CRITICAL AREAS REPORT AND BUFFER AVERAGING PLAN

ORCAS MOON COTTAGES
KIRKLAND, WASHINGTON

Prepared For:
ORCAS MOON, LLC

Prepared By:
TALASAEA CONSULTANTS, INC.

21 July 2016
(Revised 31 May 2017)

Critical Areas Report and Buffer Averaging Plan

Orcas Moon Cottages
Kirkland, Washington

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21 July 2016
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EXECUTIVE SUMMARY

PROJECT NAME:	Orcas Moon Cottages
CLIENT:	Orcas Moon, LLC
SITE LOCATION:	Property is northwest of the intersection of 20th Avenue and 5th Street and south of Forbes Creek Drive in Kirkland, Washington. The Public Land Survey System location of the property is the southwest ¼ of Section 32, T26N, R5E, Willamette Meridian.
PROJECT STAFF:	Bill Shiels, Principal; Ann Olsen, Senior Project Manager; David R. Teesdale, Senior Wetlands Ecologist, Matt Wagner, Landscape Designer
FIELD SURVEY:	Site was evaluated and critical areas delineated on 8 and 19 April 2016, and again on 21 December 2016.

DETERMINATION: The Orcas Moon Cottages property is located within a City of Kirkland Primary Basin (Forbes Creek). Two wetlands and five streams were identified on the Orcas Moon Property. One wetland was identified offsite to the west of the property. The onsite wetlands were all rated as City of Kirkland Type 3 wetlands. The offsite wetland was rated as a City of Kirkland Type 2 wetland. Type 2 wetlands within a Primary Basin have a 75-foot standard buffer. Type 3 wetlands within a Primary Basin have a 50-foot standard buffer. The streams were rated as City of Kirkland Class B waters. Class B waters within a Primary Basin have a 60-foot standard buffer.

HYDROLOGY: Hydrology for Wetlands A and C is provided by shallow groundwater seepage on a slope. Hydrology for Wetland B is supported entirely by stream flow from Stream 4, which is supported by Wetland C.

SOILS: Three soil types are mapped on the property. These are Kitsap silt loam (2 to 8 percent slope), Kitsap silt loam (15 to 30 percent slope), and Indianola loamy fine sand (4 to 15 percent). These soils are not listed as hydric by the National Technical Committee on Hydric Soils.

VEGETATION: Vegetation within Wetland A is a mixture of sparse herbaceous and scrub-shrub species with a significant portion of bare soil present. Species include skunk cabbage (*Lysichiton americanus*), piggyback plant (*Tolmiea menziesii*), slough sedge (*Carex obnupta*), field and tall horsetail (*Equisetum arvense* and *E. telmateia*), lady fern (*Athyrium filix-femina*), salmonberry (*Rubus spectabilis*), and young red alder (*Alnus rubra*). Vegetation within Wetland B includes American brooklime (*Veronica americana*), lady fern, piggyback plant, and slough sedge. Vegetation within Wetland C is mostly scrub-shrub species, comprised predominantly of salmonberry, lady fern, skunk cabbage, slough sedge, and red alder.

PROPOSED DEVELOPMENT: The Client proposes to develop the Orcas Moon Project as a cottage unit development. Fifteen (15) units of cottages will be constructed in two separate groups on the property. Spreading the development out into two different groups allows the project to maximize the buildable area outside of steep slope zones. The two cottage unit groups will be arranged around rain gardens, which will handle all stormwater runoff from paved parking and foot trail systems as well as from rooftop runoff.

The proposed development will not directly impact wetlands or streams on the subject property. However, it will be necessary to reduce the critical areas buffers by one-third as allowed by Kirkland Zoning code. This is permitted under KMC §90.60(2)(a) and §90.100(1)(a) for buffer averaging. Sufficient area is available onsite to provide additional buffer area that is equal in functions and services to the buffer areas being reduced. Further enhancement of buffer vegetation is not necessarily required since the quality of the added buffer is equal to the quality of the area reduced. No work within the steep sloped ravines is being proposed at this time due to concerns of creating unstable earth conditions.

There will be no loss of habitat function of existing wetlands or streams onsite resulting from the proposed development plan. The proposed buffer averaging plan will provide additional buffer that exceeds the functions and services of the reduced buffer area.

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Chapter 1. INTRODUCTION

1.1 Report Purpose

This report is the result of a critical areas study of the Orcas Moon Cottages property (referred to hereinafter as "Project Site" or "Site). The Site is located within the Forbes Creek basin of Kirkland (**Figure 1**). The purpose of this report is to identify, categorize, and describe existing site conditions, such as wetlands, streams, or other critical habitats, and their respective buffers. The report has been prepared to comply with the requirements of Kirkland Municipal Code Chapter 90 – Drainage Basins.

This report will provide and describe the following information:

- General property description;
- Methodology for critical areas investigation;
- Results of critical areas background review and field investigation; and
- Regulatory review.

1.2 Statement of Accuracy

Critical areas characterizations and ratings were conducted by trained professionals at Talasaea Consultants, Inc., and adhered to the protocols, guidelines, and generally accepted industry standards available at the time the work was performed. The conclusions in this report are based on the results of analyses performed by Talasaea Consultants and represent our best professional judgment. To that extent and within the limitation of project scope and budget, we believe the information provided herein is accurate and true to the best of our knowledge. Talasaea does not warrant any assumptions or conclusions not expressly made in this report, or based on information or analyses other than what is included herein.

Chapter 2. GENERAL PROPERTY DESCRIPTION AND LAND USE

2.1 Project Location

The Project Site is located northwest of the intersection of 20th Avenue and 5th Street in the City of Kirkland, Washington (**Figure 2**). The Site extends northward from 20th Avenue to Forbes Creek Drive. The Site includes two tax parcels: Parcel A (3890100055), and Parcel B (3890100050). The Site encompasses approximately 7.1 acres. The Public Land Survey System location of the Site is southwest ¼ of Section 32, T26N, R5E, Willamette Meridian.

2.2 General Property Description

The Site is currently undeveloped and forested with second-growth mixed coniferous and deciduous trees. The topography of the Site is moderately sloped with five ravines extending generally in a north-south orientation. The Site generally slopes downward from 20th Avenue to Forbes Creek Drive.

2.3 Land Use and Zoning

The Site is zoned RS-12.5 or Single Family Residential. The Site is currently undeveloped. However, a single-family residence and an associated outbuilding did exist on Parcel A prior to 1936 (date of earliest aerial photo available). This residence

was still visible as of 1952. This residence was removed from Parcel A, although its driveway is still present. Properties to the northeast and south are developed as single-family residential. Properties to the west and southeast are currently undeveloped.

Chapter 3. METHODOLOGY

The critical areas analysis of the Site involved a two-part effort. The first part consisted of a preliminary assessment of the Site and the immediate surrounding area using existing published environmental information. This information includes:

1. Wetland and soils information from resource agencies;
2. Critical areas information from the City of Kirkland and King County;
3. Orthophotography and LIDAR imagery; and,
4. Relevant studies completed or ongoing in the vicinity of the Site.

The second part consisted of site investigations where direct observations and measurements of existing environmental conditions were made. Observations included plant communities, soils, hydrology, and stream conditions. This information was used to help characterize the site and define the limits of critical areas onsite and offsite for regulatory purposes (see **Section 3.2 – Field Investigation** below).

3.1 Background Information Reviewed

Background information from the following sources was reviewed prior to field investigations:

- US Fish and Wildlife Service (USFWS) Wetlands Online Mapper (National Wetlands Inventory)(U.S. Fish and Wildlife Service) (www.wetlandsfws.er.usgs.gov/wtlnds/launch.html);
- Natural Resources Conservation Service, Web Soil Survey (Natural Resources Conservation Service)(www.websoilsurvey.nrcs.usda.gov/app);
- Natural Resources Conservation Service National Hydric Soils List by State (Natural Resources Conservation Service)(www.soils.usda.gov/use/hydric/lists/state.html);
- City of Kirkland GIS database (City of Kirkland, 2015);
- King County GIS database (King County 2015);
- King County iMap online mapping program (King County);
- LIDAR data from King County GIS (2006);
- Orthophotography from Earth Explorer (2016);
- WDFW Priority Habitats and Species (PHS) Database on the Web (Washington State Department of Fish and Wildlife)(wdfw.wa.gov/mapping/phs); and
- Washington Department of Natural Resources Natural Heritage GIS database, 2015;
- Fish usage data from SalmonScape (http://apps.wdfw.wa.gov/salmonscape/map.html); and

- StreamNet (http://www.streamnet.org/data/interactive-maps-and-gis-data/)

3.2 Field Investigation

The Site was evaluated and critical areas delineated on 8 and 19 April 2016, and again on 21 December 2016. The boundaries of wetlands and the ordinary high water mark (OHWM) of streams were flagged in the field for later professional surveying.

The wetland delineation utilized the routine approach described in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (U.S. Army Corps of Engineers, 2010). The ordinary high water mark (OWHM) for any streams found on the Site was determined and delineated using the methodology described by Washington State Department of Ecology's "*Determining the Ordinary High Water Mark on Streams in Washington State"* (Olson and Stockdale 2008). Wetlands and streams were classified according to City of Kirkland Municipal Code, Chapter 90 – Drainage Basins.

Plant species were identified according to the taxonomy of Hitchcock and Cronquist (Hitchcock, *et al*. 1969). Taxonomic names were updated and plant wetland status was assigned according to *North American Digital Flora: National Wetland Plant List, Version 2.4.0* (Lichvar, *et al*. 2012). Wetland classes were determined using the U.S. Fish and Wildlife Service's system of wetland classification (Cowardin, *et al*. 1979). Vegetation was considered hydrophytic within a suspected wetland area if greater than 50% of the dominant plant species had a wetland indicator status of facultative or wetter (i.e., facultative, facultative wetland, or obligate wetland).

Wetland hydrology was determined based on the presence of hydrologic indicators listed in the Corps Regional Supplement. These indicators are separated into Primary Indicators and Secondary Indicators. To confirm the presence of wetland hydrology, one Primary Indicator or two Secondary Indicators must be demonstrated. Indicators of wetland hydrology may include, but are not necessarily limited to; drainage patterns, drift lines, sediment deposition, watermarks, stream gauge data and flood predictions, historic records, visual observation of saturated soils, and visual observation of inundation.

Soils on the Site were considered hydric if one or more of the hydric soil indicators listed in the Corps' Regional Supplement were present. Indicators include: presence of organic soils; reduced, depleted or gleyed soils, or redoximorphic features in association with reduced soils.

Wetlands were rated using the City of Kirkland's wetland rating system. The wetland datasheets are contained in **Appendix A**.

Chapter 4. RESULTS

4.1 Analysis of Existing Information

The following sources provided information on site conditions based on data compiled from resource agencies and local government. For the purposes of this report, the term "vicinity" will mean an area within ¼ mile of the Project Site.

4.1.1 USFWS Wetlands Online Mapper (National Wetlands Inventory)

The USFWS Wetlands Online Mapper maps six wetland units within the vicinity of the Site (**Figure 3**). No wetlands are indicated on or extending onto the site. Three of the wetlands are palustrine forested (one is indicated as palustrine forested/scrub-shrub), two are palustrine unconsolidated bottom, and one is a palustrine scrub-shrub wetland.

4.1.2 Natural Resources Conservation Service Web Soil Survey

Three soil types are mapped on the property (**Figure 4**). These are Kitsap silt loam (KpB, 2 to 8 percent slope), Kitsap silt loam (KpC, 15 to 30 percent slope), and Indianola loamy fine sand (InC, 4 to 15 percent).

The Kitsap series is made up of moderately well drained soils that formed in glacial lake deposits, under a cover of conifers and shrubs. These soils are on terraces and strongly dissected terrace fronts. The surface layer and subsoil are very dark brown and dark yellowish brown silt loam.

The Indianola series is made up of somewhat excessively drained soils that formed under conifers in sandy, recessional, stratified glacial drift. These undulating, rolling, and hummocky soils are on terraces. These soils are generally brown, dark yellowish-brown, and light olive-brown loamy fine sand.

The Kitsap and Indianola soil series are not listed as hydric by the National Technical Committee on Hydric Soils.

4.1.3 StreamNet and SalmonScape GIS Databases

StreamNet and SalmonScape maintain data concerning the usage or potential usage of streams in the Pacific Northwest. StreamNet maps coho (*Oncorhynchus kisutch*) as utilizing Forbes Creek for rearing and migration. No other salmonid species are mapped within the vicinity of the Site.

SalmonScape maps four species utilizing or having the potential to utilize Forbes Creek. These are fall chinook (*O. tshawytscha*), coho, winter steelhead (*O. mykiss*), and sockeye (*O. nerka*). Coho are indicated as documented rearing. Sockeye are indicated as documented presence. Both fall chinook and winter steelhead are indicated as modeled presence[1].

4.1.4 King County GIS Database

King County GIS does not map any features on the Site. However, it does map some features within the vicinity of the Site (**Figure 5**). These features include two water bodies, two streams, a floodway, and a flood plain. One of the streams is associated with the floodway and floodplain, and is identified as Forbes Creek. The second stream is unnamed on the King County GIS database.

[1] "Modeled presence" indicates that physical parameters of a particular stream may support the presence of a salmonid species, but no actual documentation of their presence exists.

4.1.5 City of Kirkland Critical Areas Map

The City of Kirkland does not map any wetlands on the Site (**Figure 6**). However, it does map two wetlands in the vicinity of the Site. One wetland is located near the southwest property corner on an adjacent parcel. The other wetland is associated with Forbes Creek to the north of the Site.

The City of Kirkland also maps five streams on the Site, and Forbes Creek to the north of the property. At least four more streams are mapped on properties to the east and west of the Site.

Finally, the City of Kirkland maps a floodplain and floodway in the general vicinity of Forbes Creek.

4.2 Analysis of Existing Site Conditions

Two wetlands and five streams were identified during our evaluation of the Site (see **Figure 7** and **Sheet W1.0**). An additional wetland was identified off site to the west, but was not delineated. It was, however, rated using the City of Kirkland's wetland rating system (Plate 26).

4.2.1 Wetlands

4.2.1.1 Wetland A

Wetland A is an approximately 5,900 sf wetland located near the southwestern corner of the Site (Parcel A). It appears to have been created by a slump in the recent past, based on the age of the alders growing within Wetland A. The wetland is a slope wetland that provides hydrology for one of the five onsite streams.

Vegetation within Wetland A consists primarily of skunk cabbage (*Lysichiton americanus*), piggyback plant (*Tolmiea menziesii*), slough sedge (*Carex obnupta*), field and tall horsetail (*Equisetum arvense* and *E. telmateia*), lady fern (*Athyrium filix-femina*), salmonberry (*Rubus spectabilis*), and young red alder (*Alnus rubra*).

Wetland A was rated using the City of Kirkland's wetland rating system. The wetland scored 26 points, which satisfies the criteria for characterization as a Type 2 wetland. Type 2 wetlands located within a Primary Basin (Forbes Creek) have a 75-foot standard buffer. Wetland buffers may be modified through buffer averaging, provided that the minimum buffer width at any one point is not less than 50 feet and that the total area of the averaged buffer is not less than the area of the standard buffer.

4.2.1.2 Wetland B

Wetland B is a very small (approximately 170 sf) wetland that formed within an old concrete cistern. The cistern is constructed within the ravine for one of the onsite streams (Stream 4) and may have provided water for the residence that existed on Parcel A. Over time, this cistern has silted in and wetland vegetation has become established. Vegetation in Wetland B consists of American brooklime (*Veronica americana*), lady fern, piggyback plant, and slough sedge.

Wetland B scored 17 points using the City of Kirkland wetland rating system. This satisfies the criteria for characterization as a Type 3 wetland. Type 3 wetlands located

within a Primary Basin have a 50-foot standard buffer. Wetland buffers may be modified through buffer averaging, provided that the minimum buffer width at any one point is not less than 33 feet and that the total area of the averaged buffer is not less than the area of the standard buffer.

4.2.1.3 Wetland C (Off Site)

Wetland C is a slope wetland that is located to the west of the southwest property corner. This wetland was not delineated since it resides off property. However, we estimate its size to be approximately 6,200 sf. Vegetation consists predominantly of salmonberry, lady fern, skunk cabbage, slough sedge, and red alder. Wetland C is the headwaters of one of the onsite streams (Stream 4).

Wetland C scored 25 points using the City of Kirkland wetland rating system. This satisfies the criteria for characterization as a Type 2 wetland. Type 2 wetlands located within a Primary Basin have a 75-foot standard buffer. Due to the location of this wetland, buffer averaging will likely not be possible.

4.2.1.4 Wetland D

Wetland D is a small slope wetland located within the southern portion of the right-of-way for Forbes Creek Drive. Vegetation within the wetland is managed through periodic mowing. However, a small patch of slough sedge (*Carex obnupta*) was discernable.

Wetland D scored 13 points using the City of Kirkland Wetland rating system. This satisfies the criteria for characterization as a Type 3 wetland. Type 3 wetlands located within a Primary Basin have a 50-foot standard buffer. Wetland buffers may be modified through buffer averaging, provided that the minimum buffer width at any one point is not less than 33 feet and that the total area of the averaged buffer is not less than the area of the standard buffer.

4.2.2 Streams

4.2.2.1 Stream 1

Stream 1 starts at the outfall of a stormwater pipe located on the north side of 20th Avenue (see **Figure 7** and **Sheet W1.0**). The stream flows onto the Site at the southeast property corner and flows in a northerly direction for approximately 70 feet. Then, the stream flows off property to the east. The stream channel is in a deeply incised ravine that extends from the stormwater outfall.

Stream 1 satisfies the criteria for categorization as a City of Kirkland Class B stream. Class B streams within a Primary Basin have a 60-foot standard buffer. This buffer may be reduced to 39.6 feet through buffer averaging, provided that the total area of the reduced buffer is not less than the area of the standard buffer.

4.2.2.2 Stream 2

Stream 2 starts at the outfall of two stormwater pipes located on the north side of 20th Avenue, approximately 170 feet west of the stormwater outfall for Stream 1. As with Stream 1, Stream 2 flows within a deeply incised ravine. The stream flows aboveground for approximately 390 feet where it flows into a buried pipe. The pipe

extends to the northeast for approximately 160 feet. The outfall of this pipe is within the channel for Stream 5.

Stream 2 satisfies the criteria for categorization as a City of Kirkland Class B stream. Class B streams within a Primary Basin have a 60-foot standard buffer. This buffer may be reduced to 39.6 feet through buffer averaging, provided that the total area of the reduced buffer is not less than the area of the standard buffer. There is no buffer requirement for the piped portion of Stream 2. However, stream buffers are measured in all directions from culvert ends.

4.2.2.3 Stream 3

Stream 3 starts near the southwest corner of the Site in an area of a previous soil slump (the same slump that likely created Wetland A). There are at least three pipe outfalls mapped to the south of the headwaters of Stream 3. As with Stream 1 and 2, the pipes carry stormwater from the development to the south of 20th Avenue. Stream 3 begins as two separate seeps and one overland runoff from a stormwater pipe. The three headwater branches coalesce towards the northern tip of Wetland A. At this point, the combined stream flows in a deeply incised ravine for approximately 220 feet. The stream then enters a buried pipe that extends to the northeast for approximately 280 feet. The pipe then discharges into a roadside ditch along Forbes Creek Road.

Stream 3 satisfies the criteria for categorization as a City of Kirkland Class B stream. Class B streams within a Primary Basin have a 60-foot standard buffer. This buffer may be reduced to 39.6 feet through buffer averaging, provided that the area of the reduced buffer is not less than the area of the standard buffer. There is no buffer requirement for the piped portion of Stream 3. As state in the discussion of Stream 2, stream buffers are measured in all directions from culvert ends.

4.2.2.4 Stream 4

The headwaters for Stream 4 are within Wetland C off property to the west. Stream 4 flows onto the Site approximately 130 feet north of the southwest property corner and flows within a deeply incised ravine for approximately 100 feet (this aboveground portion of Stream 4 includes Wetland B). At this point, the stream enters a buried pipe. The pipe extends to the northeast for approximately 140 feet and discharges into a roadside ditch along Forbes Creek Road.

Stream 4 satisfies the criteria for categorization as a City of Kirkland Class B stream. Class B streams within a Primary Basin have a 60-foot standard buffer. This buffer may be reduced to 39.6 feet through buffer averaging, provided that the area of the reduced buffer is not less than the area of the standard buffer. There is no buffer requirement for the piped portion of Stream 4. As state in the discussion of Stream 2, stream buffers are measured in all directions from culvert ends.

4.2.2.5 Stream 5

Stream 5 starts off property to the east. Prior to the development of subdivision along Forbes Creek Road adjacent to the east of the Site, Stream 5 did not flow onto the subject property. Stream 5 is collected offsite in a pipe and shunted westward along the

south side of the aforementioned subdivision. This pipe discharges into a deeply incised ravine that flows in a westerly direction onto the Site, then flows in a northwesterly direction towards Forbes Creek Road. As previously mentioned, the piped portion of Stream 2 discharges into the Stream 5 ravine.

Stream 5 satisfies the criteria for categorization as a City of Kirkland Class B stream. Class B streams in a Primary Basin have a 60-foot standard buffer. This buffer may be reduced to 39.6 feet through buffer averaging, provided that the area of the reduced buffer is not less than the area of the standard buffer.

Chapter 5. REGULATORY REVIEW

5.1 City of Kirkland Critical Areas Regulations

Wetlands and streams on the Site are subject to City of Kirkland critical areas regulations under Chapter 90 – Drainage Basins. City of Kirkland currently uses its own wetland rating and water typing systems. The wetland rating system appears to be based on the Washington Department of Ecology's (WDOE) Washington State Wetland Rating System for Western Washington (1993), which is not comparable with the current WDOE Washington State Wetland Rating System for Western Washington (2014). Similarly, their method of water typing for streams is not comparable with the current Washington Department of Natural Resources (WDNR) water typing system, which is promulgated in WAC 222-16-030.

Wetland buffers are determined based on the wetland's rating and whether it is located within a Primary Basin or a Secondary Basin. Primary Basins are defined as the basin that supports one of Kirkland's major stream systems. Similarly, stream buffers are based on the stream's class and whether it is located within a Primary Basin.

5.2 State and Federal Regulations

Wetlands and streams on the Site are subject to applicable State and Federal regulations. Wetland impacts are regulated at the Federal level by Sections 404 and 401 of the Clean Water Act. The U.S. Army Corps of Engineers (Corps) is responsible for administering compliance with Section 404 via the issuance of Nationwide or Individual Permits for any fill or dredging activities within wetlands under Corps jurisdiction. Any project that is subject to Section 404 permitting is also required to comply with Section 401 Water Quality Certification, which is administered by the Washington State Department of Ecology (WDOE). No dredging or filling of onsite wetlands is proposed for the current site development plan. Therefore, the project will not need to apply for any Section 404 Nationwide or Individual Permits or Section 401 Water Quality Certification.

Any work within, over, or under the Ordinary High Water Mark of a stream requires a Hydraulic Project Approval (HPA) from the Washington Department of Fish and Wildlife (WDFW), pursuant to the State Hydraulic Code (Chapter 77.55 RCW).

Chapter 6. PROPOSED PROJECT

6.1 Project Description

Orcas Moon, LLC is proposing to develop the Orcas Moon property with 15 units of cottage housing (**Sheet W1.1**). The site development will be divided into two separate groups based on available land that is not constrained by steep slopes. For the purposes of this report, the groups will be called Group 1 and Group 2. Group 1 is located in the southwestern portion of the Site adjacent to 20th Avenue. Group 2 is located in the southeastern portion of the Site, also adjacent to 20th Avenue. Group 1 will include 9 cottage units, and Group 2 will provide 6 cottage units. Parking for Groups 1 and 2 will be provided through a mixture of covered and uncovered stalls. There will be one covered stall for every cottage unit. Access to the Group 1 and 2 cottage units will be provided by sidewalks from the parking areas.

The development plan will provide three open space areas for Group 1 and two open space areas for Group 2. In addition, an approximately 22,158 sf area located in the northeast corner of the Site will be dedicated as an NGPA.

Two utility easements will be established on the Site servicing the two development groups described previously. These easements will provide stormwater and sewer pipe routing to the northern portion of the property. The stormwater pipes will connect with a proposed stormwater vault adjacent to Forbes Creek Drive (this vault will be located outside of existing wetland and stream buffers). The sanitary sewer pipes will connect to an existing sewer main located in the roadway for Forbes Creek Drive.

6.2 Project impacts

The project has been designed to avoid all direct impacts to wetlands and streams on the Site. However, it will be necessary to impact wetland and stream buffers in order to provide the required yard setbacks for the cottage units, construction of some of the parking areas, pedestrian paths and walkways, and required utilities (such as stormwater and sanitary sewer lines) (**Sheet W1.1**). Buffers will be reduced in these areas of impact and mitigated for using buffer averaging. In all, there will be several areas of buffer. The proposed individual buffer reduction areas are described below.

Approximately 25,255 sf of buffer will be reduced in order to provide sufficient development area for the Site.

Buffer reduction with averaging is permitted under KZC §90.100(1)(a), which states:

> "Buffer averaging requires that the area of the buffer resulting from the buffer averaging be equal in size and quality to the buffer area calculated by the standards specified in KZC 90.90(1). Buffers may not be reduced at any point by more than one-third (1/2) of the standards in KZC 90.90(1). Buffer calculations shall only consider the subject property."

Within the reduced buffer areas, there will be approximately 1,031 sf of minor impacts resulting from trail construction (trails are allowed within the outer ½ of a critical area buffer and are considered a minor improvement under §90.90(5), which states:

"Minor improvements may be located within the sensitive area buffers specified in subsection (1) of this section. These minor improvements shall be located within the outer one-half (½) of the sensitive area buffer, except where approved stream crossings are made. The Planning Official shall approve a proposal to construct a minor improvement within a sensitive area buffer if:

a) It will not adversely affect water quality;
b) It will not adversely affect fish, wildlife, or their habitat;
c) It will not adversely affect drainage or storm water detention capabilities;
d) It will not lead to unstable earth conditions or create erosion hazards or contribute to scouring actions; and
e) It will not be materially detrimental to any other property in the area of the subject property or to the City as a whole, including the loss of significant open space or scenic vistas."

Code provisions for §90.90(5) and §90.100(1)(a) are discussed below (**Section 6.3**).

6.3 Proposed Buffer Averaging Plan

The proposed mitigation for the buffer reduction will be through buffer averaging. Sufficient area is available on the Site to provide meaningful buffer averaging. We have identified several areas on the Site that will provide additional buffer area. The total area of buffer addition is approximately 25,491sf for a net increase of approximately 156 sf.

6.3.1 Agency Policies and Guidance

KZC §90.90(5), as stated previously in **Section 6.2**, states that minor improvements may be located within the outer one-half of a sensitive area buffer, provided that:

a) "It will not adversely affect water quality;

   The proposed trails will be constructed using permeable paving material, such as wood chips or wood bark. The amount of buffer reduction resulting from the proposed trails is minimal compared to the total area of buffer reduction. No disturbance to vegetation or soils will occur between the trail and sensitive area that could result in potentially adverse alterations of water quality.

b) It will not adversely affect fish, wildlife, or their habitat;

   The trails will be constructed next to non-fish-bearing streams, so there will be no potential for an adverse effect to fish. The streams are located within relatively steep, well-vegetated ravines, which will both provide habitat to wildlife while protecting them from human-caused noise or stress. There should be no adverse effect to fish, wildlife, or their habitat resulting from the proposed trail construction.

c) It will not adversely affect drainage or storm water detention capabilities;

All stormwater will be collected within the development footprint of the project and directed via stormwater pipes to a detention vault to be located near Forbes Creek Drive. The source of water for the onsite streams is discharge from stormwater pipes off of 20th Avenue. No development actions will occur that will affect the sources of water for the onsite streams, nor will the proposed trails likely affect these drainages.

d) It will not lead to unstable earth conditions or create erosion hazards or contribute to scouring actions;

The proposed trails will require minimal grading for construction and will be paved using permeable materials, such as wood chips or wood bark. Construction of the trails will take into consideration existing slope and topography so that they will not create unstable earth conditions or erosion hazards.
and

e) It will not be materially detrimental to any other property in the area of the subject property or to the City as a whole, including the loss of significant open space or scenic vistas."

It is unlikely that the proposed trails will create conditions that will affect the Site or other properties in the area. Additionally, the proposed trails will be unlikely to affect the City as a whole.

KZC §90.100(1)(a), as stated previously in **Section 6.2**, requires that the averaged buffer area be equal in size and quality to the standard buffer area. KZC §90.100(2) provides the framework for process review and decision criteria, stating:

"…Modification requests for averaging or reduction/enhancement of Class B stream buffers shall be considered by the Planning Official pursuant to Process 1, described in Chapter 145 KZC. …

An improvement or land surface modification shall be approved in a stream buffer only if:

a. It is consistent with 'Kirkland's Streams, Wetlands, and Wildlife Study' (The Watershed Company, 1998) and the 'Kirkland Sensitive Areas Regulatory Recommendations Report' (Adolfson Associates, Inc. 1998);

The Site is located within the Forbes Creek Basin. Two wetlands are mapped by the Watershed Company report in the general vicinity of the Site. These are Forbes 1 and Forbes 3. Forbes 1 is described as being relatively high value, despite the amount of development pressure surrounding it. Forbes Creek flows through Forbes 1. Forbes 3, which is located north of Forbes Creek Drive and approximately 880 feet west of the Site, is described as low to moderate quality. An unnamed stream is

mapped flowing through Forbes 3, crossing under Forbes Creek Drive, and connecting with Forbes Creek. No wetlands are mapped by the Watershed Company report on the Site. However, it appears that one stream was mapped on the Site. This stream appears to be roughly in line with Stream 2. No other information is provided concerning this stream.

General recommendations provided in the Watershed Company report include improvements of stormwater treatment and detention, protection of existing wetlands and streams, wetland enhancements, and improving fish passage issues. Improving fish passage issues is beyond the scope of this project in that no streams with usable fish habitat exist on the Site. The proposed project will, however, utilize the best available technology for stormwater treatment and detention, which will address water quality and hydroperiod issues to a limited extent on Forbes Creek. No direct impacts to wetlands are being proposed, so there is no reason based in the applicable code for enhancing onsite wetlands. Stream and wetland buffers will be maintained.

Recent comments provided by the Watershed Company made reference to Washington Department of Ecology (WDOE) guidelines that suggest that buffers on steep slopes should be increased to compensate for a reduced ability for steep slope areas to filter out pollutants. While we agree with the concept as outlined by WDOE, we also feel that it does not take into consideration current building standards and stormwater management. An increased buffer width would make sense if pollutants were able to flow off of the developed Site towards a wetland or stream. However, required stormwater infrastructure (curb, gutter, sidewalk, etc.) will capture all precipitation falling on the developed area and direct it towards the proposed stormwater system for the project. CC&R's will be established that will limit the use of fertilizers, herbicides, or pesticides on the project's greenscape. It is our contention, therefore, that increasing the width of the buffer on steep slope areas will not provide any appreciable protection to existing critical areas and is not needed.

The Adolfson report reiterates much of what was stated in the Watershed Company report, with the admonition to provide a "greater degree of protection" to wetlands and streams located within a Primary Basin compared to wetlands and streams located within Secondary Basins. The Site is located within a Primary Basin (Forbes Creek).

The Adolfson report recommends standard buffer widths and setbacks for wetlands and streams located in Primary Basins. Class B streams are recommended to have a 60-foot standard buffer. Class C streams are recommended to have a 35-foot standard buffer. Both of these widths are provided for by the proposed site development, except where buffer reduction through averaging is proposed.

Buffers for Type 2 and Type 3 wetlands located within a Primary Basin are suggested to be 75 feet and 50 feet, respectively. Both of these buffer widths are provided for by the proposed site development, except where buffer reduction through averaging is proposed. No direct modification of wetlands is proposed by the current site development plan.

Finally, the Adolfson report discusses Significant Habitat Areas. The report recommends that the City establish Wildlife Habitat Conservation Areas to protect known populations of Federally- and State-listed threatened or endangered species. The Site has not been designated as a Wildlife Habitat Conservation Area. However, it cannot be ignored that significant wildlife habitat potential is present onsite. The proposed site development plan protects a significant portion of the Site, including the areas with the highest value habitat (steep sloped ravines and associated wetlands and streams). Approximately 70-percent of the Site will remain undeveloped. This habitat is separated from the main Forbes Creek 1 habitat area by Forbes Creek Drive, but may still provide additional value for birds and other wildlife. Additionally, habitat connections to the undeveloped properties to the east and west will be maintained. These properties include Crestwoods Park to the east of the Site and Juanita Bay Park to the west (Juanita Bay Park also exists north of Forbes Creek Drive, but is separated from the Site by existing residential development).

b. It will not adversely affect water quality;

As stated for our evaluation of §90.90(5)(a), all stormwater will be collected within the development and directed via stormwater pipes to a stormwater detention vault to be constructed adjacent to Forbes Creek Drive. The proposed project will not adversely affect the quality of water within Wetland A or associated streams.

c. It will not adversely affect fish, wildlife, or their habitat;

As stated for our evaluation of §90.90(5)(b), the proposed buffer reduction with averaging will not adversely affect fish, wildlife, or their habitat.

d. It will not have an adverse effect on drainage and/or stormwater detention capabilities;

As stated for our evaluation of §90.90(5)(c), hydrology for the onsite wetlands and streams is from stormwater discharge off of 20th Avenue. No work will occur that will alter this source of hydrology. Stormwater detention for the developed portion of the Site will be provided by a new stormwater detention vault. This vault will be sized in accordance with the

City of Kirkland's stormwater design requirements.

e. It will not lead to unstable earth conditions or create an erosion hazard or contribute to scouring actions;

As stated for our evaluation of §90.90(5)(d), the proposed development will not affect areas of steep slopes, which could lead to unstable earth conditions. Grading and filling to create a level building area will be contained within structural walls. All stormwater will be collected onsite and discharged to a stormwater detention vault; no undetained stormwater will be allowed to leave the building envelope and flow onto the steep slope areas. The proposed project will not increase the amount of water currently flowing within the onsite stream channels, which could result in increased erosion or scouring actions. The boundaries of all proposed work will be contained within silt fencing and construction limits fencing. No disturbance of soils or vegetation outside of the defined construction limits will occur.

f. It will not be materially detrimental to any other property or the City as a whole;

As stated in our evaluation of §90.90(5)(e), the proposed development will not be materially detrimental to any other property or the City as a whole. All construction-related work will be in accordance with the City's development regulations and best management practices.

g. Fill material does not contain organic or inorganic material that would be detrimental to water quality or to fish, wildlife, or their habitat;

Fill material will be locally sourced from clean material and approved by the City prior to placement. It will not contain organic or inorganic pollutants that could affect fish, wildlife, or their habitats. Best management practices (i.e., silt fencing, straw bales, coir logs, etc.) will be used to prevent any fill material from leaving the development envelope.

h. All exposed areas are stabilized with vegetation normally associated with native stream buffers, as appropriate;

At the conclusion of construction work, all exposed earth shall be revegetated with native trees, shrubs, and herbaceous plant species suitable for use within stream and wetland buffers associated with slopes where applicable. Other areas, where trees and shrubs are not specified for planting, will be seeded with a native grass species to stabilize exposed soil. Construction and silt fencing shall remain in place until the native vegetation is sufficiently mature to stabilize and protect previously disturbed earth. Construction and silt fencing shall be removed when

vegetation maturity has been adequately demonstrated.
and

i. There is no practical or feasible alternative development proposal that results in less impact to the buffer."

The proposed site development plan, including the proposed buffer averaging plan, represents the minimum impact to buffers that still allows for an economic development of the property in accordance with City of Kirkland development codes and guidelines.

6.3.2 Proposed Site Mitigation – Buffer Averaging

The areas proposed for buffer addition are currently well vegetated and similar in plant species composition and plant density to the areas of proposed buffer reduction. The functions and services provided by the lost buffer area will be compensated by the functions and services provided by the additional buffer areas. However, the existing shrub vegetation within the areas of buffer reduction and buffer addition includes areas of non-native blackberries. Physical removal of blackberries and their root balls within the steep slope areas will likely result in the types of unstable earth conditions the development and mitigation plan seeks to avoid. Other areas with significantly shallower slopes may benefit from physical removal of blackberries and their root balls.

We propose that the steep slope areas adjacent to the development be left alone at this time. It is our contention that any work within the steep slope areas (removal of blackberry, or planting of trees and shrubs) could lead to the unstable earth conditions that must be avoided under KZC §90.90(5)(e).

The proposed buffer addition areas may be enhanced through the removal of non-native species (i.e., Himalayan blackberry, etc.) and replanted with a variety of native trees and shrubs after physical removal of blackberry. While such enhancement planting is not specifically required under KZC code KZC §90.100(1)(a), we believe that the proposed enhancement planting of the added buffer area will provide better habitat value compared to the habitat provided by the buffer area proposed for reduction.

Finally, we propose that select significant trees removed for construction of the project, or as hazard trees, be retained as large woody debris for the buffer areas. Addition of large woody debris within the buffers will provide additional habitat value to the undeveloped portion of the Site.

Chapter 7. SUMMARY

The Orcas Moon Cottages property is an approximately 7.1 acre assemblage of two tax lots, located in Kirkland, Washington. The property is currently undeveloped and forested. Two wetlands and five streams were identified and delineated on the property. One wetland was identified off property to the west. Orcas Moon, LLC proposes to development of 15 units of cottage housing on the property. The units will be constructed in two groups across the property to take advantage of limited relatively

level areas. Approximately 2 acres of the 7-acre Site will be developed. The remaining portion (approximately 70 percent of the total Site size) will remain in its natural state.

In order for the project to meet specific design standards and economically-feasibility, it will be necessary to reduce stream and wetland buffers adjacent to the development areas. Buffer reductions of up to 1/3rd of the standard buffer width are allowed under City of Kirkland Zoning Code. Mitigation for the proposed buffer reduction will be provided through buffer averaging. Sufficient area is available onsite to offset the proposed buffer reduction.

While buffer enhancement is not specifically required where the functions and values of the added buffer area are equal to or greater than the functions and values of the buffer being reduced, the project will still provide habitat improvements. Enhancement will include the removal of non-native, invasive species, installation of habitat features (large woody debris, bird nesting boxes, and bat boxes), and enhancement planting with a variety of native trees and shrubs. The proposed site development plan will not directly impact wetlands or streams onsite.

Chapter 8. REFERENCES

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Figures

Reference: GIS parcel, road, and water body data from City of Kirkland, 2015.

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FIGURE 1

VICINITY MAP
ORCAS MOON PROJECT
KIRKLAND, WASHINGTON

DESIGN	DRAWN	PROJECT
	DRT	518B

SCALE 1 in : 1000 ft

DATE 30 MAR 2017

REVISED

1

N

Reference: GIS parcel and road data from City of Kirkland, 2015.
Aerial image 2012 from Earth Explorer, downloaded 2016.

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FIGURE 2

SITE MAP
ORCAS MOON PROJECT
KIRKLAND, WASHINGTON

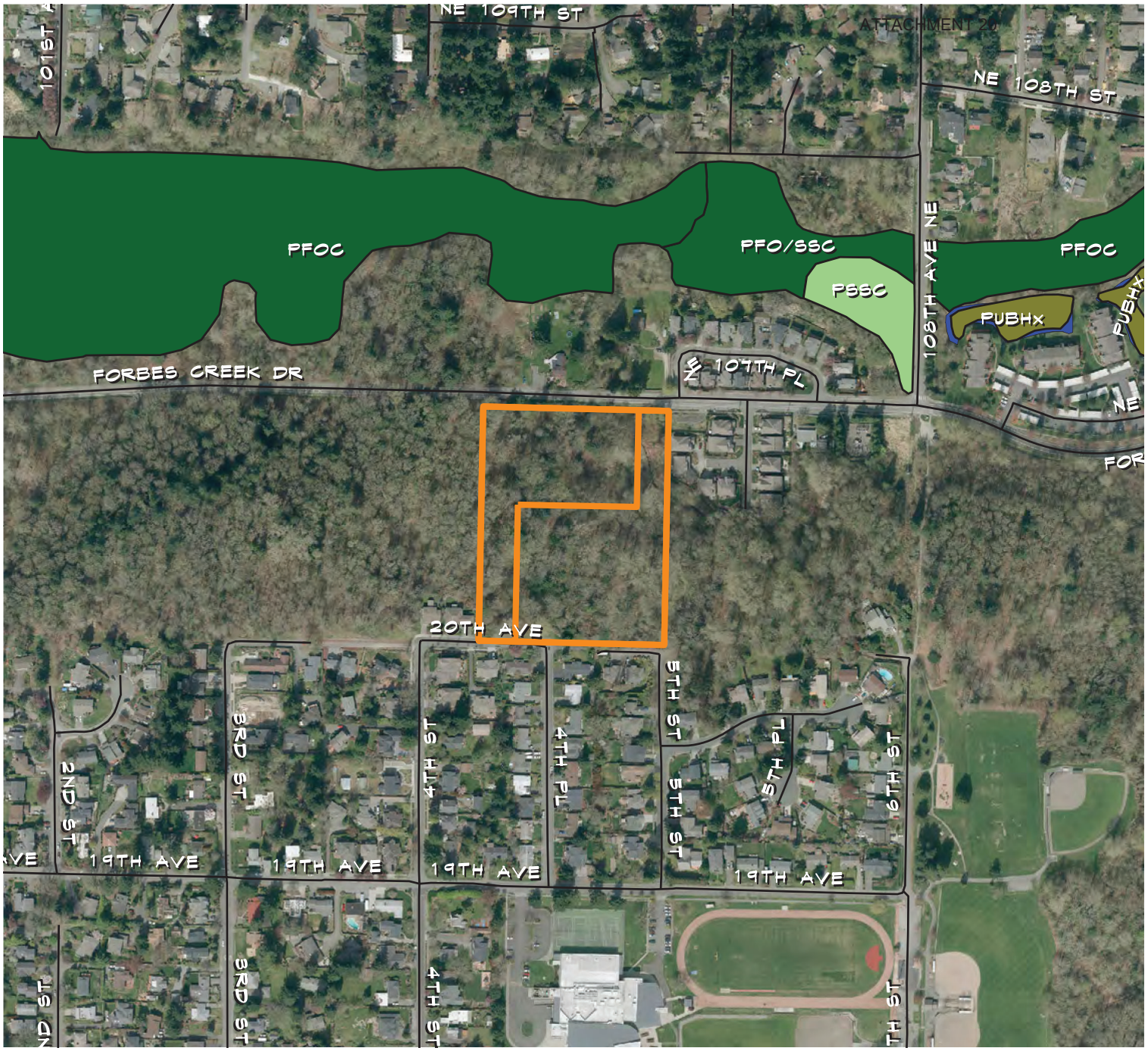
DESIGN	DRAWN	PROJECT
	DRT	518B

SCALE
1 in : 200 ft

DATE
30 MAR 2017

REVISED

2



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Reference: GIS parcel and road data from City of Kirkland, 2015. National Wetlands Inventory GIS data from USFWS, 2012. Aerial image 2012 from Earth Explorer, downloaded 2016.

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FIGURE 3

NWI MAP - KIRKLAND QUADRANGLE
ORCAS MOON PROJECT
KIRKLAND, WASHINGTON

DESIGN	DRAWN	PROJECT
	DRT	518B

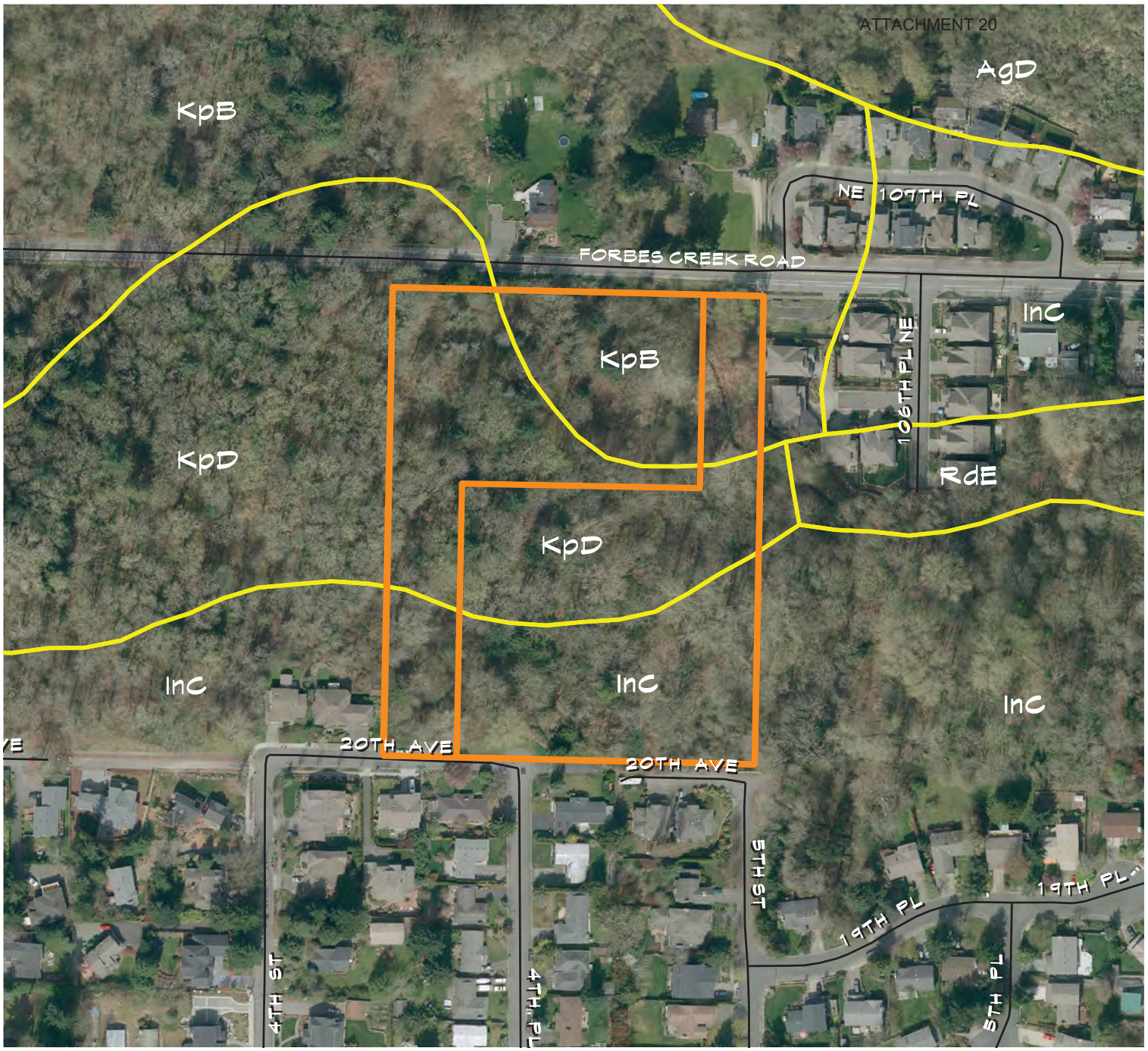
SCALE 1 in : 400 ft

DATE 30 MAR 2017

REVISED

3

435



SOIL KEY

AgD - Alderwood gravelly sandy loam, 15 to 30 percent slope
InC - Indianola lomay sand, 5 to 15 percent slope
KpB - Kitsap silt loam, 2 to 8 percent slope
KpD - Kitsap silt loam, 15 to 30 percent slope

N

Reference: GIS parcel, road, and soil GIS data from City of Kirkland, 2015. Aerial image 2012 from Earth Explorer, downloaded 2016.

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FIGURE 4

NRCS SOILS DATA
(from City of Kirkland)
ORCAS MOON PROJECT
KIRKLAND, WASHINGTON

DESIGN	DRAWN	PROJECT
	DRT	518B

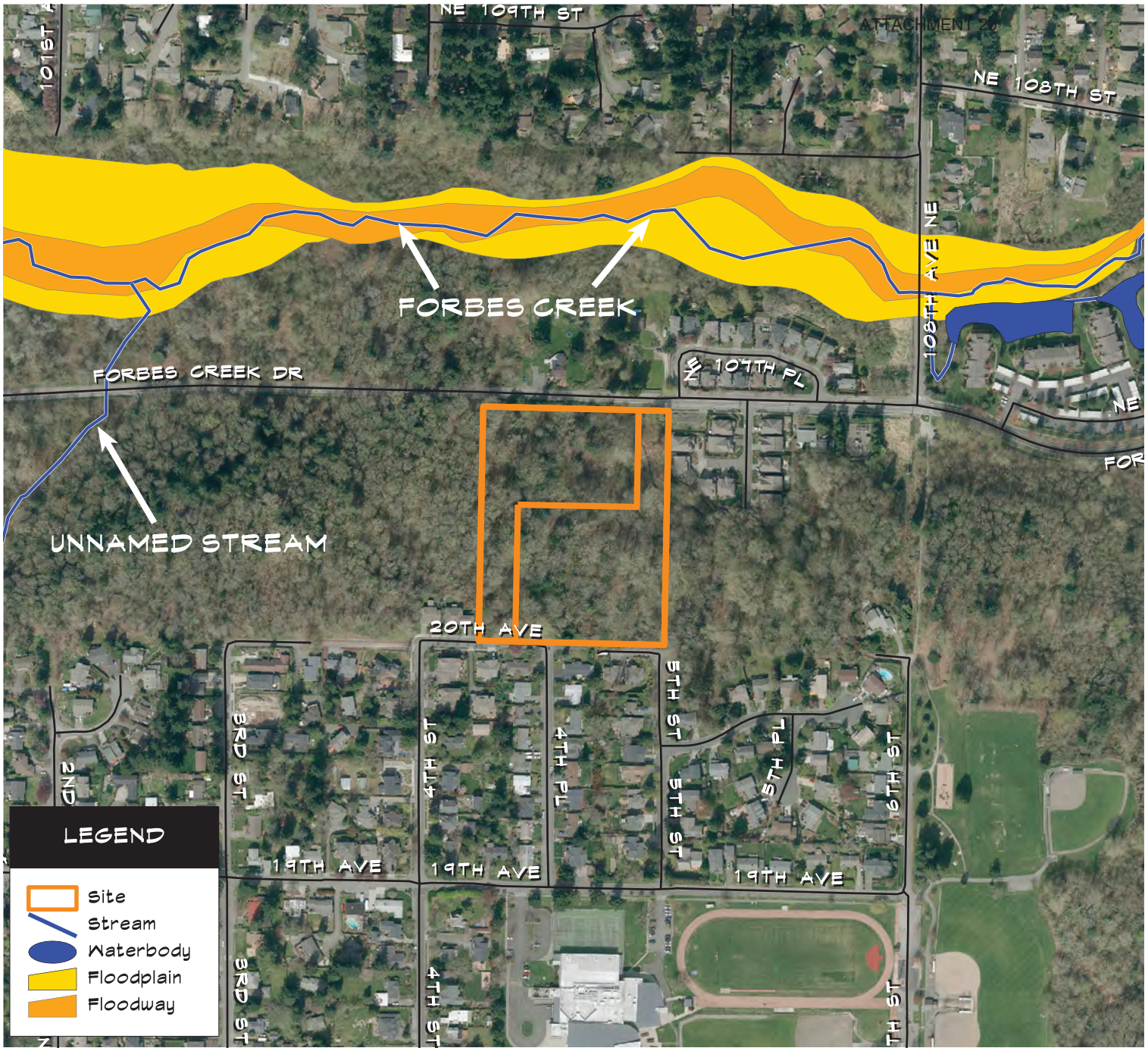
SCALE 1 in : 200 ft

DATE 30 MAR 2017

REVISED

4

436



Reference: GIS parcel and road data from City of Kirkland, 2015. Stream, water body, floodway, and floodplain data from King County GIS, 2015. Aerial image 2012 from Earth Explorer, downloaded 2016

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FIGURE 5

KING COUNTY CRITICAL AREAS GIS DATA
ORCAS MOON PROJECT
KIRKLAND, WASHINGTON

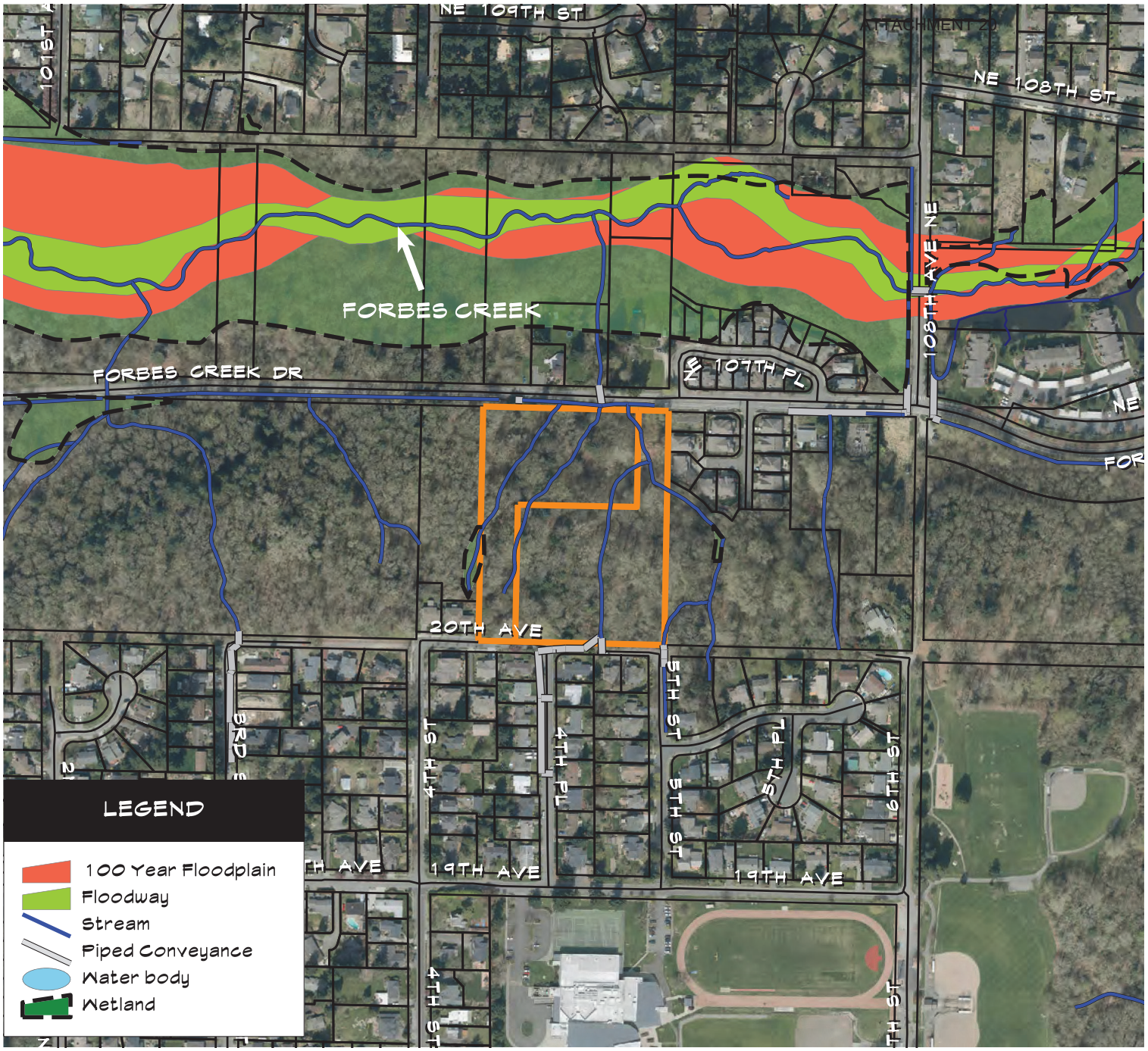
DESIGN	DRAWN	PROJECT
	DRT	518B

SCALE 1 in : 400 ft

DATE 30 MAR 2017

REVISED

5



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Reference: GIS parcel, road, stream, wetland, water body, floodplain, and floodway data from City of Kirkland, 2015. Aerial image 2012 from Earth Explorer, 2016.

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FIGURE 6

CITY OF KIRKLAND CRITICAL AREAS
GIS DATABASE
ORCAS MOON PROJECT
KIRKLAND, WASHINGTON

DESIGN	DRAWN	PROJECT
	DRT	518B

SCALE 1 in : 400 ft

DATE 30 MAR 2017

REVISED

6