 AC)

	,		<u> </u>		
Common Name	Scientific Name	Facultative Class	Spacing (feet; triangular pattern)	Size	Quantity
Douglas fir (tree)	Pseudotsuga menziesii	FACU	12′	1 gallon or bare root	51
bigleaf maple (tree)	Acer macrophyllum	FACU	12'	1 gallon or bare root	51
vine maple (tree)	Acer circinatum	FAC	12′	1 gallon or bare root	51
baldhip rose (shrub)	Rosa gynmocarpa	FACU	6'	1 gallon or bare root	102
common snowberry (shrub)	Symphoricarpos albus	FACU	6'	1 gallon or bare root	102
Lewis' mock orange (shrub)	Philadelphus lewisii	NOL	6'	1 gallon or bare root	102
oceanspray (shrub)	Holodiscus discolor	FACU	6'	1 gallon or bare root	102
serviceberry (shrub)	Amelanchier alnifolia	FACU	6′	1 gallon or bare root	102
tall Oregon grape (shrub)	Mahonia aquifolium	FACU	6′	1 gallon or bare root	102
				TOTAL:	765

^{*}Any areas left bare should be seeded using an appropriate native upland grass seed mix.

Temporary Riparian Buffer Impact Restoration Planting Area (Adjacent Water 2) = 1,475 SF (0.03 AC)

Common Name	Scientific Name	Facultative Class	Spacing (feet; triangular pattern)	Size	Quantity
common snowberry	Symphoricarpos albus	FACU	6'	1 gallon or bare	10
(shrub)				root	
oceanspray (shrub)	Holodiscus discolor	FACU	6′	1 gallon or bare	10
				root	
serviceberry (shrub)	Amelanchier alnifolia	FACU	6'	1 gallon or bare	10
				root	
tall Oregon grape	Mahonia aquifolium	FACU	6'	1 gallon or bare	10
(shrub)				root	
	•	•	•	TOTAL:	40

^{*}Any areas left bare should be seeded using an appropriate native upland grass seed mix.

Planting Notes

- 1) Plantings should preferably be installed between February 1 and May 1 for bare roots and seeds and between October 1 and November 15 for containers. Plants may be installed at other times of the year; however, additional measures may be necessary to ensure plant survival. Bare root plants must be installed during the late winter/early spring dormancy period.
- 2) All non-native invasive vegetation (except for existing pasture grasses) shall be removed from planting areas prior to installing native enhancement plantings.
- 3) Temporary irrigation may be necessary for the survival of the enhancement plantings. Irrigation is recommended during the first two years as the plants become established. Watering shall be provided at a rate of at least one inch per week between June 15 and October 15 or as needed.
- 4) Plantings shall be mulched a minimum of three inches in depth and 18 inches in diameter to retain moisture and discourage weed growth around newly installed plant material.
- 5) Depending on nursery stock availability, appropriate plant substitutions must be approved by a qualified professional with expertise in wetland and habitat mitigation.