



Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance

9505 19th Avenue S.E.
Suite 106
Everett, Washington 98208
(425) 337-3174
Fax (425) 337-3045

CRITICAL AREA STUDY

FOR

**Four Season Homes, LLC – 4634 E Mercer Way SFR
City of Mercer Island, WA**

Wetland Resources, Inc. Project #17067

Prepared By

Wetland Resources, Inc.
9505 19th Avenue SE, Suite 106
Everett, WA 98208
(425) 337-3174

Prepared For

Four Season Homes, LLC
11319 24th Street East
Edgewood, WA 98372

First Submittal: July 3, 2018
Revision 1: October 1, 2018

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Executive Summary

Project Name: Four Season Homes, LLC – 4634 E Mercer Way SFR

Location: The subject property is located at 4634 E Mercer Way, in the city of Mercer Island.

Client:

Four Season Homes, LLC
11319 24th Street East
Edgewood, WA 98372

Property Owner:

Same as client

Wetland Resources Staff: John Laufenberg, PWS (Principal Ecologist) and Niels Pedersen (Senior Ecologist).

Critical Areas Determination: Regulated features located within the project area (subject property and stormwater easement) include Lake Washington and a City-mapped Type 3 watercourse (Stream A) located along the south property line. Lake Washington requires a 25-foot structure setback (measured from elevation 18.6' NAVD 88). Stream A requires a 35-foot protective buffer.

A portion of the project occurs within the regulated shorelands area (200 feet from the ordinary high water mark of Lake Washington). No wetlands were observed in the vicinity of proposed development.

Proposed Project: The applicant proposes to construct a single-family residence on an undeveloped parcel. The project requires clearing, excavating, and grading to prepare the site. The proposal includes an ABS stormwater pipe laid on the ground surface within the stormwater easement, which discharges to an outfall pad approximately ten feet from the OHWM of Lake Washington.

Critical Areas Impacts and Mitigation: The proposed single-family residence is located outside of the 35-foot buffer associated with Stream A. Proposed development within 35 feet of the watercourse includes an ABS pipe laid on the ground surface, which conveys stormwater generated within the subject property towards Lake Washington. The pipe discharges to a 3' x 8' outfall pad that will be installed as an erosion control measure.

The existing condition of the stormwater easement is maintained lawn or English ivy. The stormwater pipe will be elevated where it crosses the Stream A, to avoid flow alterations. No native vegetation will be removed or impacted as a result of this proposal. Any critical area buffer impacts resulting from this project are considered trivial or discountable; no mitigation is proposed.

1.0 PROPOSED PROJECT

1.1 PROJECT LOCATION

Basin: Puget Sound

Sub-Basin: Water Resource Inventory Area (WRIA) 8 – Cedar/Sammamish River

Watershed: Lake Washington

Sub-Watershed: Mercer Island

The proposed project occurs within the parcel located at 4634 E Mercer Way, in the city of Mercer Island, Washington. *Wetland Resources, Inc.* (WRI) performed multiple site investigations in the spring of 2017 and the summer of 2018. The purpose of the site visits was to identify critical areas on and in proximity to the project.

Access to the site is from the west via E Mercer Way. Vegetation within the subject property consists of typical Puget Lowlands second-growth forest species, with the exception of English ivy in the understory. Topography within the subject property slopes to the south towards a shallow ravine, and east towards Lake Washington. A seasonal stream (Stream A) forms in the shallow ravine in the southern portion of the property, flowing east towards Lake Washington.

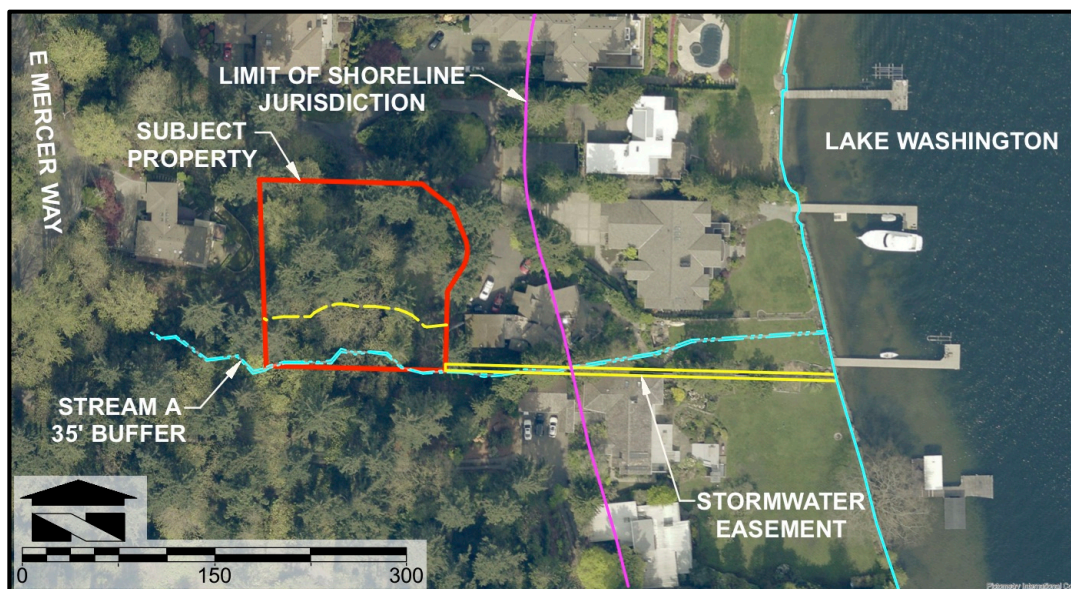


Figure 1: Vicinity Map (image source: King County)

1.2 PROJECT DESCRIPTION

The applicant proposes to construct a new single-family residence within an undeveloped parcel. The residence will be constructed outside of the 35-foot buffer associated with Stream A. Development within 35 feet of the watercourse includes an ABS stormwater pipe that will be placed on the ground surface. The pipe enters the 35-foot buffer in the southeast portion of the site, and is routed to an existing stormwater easement within the adjacent property to the east (at the southeast corner of the subject property). The pipe will then be routed to the east towards Lake Washington. The pipe crosses Stream A approximately 200 feet from the ordinary high water mark (OHWM) of Lake Washington. Metal collars will anchor the pipe to the ground surface in several locations, and the pipe will be elevated where it crosses Stream A (to avoid flow alterations). The pipe has been located to avoid impacts to native vegetation; the pipe will rest on either English

ivy or maintained lawn. The pipe will be installed by hand at grade, will not require impacts to native vegetation, and will not have any measurable effect on critical area functions. The outfall pad is a 3'x8' grouted rock splash pad, and was designed to eliminate erosion potential. The pad will be constructed within an existing grass lawn.

The applicant asserts that the proposed development in the buffer of Stream A will not negatively impact critical area functions due to the small footprint at grade, the existing vegetated condition of the site (aggressive non-native vegetation or maintained lawn), and the design of the outfall pad to eliminate erosion concerns. No compensatory mitigation is proposed for this project.

2.0 REGULATORY SETTING

2.1 SHORELINE SUBSTANTIAL DEVELOPMENT PERMIT EXEMPTION DISCUSSION

A portion of the stormwater easement is located within 200 feet of the OHWM of Lake Washington, and is therefore within shoreline jurisdiction. The shoreline environment designation is Urban Residential (source: Appendix F Mercer Island Shoreline Master Program). The stormwater plan/conveyance is correctly classified as a normal appurtenance to the development of a single-family residence, as defined by the Washington Administrative Code (WAC). The plan/conveyance would also be correctly classified as an accessory use, as defined by the Mercer Island Municipal Code (MICC). Based on these classifications, the proposed development is exempt from shoreline substantial development permit requirements. More detailed discussion is provided below.

2.1.1 WAC Shoreline Exemption Discussion

WAC 173-27-040 provides narrowly construed exemption criteria for shoreline substantial development permits. WAC 173-27-040(2)(g) specifically relates to this project, and reads as follows:

Construction on shorelands by an owner, lessee or contract purchaser of a single-family residence for their own use or for the use of their family, which residence does not exceed a height of thirty-five feet above average grade level and which meets all the requirements of the state agency or local government having jurisdiction thereof, other than requirements imposed pursuant to chapter 90.58 RCW. "Single-family residence" means a detached dwelling designed for and occupied by one family including those structures and developments within a contiguous ownership which are a normal appurtenance. An "appurtenance" is necessarily connected to the use and enjoyment of a single-family residence and is located landward of the ordinary high water mark and the perimeter of a wetland. On a statewide basis, normal appurtenances include a garage; deck; driveway; utilities; fences; installation of a septic tank and drainfield and grading which does not exceed two hundred fifty cubic yards and which does not involve placement or fill in any wetland or waterward of the ordinary high water mark. Local circumstances may dictate additional interpretations of normal appurtenances which shall be set forth and regulated within the applicable master program. Construction authorized under this exemption shall be located landward of the ordinary high water mark;

The applicant asserts that the proposed single-family residence meets all exemption criteria provided in WAC 173-27-040(2)(g), specifically:

- height above grade (less than thirty-five feet),
- local jurisdiction requirements (MICC exemption criteria),
- the definition of single-family residence (detached dwelling for use by one family),
- contiguous ownership (parcel and stormwater easement only),

- location relative to the OHWM (landward) and wetlands (outside the perimeter),
- the definition of normal appurtenance (including utilities), and
- the absence of fill placement in wetlands or waterward of the OHWM.

2.1.2 MICC Shoreline Exemption Discussion

Pursuant to MICC 19.07.110(D) *Table A*, Single-family dwellings, including accessory uses and structures are considered categorically exempt development activities. Accessory uses are defined by the MICC as “a use customarily incidental and accessory to the principal use of the site...” It is the applicant’s assertion that stormwater conveyance is correctly classified as an accessory use, and is therefore covered under the single-family residential exemption provisions of the MICC.

2.2 MICC CRITICAL AREAS COMPLIANCE

New utility facilities are an allowed alteration within critical area buffers if they meet the standards set forth in MICC 19.07.030(a)-(d). The following narrative re-states all subsections of MICC 19.07.030 (bold text, indented), with the applicant’s response to each citation immediately following (normal font, justified).

a. Construction is consistent with best management practices,

Response: BMPs are proposed as part of the TESC Plan prepared for this project.

b. The facility is designed and located to mitigate impacts to critical areas consistent with best available science,

Response: Mitigation is defined in the MICC as the use of any or all of the following actions: avoiding the impact, minimizing the impact, rectifying the impact, eliminating the impact over time, compensating for the impact, and monitoring the impact. The proposed project includes placement of an ABS pipe on the ground surface to convey stormwater. The proposed project meets the mitigation sequencing provisions of the MICC, as described below.

Avoidance

The only way to avoid project impacts completely is to discharge outside of the watercourse buffer. This option was explored early on in the development process, and was ultimately deemed infeasible for two reasons: the downstream area below the buffer’s edge is a steep slope; discharging to the slope could reduce slope stability, and additional stormwater inputs to Stream A could exacerbate existing drainage issues within the neighboring property.

Minimization

The standard practice for installing this pipe is trenching. Impacts have been minimized by placing the pipe on the ground surface.

Rectification/Elimination

The proposal eliminates impacts over time because cleaning/flushing the pipe can be accomplished without any disturbance to the critical area buffer.

Compensation/Monitoring

As stated in this report, critical areas impacts are extremely limited. Compensation is not appropriate in this case.

c. Impacts to critical areas are mitigated to the greatest extent reasonably feasible so there is no net loss of critical area functions; and

Response: As described in this report, placement of an ABS pipe on the ground surface within the buffer of Stream A (in maintained lawn and over aggressive non-native English ivy) does not impact critical areas. No net loss of critical area functions is expected, and therefore no mitigation is required.

The code official may require a critical area study or restoration plan for this allowed alteration.

Response: Noted.

3.0 DELINEATION METHODOLOGY

3.1 LIMIT OF STUDY

The proposed project occurs within one 0.49-acre parcel and a five-foot wide stormwater easement on the adjacent parcel to the east (4640 E Mercer Way). Lack of legal access to additional parcels in the vicinity of the subject property prevents Wetland Resources, Inc. (WRI) staff from performing routine wetland/OHWM determinations in surrounding areas. Critical area boundaries depicted outside of the accessible parcels are estimated using best professional judgment, and are based on visual observation from the edge of legal access.

3.2 CRITICAL AREAS CLASSIFICATION

Critical areas were classified in accordance with the standards set forth in MICC 19.07.070 for watercourses, section 19.07.080 for wetlands, 19.07.090 for wildlife habitat conservation areas, and 19.07.110 for shoreline areas. Identification of geologic hazard areas is beyond the scope of this report. Buffers are measured horizontally in a landward direction from the critical area boundary.

3.3 WETLAND DETERMINATION AND DELINEATION

Wetland boundaries were determined using the routine determination approach described in 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) (U.S. Army Corps of Engineers 2010), as required by MICC 19.07.080(A). Under the routine methodology, the process for making a wetland determination is based on three steps:

- 1.) Examination of the site for hydrophytic vegetation (species present and percent cover);
- 2.) Examination of the site for hydric soils;
- 3.) Determining the presence of wetland hydrology

The following criteria must be met in order to make a positive wetland determination.

3.3.1 Vegetation Criteria

The Corps Manual and 2010 Regional Supplement define hydrophytic vegetation as “*the assemblage of macrophytes that occurs in areas where inundation or soil saturation is either permanent or of sufficient frequency and duration to influence plant occurrence.*” Field indicators are used to determine whether the hydrophytic vegetation criteria have been met. Examples of these indicators include, but are not limited to, the rapid test for hydrophytic vegetation, a dominance test result of greater than 50%, and/or a prevalence index score less than or equal to 3.0.

3.3.2 Soils Criteria

The 2010 Regional Supplement (per the National Technical Committee for Hydric Soils) defines hydric soils as soils “*that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part.*” Field indicators are used to determine whether a given soil meets the definition for hydric soils. Indicators are numerous and include, but are not limited to, presence of a histosol or histic epipedon, a sandy gleyed matrix, depleted matrix, and redoximorphic depressions.

3.3.3 Hydrology Criteria

Wetland hydrology encompasses all hydrologic characteristics of areas that are periodically inundated or have soils saturated to the surface for a sufficient duration during the growing season. Areas with evident characteristics of wetland hydrology are those where the presence of water has an overriding influence on the characteristics of vegetation and soils due to anaerobic and chemically reducing conditions, respectively. The strongest indicators include the presence of surface water, a high water table, and/or soil saturation within at least 12 inches of the soil surface.

3.4 WETLAND DETERMINATION DISCUSSION

No wetlands were observed within or in the vicinity of the subject property during any of the site visits.

3.5 WATERCOURSE DETERMINATION

The OHWM of Stream A was determined based on the Ecology guidance document titled *Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State*. Stream boundaries in off-site areas were estimated using a high-resolution aerial overlaid with fine-scale elevation contours generated from a 3x3 Digital Elevation Model of King County. On-site stream boundaries were delineated and surveyed by APS Survey and Mapping.

3.6 WATERCOURSE DETERMINATION DISCUSSION

City of Mercer Island GIS depicts one watercourse to the north of the subject property, and one to the south. The depicted alignment of the north channel meanders across the existing access road (labeled 4600 Block on Google Maps). WRI staff walked the entire length of the access road in search of evidence of a stream channel, or evidence of subsurface drainage (potential piped watercourse). No drains, catch basins, or manhole covers were observed. No surface channels were observed. It is apparent that the mapped watercourse to the north of the subject property is not present in the location depicted on the City of Mercer Island map.

Along the south property boundary, Stream A was first identified in 2017 during a routine field investigation. Narrow, braided scour marks were observed in a dense mat of English ivy at the low point of a shallow ravine within the subject property. These indicators of surface water are consistent with the definition of “Stream” presented in the Mercer Island City Code (MICC).

3.7 WILDLIFE HABITAT CONSERVATION DISCUSSION

Areas used by bald eagles for nesting, breeding, feeding and survival are designated by the City of Mercer Island as wildlife habitat conservation areas. No known bald eagle nests are located in the vicinity of the subject property.

4.0 WETLAND AND STREAM DELINEATION REPORT

WRI was contracted by Four Season Homes to delineate and catalogue regulated features within and in the vicinity of the subject property. No wetlands were observed in the study area. Two regulated features were observed: Lake Washington and a Type 3 watercourse (Stream A). These features are depicted in the attached critical area study map (See Appendix A). Lake Washington is a shoreline of statewide significance, and requires a 25-foot structure setback from the OHWM (survey-based, 18.6' NAVD 88). Stream A is a seasonal stream with faint indicators of bed and bank. The stream does not meet criteria for regulation as a fish-bearing stream using either WAC stream typing criteria (222-16-030), or standards established in section 19.07.070(A) of the MICC; Slope analysis based on LIDAR indicates that stream gradient exceeds 20 percent slope in the lower reaches. Stream A requires a 35-foot protective buffer.

4.1 REVIEW OF EXISTING INFORMATION

Prior to conducting the on-site investigations, public resources information was reviewed to gather background information on the project study area and surrounding areas in regards to wetlands, streams, and other critical areas.

4.1.1 USFWS National Wetlands Inventory

No wetlands are depicted in the vicinity of the project area.

4.1.2 King County Soils

The Natural Resources Conservation Service (NRCS) web soil survey and the 2014 national hydric soil list by state were used to identify soil types in the project area, and state their hydric properties. Kitsap silt loam is the only mapped soil type in the project area. The following table describes the hydric component percentage found in the mapped soil type. The likelihood that a given map unit is a hydric soil is partly based on the percentage of hydric components found in the soil type.

Map Unit Name	Hydric Component	Component Percentage
Kitsap silt loam	Bellingham	3
	Tukwila	1
	Seattle	1

Table 1: Mapped Soils in the Project Area

4.1.3 Fish Presence

The Washington Department of Fish and Wildlife (WDFW), Pacific States Marine Fisheries Commission (PSMFC), and the Washington Dept. of Natural Resources (WADNR) are the primary agencies that provide publicly available information used for making fish presence determinations consistent with the water typing rules set forth in WAC 222-16-030. The following information represents the findings from each source.

4.1.4 WDFW SalmonScape Map Tool

SalmonScape is an online GIS database that contains publicly available resource information for fish population studies and general species distribution (both documented and modeled presence). SalmonScape does not depict stream A. Within Lake Washington, the following species are depicted:

- fall chinook (documented presence),
- coho salmon (documented presence),
- winter steelhead trout (documented presence),
- sockeye salmon (documented presence),
- bull trout (documented rearing),
- kokanee salmon (documented presence),

4.1.5 PSMFC StreamNet Map Tool

StreamNet is a fish distribution database maintained by the PSMFC as a regional clearinghouse for fish data. In the vicinity of the project area, fish presence is only depicted within Lake Washington. StreamNet states the presence of the following species:

- fall chinook (migration only)
- summer chinook (spawning and rearing)
- coho salmon (migration only)
- chum salmon (migration only)
- pink salmon (migration only)
- sockeye salmon (migration only)
- summer steelhead trout (migration only)
- winter steelhead trout (migration only)
- bull trout (migration only)

4.1.6 WDNR Forest Practices Activity Mapping Tool (FPAMT)

FPAMT is an online GIS database that aids the process of submitting a Forest Practices Permit application. The tool is useful for the purposes of this study because WADNR models fish presence. Stream A is not depicted by FPAMT. FPAMT states that the following species are known to occur within Lake Washington:

- fall chinook (migration)
- coho (migration only)
- sockeye salmon (migration only)
- winter steelhead (migration only)
- bull trout (rearing and migration)

4.1.7 City of Mercer Island Critical Areas

In the vicinity of the project area, the City of Mercer Island depicts two watercourses.

4.1.8 WDFW Priority Habitat and Species (PHS) Maps

WDFW PHS maps do not depict any priority habitat or species presence in the vicinity of the subject property.

4.2 WATERCOURSE DETERMINATION FINDINGS

4.2.1 Lake Washington

Jurisdiction: USACE, City of Mercer Island, WDFW, Ecology, DNR

Cowardin Class: Lacustrine, Limnetic, Unconsolidated Bottom

Classification: Shoreline of Statewide Significance

City of Mercer Island Setback Requirement: 25 feet

Lake Washington is a 21,600-acre waterbody that drains much of WRIA 8. Waterbodies that exceed 1,000 acres in total size are recognized as shorelines of statewide significance (WAC 173-20). The area extending 200 feet from the ordinary high water mark of Lake Washington is considered the shoreland area, and development within this zone is subject to the provisions of the Mercer Island Shoreline Master Program (MICC 17.09.110). In Mercer Island, Lake Washington requires a 25-foot structure setback, measured from elevation 18.6' (NAVD 88).

Lake Washington provides habitat for many aquatic species, including: bull trout, pink salmon, sockeye salmon, summer steelhead, winter steelhead, chum salmon, coho salmon, fall Chinook, and summer Chinook. Lake Washington is a primary association area for federally listed threatened and endangered species (chinook, bull trout).

4.2.2 Stream A

Jurisdiction: City of Mercer Island

Cowardin Class: Riverine, Intermittent, Streambed

Watercourse Type (MICC): 3

City of Mercer Island Standard Buffer Requirement: 35 feet

Stream A is a series of faint, braided scour marks found amongst a dense mat of English ivy within the subject property. The feature is located at the low point of a shallow ravine that slopes east towards Lake Washington. Surface water was not observed during any site visit, which indicates that the feature only flows during large precipitation events. Stream A exits the subject property at the southeast corner, flowing east into the adjacent property (4640 E Mercer Way). The stream was observed from within the subject property, and from the edge of legal access within the adjacent property to the east (within an existing five-foot wide stormwater easement).

Based on comparison with the King County Digital Elevation Model (DEM), it appears that the historic channel may travel through approximately the center of the adjacent property (4640 E Mercer Way). However, no evidence of a defined bed or bank was observed within the neighbor's property; the center of the property is a regularly maintained lawn.

Stream A is correctly classified as a Type 3 Watercourse, based on the definitions presented in MICC 19.07.070(A). Type 3 Watercourses have intermittent or seasonal flow, and are not used by fish. The MICC defines "fish use" as follows:

Those areas within a watercourse where live fish normally exist for spawning rearing and/or migration. "Fish use" may be presumed to occur in those reaches of watercourses that have year round flow, are accessible from Lake Washington to juvenile salmonid fish and have an average bed slope of less than 12 percent. "Fish use" shall not be presumed for (1) intermittent or seasonal reaches; (2) for reaches with an average bed slope of 12 percent or greater; (3) for reaches upstream from road culverts with a bottom slope of 10 percent or greater; or (4) reaches with greater than a 12-inch drop from the downstream invert of the culvert to the downstream pool elevation at ordinary high water. If the uppermost point of fish use cannot be identified with simple,

nontechnical observations, then the upper extent of fish use should be determined using the best professional judgment of a qualified professional after considering actual conditions and the physical abilities and capabilities of juvenile salmonid fish.

Fish use is presumed for watercourses that have year round flow, are accessible from Lake Washington, and have an average bed slope of less than 12 percent. Although Stream A is occasionally accessible from Lake Washington, it does not have year round flow, and average bed slope exceeds 12 percent for all reaches outside of 120 feet from Lake Washington. Stream A flows during heavy rain events, through a maintained lawn with no defined bed and bank, and likely spills over the existing bulkhead (within the property located at 4640 E Mercer Way). It is improbable to assert that fish would use this watercourse for any part of their life history requirements. There is no uppermost point of fish use based on simple, nontechnical observations. Stream A is correctly classified as a Type 3 Watercourse.

To further substantiate the non-fish determination, a slope analysis was performed using the King County DEM. This analysis indicates that stream gradient exceeds 20 percent for 92 linear feet in areas downstream of the subject property. See Figure 2 below.

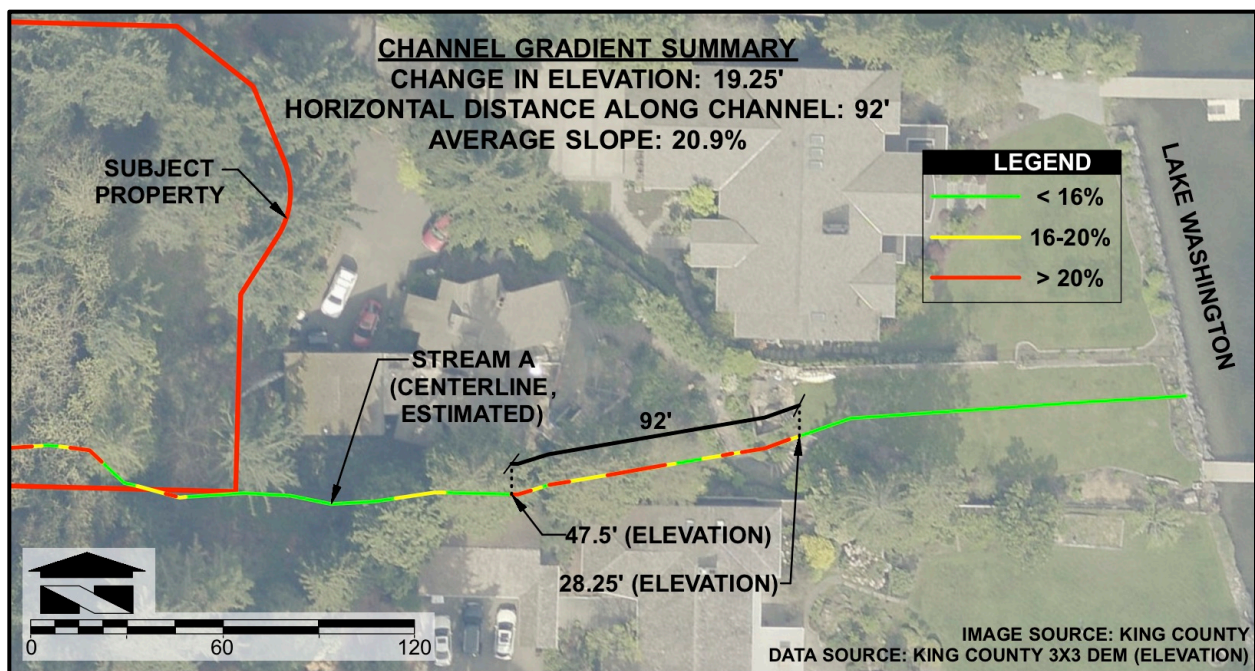


Figure 2: Potential Fish Use

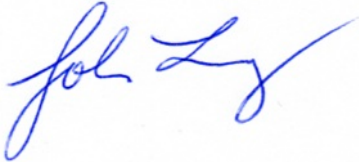
5.0 USE OF THIS REPORT

This Critical Area Study is supplied to Four Seasons Homes, LLC as a means of determining critical area conditions, as required by the City of Mercer Island during the permitting process. This report is based largely on readily observable conditions and, to a lesser extent, on readily ascertainable conditions. No attempt has been made to determine hidden or concealed conditions.

The laws applicable to wetlands are subject to varying interpretations and may be changed at any time by the courts or legislative bodies. This report is intended to provide information deemed relevant in the applicant's attempt to comply with the laws now in effect.

The work for this report has conformed to the standard of care employed by wetland ecologists. No other representation or warranty is made concerning the work or this report and any implied representation or warranty is disclaimed.

Wetland Resources, Inc.



John Laufenberg
Principal Ecologist, PWS #1742

Wetland Resources, Inc.



Niels Pedersen
Senior Ecologist

6.0 REFERENCES

- Brinson, M.M. 1993. A Hydrogeomorphic Classification for Wetlands. Technical Report WRPDE-4. US Army Engineers Waterways Experiment Station, Vicksburg, MS.
- Cowardin, L.M., V. Carter, F.C. Golet and E.T. Laroe. 1979. Classification of Wetlands and Deep Water Habitats of the United States. U.S. Fish and Wildlife Service. FWS/OBS 79/31.
- Environmental Laboratory. 1987. Corps of Engineers Wetland Delineation Manual. Technical Report Y-87-1. Environmental Laboratory, Department of the Army, Corps Waterways Experiment Station, Vicksburg, MS.
- Hruby, T. 2014. Washington State Wetland Rating System for Western Washington: 2014 Update. Washington State Dept. of Ecology Publication No. 14-06-029. Olympia, WA.
- Lichvar, R.W, D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. The National Wetland Plant List: 2016 wetland ratings. Phytoneuron 2016-30: 1–17. Published April 28, 2016. ISSN 2153 733X.
- Munsell Color. 2012. Munsell® Soil Color Book. Munsell Color, Grand Rapids, MI.
- NOAA National Weather Service Forecast Office, Seattle, Washington.
<<http://www.weather.gov/climate/index.php?wfo=sew>>.
- Olson, P. and E. Stockdale. 2010. Determining the Ordinary High Water Mark on Streams in Washington State. Second Review Draft. Washington State Department of Ecology, Shorelands and Environmental Assistance Program. Lacey, WA. Ecology Publication # 08-06-001.
- StreamNet. 2014. StreamNet Mapper. http://www.streamnet.org/mapping_apps.cfm. Accessed July 2018.
- U.S. Army Corps of Engineers (Corps). 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 Environmental Laboratory. Vicksburg, MS. Publication # ERDC/EL TR-10-3.
- U.S. Fish and Wildlife Service. National Wetland Inventory (NWI). Wetlands Mapper. <http://www.fws.gov/wetlands/>. Accessed July 2018.
- Washington State Department of Fish and Wildlife (WDFW). 2011. SalmonScape. (<http://wdfw.wa.gov/mapping/salmonscape/index.html>). Accessed July 2018.
- Washington State Department of Fish and Wildlife (WDFW). 2013a. Threatened and Endangered Wildlife in Washington: 2012 Annual Report. Listing and Recovery Section, Wildlife Program, Washington Department of Fish and Wildlife, Olympia, WA. 251 pp.
- Washington State Department of Fish and Wildlife (WDFW). 2013b. Priority Habitats and Species: PHS on the Web. (<http://wdfw.wa.gov/mapping/phs/>). Accessed July 2018.

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Appendix A

Critical Area Study Map
(Site Plan)

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CRITICAL AREA STUDY MAP FOUR SEASONS LLC - 4634 E MERCER WAY SFR

REVISION 1 SITE PLAN

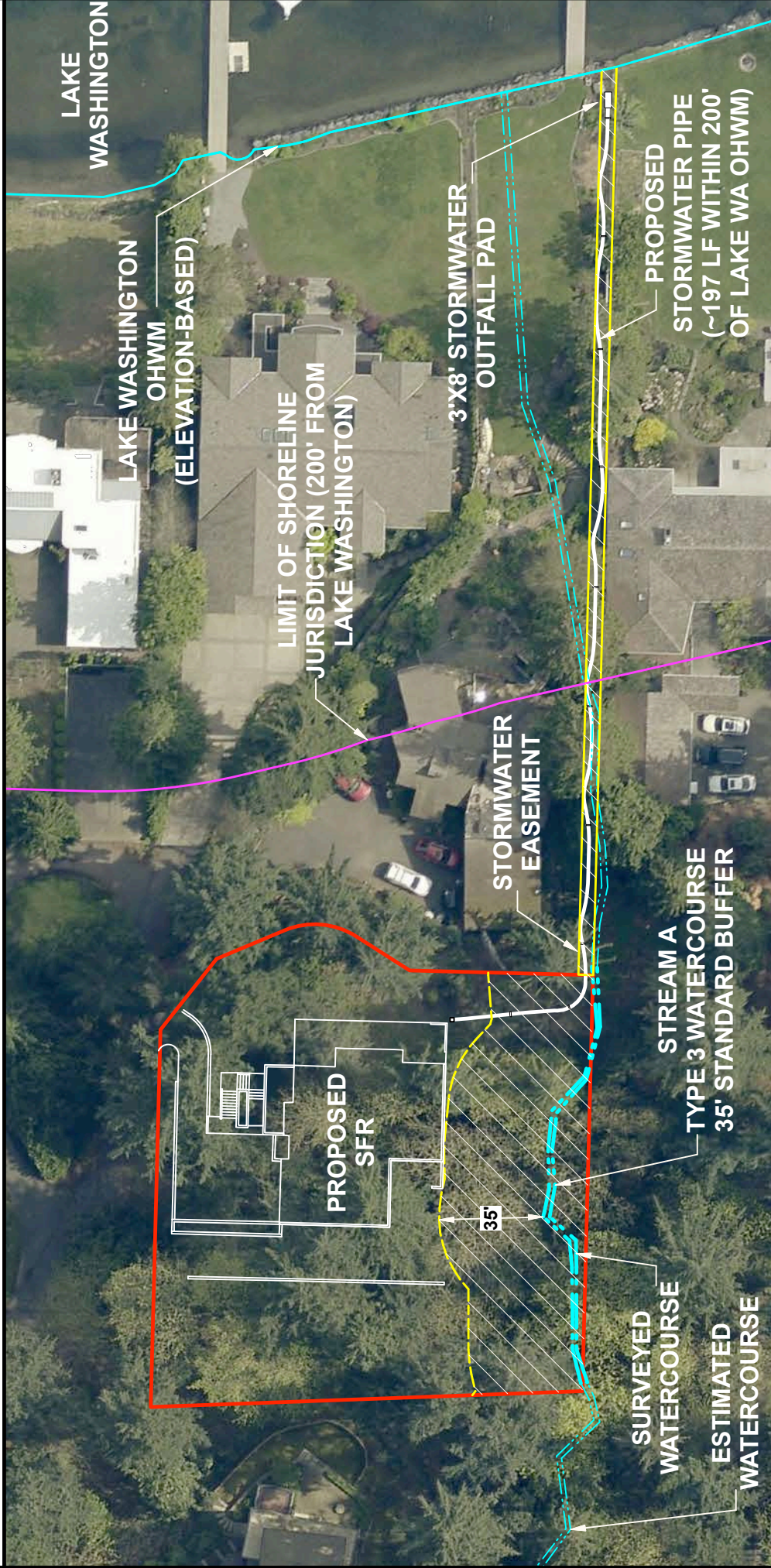


IMAGE SOURCE: KING COUNTY
DATA SOURCES: APS SURVEY AND MAPPING
(STREAM OHWM, PARCEL), STUDIO19
ARCHITECTS (PROPOSED IMPROVEMENTS)



Scale 1" = 50'



LEGEND

- TYPE 3 WATERCOURSE (DELINEATED)
- TYPE 3 WATERCOURSE (ESTIMATED)
- WATERCOURSE BUFFER
- PROPERTY BOUNDARY

Wetland Resources, Inc.
Restoration / Mitigation / Rehabilitation / Habitat Creation / Permit Assistance
 9505 19th Avenue S.E. Suite 106 Everett, Washington 98208
 Phone: (425) 337-3174
 Fax: (425) 337-3045
 Email: mailbox@wetlandresources.com

Critical Area Study Map
Four Seasons LLC
4634 E Mercer Way SFR
 REVISION 1
 Four Season Homes, LLC
 Attn: Paul Maksimchuk
 11319 24th Street E
 Edgewood, WA 98372
 Sheet 1/1
 WRI Job #: 17067
 Drawn by: NP
 Date: 10/1/2018

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