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HEARING EXAMINER

PRELIMINARY PLAT – STAFF REPORT
Tibbetts Crossing

APPLICATION NO: PP18-00002

January 17, 2020

I. Application Information

Project Name:	Tibbetts Crossing
Staff Contacts:	Valerie Porter, Associate Planner Phone: 425-837-3094 Email: ValerieP@issaquahwa.gov Denise Pirolo, Senior Engineer Phone: 425-837-3092 Email: DeniseP@issaquahwa.gov
Property Owner:	Steve Burnstead Construction, LLC
Authorized Agent:	Leo Suver Steve Burnstead Construction, LLC 11980 NE 24th St Bellevue, WA 98005
Request:	Application for preliminary plat approval to subdivide a 21.94-acre site into 20 single-family residential lots. The project will provide two affordable housing units and create a tree retention tract. Site improvements will consist of an internal roadway with a bridge crossing, public trail, landscaping, stormwater, utility, and frontage improvements.
Parcel No.:	2924069041
Zoning:	Single Family-Estate (SF-E)
Comprehensive Plan:	Low Density Residential
Subarea:	Tibbetts Creek Valley

II. Site Conditions Description

The proposed site is 21.94-acres and is located on the east side of intersection NW Talus Drive and Renton-Issaquah Road SE (aka SR 900). The majority of the site is undeveloped and consists of tree stands and pasture. The parcel is bisected north to south by Tibbetts Creek. The topography on the eastern half of the site slopes downward to the west approximately 25%. The eastern portion of the site is undeveloped and consists of native forested vegetation.

The topography on the western half gently slopes down in the northeast direction between 5-10%. A single-family home along with several barns and outbuildings were once present on the western half of the site. To date, all structures were demolished in late 2018 after the Demolition Permit (DEM18-0009) was approved, except the barn. Undeveloped parts along the western portion of the site are pastured areas that are comprised of a mix of grasses (reed canary grass, bluegrass, and bent grass) and shrubs (cut-leaf blackberry and Himalayan blackberry).

Six wetlands and three streams are present on or within close proximity to the site. More information about the critical areas can found below under the Environmental Protection section of this report.

III. Surrounding Land Uses

North: Single-Family Residential and Squak Mountain Greenhouses & Nursery

South: Single-Family Residential

East: Single-Family Residential

West: Privately Owned Open Space

IV. Project Description

The applicant is proposing to subdivide the parcel into 20 single-family lots through a cluster housing development with on- and off-site guest parking, a private internal two-lane road connecting to SR 900, and two open space tracts. Two of the single-family lots will be designated affordable housing. The project will also construct frontage improvements along SR 900, which will begin at NW Talus Drive and end at the south end of the parcel. In addition to the 11.27-acres of critical areas and buffers, 6.26-acres of developable area will be placed in a native growth protection easement (NGPE). A project narrative is included as Exhibit 2 and the preliminary plat plans as Exhibit 1.

V. Public Notification

<u>Development Agreement</u>

Pre-application Meeting: February 11, 2015

Public Hearing - Development Commission Meeting: July 20, 2016

City Council's Land and Shore Committee: December 1, 2016

Development Agreement: Approved on December 19, 2016

<u>Preliminary Plat</u>

Neighborhood Meeting: November 5, 2018

Notice of Application to Property Owners within 300 feet: November 19, 2018

SEPA Comment Period: September 13, 2019 – September 27, 2019, and
December 13, 2019 – December 27, 2019

Public Notice Sign Posted: January 14, 2020

Notice of Public Hearing to Neighbors within 300 feet: January 14, 2020

Notice of Public Hearing: Published in the Issaquah-Sammamish Reporter January 17, 2020

VI. Review Process

The Issaquah Municipal Code (IMC) 18.04.490 states Preliminary Plats shall be reviewed through a Level 4 review process and the Hearing Examiner shall hold a public hearing and make the final decision.

After approval of a preliminary plat, the applicant may apply for a Site Work Permit to build the roads, lay the utilities, and grade the lots. After the site infrastructure has been installed or bonded for, and prior to recording the plat, a review of the final plat will occur by the City. After approval and recording, the applicant may apply for Building Permits for construction of single-family residences on individual lots, but some model homes may receive Building Permits prior to final plat approval.

VII. City Department Review

Application materials have been reviewed by City staff in the following departments: Fire, Building, Parks, Engineering, Public Works Engineering, and Public Works Operations. The project has also been reviewed by external partners like Recology. Comments by City staff and external partners have been incorporated into this report, and additional review will be required for construction permits.

VIII. Preliminary Plat Review

1. Comprehensive Plan and Zoning

As identified on Figure L-1 of the Comprehensive Plan, the site is designated as low density residential. The site is located in the Single Family-Estate (SF-E) zone of the Tibbetts Creek Valley subarea. The proposed single-family residential subdivision is consistent with the Comprehensive Plan low density residential designation and SF-E zone.

2. Subdivisions—IMC Chapter 18.13

The proposed subdivision is subject to the preliminary plat requirements of IMC 18.13 Subdivisions. Under IMC 18.13.060, a pre-application meeting is required, and it was held on February 11, 2015 (PRE15-00001). Under IMC 18.13.070, a public Neighborhood Meeting is required, and it was held on November 5, 2018. Per IMC 18.13.140, the Hearing Examiner shall conduct a public hearing prior to making a decision on a preliminary plat.

The applicant has applied for a Site Work Permit (SW18-00049) to stockpile soil on the site. This Site Work Permit does not allow for any clearing and grading. Only after approval of the preliminary plat will the applicant receive a Site Work Permit to build infrastructure and grade lots.

3. Development & Design Standards

The subject parcel is located within the SF-E zone and is regulated by the District Standards, which are outlined under IMC 18.07.360. The project is eligible to use Cluster Housing Standards, outlined under IMC 18.07.420, which are intended to preserve critical areas while achieving allowable density, provide more common usable and native forested open space, encourage affordable housing, and provide an efficient arrangement of development. Since the project is larger than five acres, a cluster housing Development Agreement approved by City Council is required. The City Council approved a Development Agreement in December 2016 that allows the parcel to be subdivided into the 20 single-family lots. The property's development is now governed by the provisions outlined in the approved cluster housing Development Agreement and the District Standards, which are outlined in detail below. The project's compliance is reviewed in greater detail below.

Development Standards	**Required**		**Proposed**
	SF-E	**Cluster Housing Provision**	
Maximum Density	1.24 dwelling units/acre		*.91 dwelling units/acre*
Minimum Lot Size	35,000 square-feet	No minimum for lots contained within the cluster; however, a minimum of 2-acres is required for a cluster development.	*Lot sizes range from 2,841 – 17,412 square-feet*
Front Setback	30-feet	Setbacks apply only to exterior site boundaries, where the zoning is different than the abutting zoning, shall be the greater of the setback required by the site's zoning or the setback required by the adjacent zoning. There are no minimum interior setbacks, except those established by other requirements, such as Building Code, easements, and critical areas.	*30-feet adjacent to SR 900*
Side Setback	15-feet		*15-feet+ adjacent to north and south lot lines*
Rear Setback	30-feet		*30-feet adjacent to east lot line*
Impervious Surface	30%	Impervious and pervious surface are equal to the underlying zone for the gross site, prior to subdividing or other actions. There are no minimum requirements for pervious and impervious ratios on individual lots within the cluster development.	*Individual lots unknown, reviewed with Building Permit for overall compliance with the gross site restrictions*
Pervious Surface	70%		*Individual lots unknown, reviewed with Building Permit for overall compliance with the gross site restrictions*
Base Building Height	30-feet	Building height equal to underlying zone.	*Unknown, reviewed with Building Permit*
Minimum Lot Width	135-feet	No minimum.	*Not applicable*

Residential Density

The gross site area is 21.94-acres. Density credits apply to all properties on which critical areas such as steep slopes, wetlands, and streams limit the land area available for development, per IMC 18.10.450. Density credits are calculated based on the percentage of the site in critical areas and associated buffers. Density credits transfer from the critical area to the developable area of the site. Density credits, and the Cluster Housing Standard, determine the allowed density in the developable area of the site.

There are 11.27-acres of critical areas and buffers present on the site. This equates to 51% of the total site area. IMC 18.10.450 allows a 50% density credit when 51-60% percent of a site is encumbered with critical areas. The allowed density on the developable area of the site is calculated as follows:

> Critical Area and Associated Buffer in Acres (11.27-acres) x Dwelling Units/Acre (1.24 dwelling units/acre) x Density Credit of 50% (.50) = *7 Dwelling Units*
>
> Acres Outside Critical Area and Associated Buffer (10.67-acres) x Dwelling Units/Acre (1.24 dwelling units/acre) = *13 Dwelling Units*

The allowed maximum number of dwelling units that can be present on the developable area of the site is 20 dwelling units. The project is not exceeding the maximum density allowed on the site and is complying with the Development Agreement and City Code.

Minimum Lot Size

The SF-E zone has a minimum lot size requirement of 35,000 square-feet. However, lot sizes may be reduced below the minimum per IMC 18.10.450 Density Calculations in Critical Areas, which states, "the applicant may reduce lot sizes below the minimum required for that zone to accommodate the transfer of density." In addition, IMC 18.07.420 Cluster Housing Standards, allows for no minimum lot size. The intent of these provisions is to provide allowances for preservation of critical areas and flexibility in design through clustering. Therefore, there is no minimum lot size for individual units within the development. Sheet C1.04 shows the various lots sizes, which range between 2,841 and 17,412 square-feet.

Setbacks

Per IMC 18.07.420 Cluster Housing Standards, setbacks apply only to exterior site boundaries and there are no minimum interior setbacks, except those established by other requirements, such as Building Code, easements, and critical areas. The conceptual plan is meeting setback requirements but will be review in more detail with construction permits.

Pervious and Impervious Surface

There are no minimum requirements for pervious and impervious ratios on individual lots within the cluster development. Pervious and impervious surface requirements of the overall development must comply with the District Standards for the SF-E zone. However, it is necessary to know how impervious surface is distributed to each lot for City review of individual Building Permits. Compliance with District Standards will be reviewed during the construction permit process. **[Condition 1]**

Affordable Housing

Per IMC 18.07.420 Cluster Housing Standards and the Development Agreement, two individual platted lots will be deed restricted for affordable housing and dedicated to the City. The recorded agreement shall be a covenant running with the land and shall be binding on the assigns, heirs, and successors of the applicant. The applicant will coordinate with City staff and the City's affordable housing partner, A Regional Coalition for Housing (ARCH), on general requirements that include, but are not limited to, location, tenure, size, occupancy availability, and pricing. **[Condition 2]**

The applicant is willing to build and sell the affordable houses and relieve the City of this responsibility. An agreement between the City and the applicant will be established to allow for this.

Nonmotorized Facilities in Single-Family Developments

Per IMC 18.07.081 Nonmotorized Facilities in Single-Family Developments, all new single-family developments of two or more lots must provide nonmotorized walkways within the development to link to schools, common areas, open spaces, transit stops, public streets, and/or existing pedestrian paths on adjacent parcels served by public streets. This requirement is intended to increase safe nonmotorized access and mobility, help remove pedestrian and vehicular movement conflicts, and support transportation options. The following are being proposed:

1. Road A: The applicant is proposing to construct a 2-lane road that will connect from SR 900 to the eastern portion of the lot, which include Lots 17-20. As shown on Sheet C4.31, a single 5-foot wide sidewalk will be provided along one side of the entire road. Road A creates nonmotorized walkways throughout the development and links residents to adjacent public streets. The road will be privately owned and maintained.

2. Regional Trail Connection: Per the Development Agreement, a 20-foot wide relocatable recreational trail easement through the homeowner's association (HOA)-owned open space must be given to the City by the owner to serve the neighborhood. The easement is for a Regional Trail, or trails, that must connect SR 900 to the eastern boundary and King County's Cedar-to-Sammamish Rivers Trail, and the northern and southern boundaries. A portion of the Regional Trail may meander through the open space tract to connect east to King County's Cedar-to-Sammamish Rivers Trail.

   Most of the trail will be used exclusively by nonmotorized users through and across the site. Sheet C1.04 in the plan set illustrates possible trail locations providing access to the site from SR 900 through the critical area buffers. The proposed trail is exclusive to pedestrians except where the trail converges at Road A to allow pedestrians to use the bridge. To ensure connectivity, it will also be the applicant's responsibility to provide transitions to and from the right-of-way, development, and future trail locations.

   A portion of the trail will be constructed by the applicant in order to meet the required 15% common usable open space requirement discussed below. The remaining trail segments will be constructed by the City at an unknown future date. The interior road and bridge are privately owned and maintained. Therefore, an access easement must be given to the City to allow for public use. **[Condition 3], [Condition 4]**

3. Common Useable Open Space/ Neighborhood Trail: Cluster developments are required to provide a minimum 15% of the net site area as common usable space. Per IMC, net site area is defined as the gross site area minus the area used for public or private roadways, dedicated right-of-way, easements and any area in special purpose overlay districts, critical areas and associated buffers.

   To comply with the 15% percent requirement, a minimum of approximately 1.47-acres (64,032.78-square-feet) of usable open space must be provided. City staff believes 1.47-acres is out of proportion and creates an unfair burden (nexus and proportionality) given that less than half of the developable land will be developed while the remaining 6.26-acres will be placed in a NGPE to remain forested land in perpetuity. Placing developable land in a protected easement is a benefit to the community and natural environment. As a more comparable requirement, City staff proposes the project be required to provide 15% of common usable space for the 4.41-acres of land that will be developed, which is more proportional to the size of the development. Enacting this requirement, the project will then be responsible for constructing 0.66-acres (28,815 square-feet) of common usable space.

   Common usable open spaces must be accessible for a variety of recreational uses including but not limited to trails, picnic areas, and other recreations. The applicant is proposing to have usable open areas dispersed throughout the entire development by way of tracts and trails. Tracts B, C, and D have been designated common usable open space tracts and a pedestrian trail will be constructed through critical area buffers, which will be available residents and the surrounding community. All proposed open space tracts are located on the west side of the development where 75% of the lots are located. The following is being proposed:

   - Tract B: Tract B is approximately 9,050 square-feet and is surrounded by Lots 1-13. According to the preliminary landscape plan, Tract B will be an open grass area surrounded by trees.
   - Tract C: Tract C is located across from Lot 1 on the northern end of Road A and is under 1,000 square-feet. The Preliminary Landscape Plan on Sheet L2.01 shows Tract C as being entirely vegetated with native shrubs, which makes this space unusable.
   - Tract D: Tract D is located to the north of Lot 14 and is providing approximately 3,715 square-feet of usable open space for recreational use. This tract will also house a below ground detention vault. A design for Tract D has not yet been proposed.

   The proposed design and uses of Tracts C and D do not meet the definition of "common usable open space" and must be redesigned to create accessible recreational opportunities for the development. **[Condition 5]**

   Alone open space Tracts B, C, and D do not fulfill the 0.66-acre common usable open space requirement. Per the Development Agreement, a Neighborhood Trail through the HOA-owned open space is also required. To comply with Code and the Development Agreement, the applicant will construct the east-west segment of the Regional Trail to connect to the eastern parcel boundary. Approximately 0.34-acres (14,985 square-feet or 2,997 liner feet) of trail must be constructed to fulfil the common useable open space requirement.

The site plan shows pedestrians entering the site from SR 900 and will be able to access the site on the southern end of the parcel, meander through the critical area buffers, converge with the sidewalk along Road A, and walk over the bridge to eventually connect with King County's Cedar-to-Sammamish Rivers Trail. The trail will also have a turn back through the development to serve the residents. This east-west segment of the Regional Trail and the turn back through the development fulfills the Neighborhood Trail requirement. Once the east-west trail is installed, residents and the surrounding neighborhoods will have a non-motorized throughway connecting the development to King County's Cedar-to-Sammamish Rivers Trail and allow residents to enjoy natural open space on the site. **[Condition 6]**

Sheet C1.04 shows that most of the future trail will be in the critical area buffers. Per IMC 18.10.610(B), construction of a public or private trail is allowed in wetland buffers if there is supporting documentation, such as a critical areas study, determining that there is no loss of buffer functions and values. The trail area located within the critical area buffers will be addressed by adding additional buffer area.

Details regarding the location, width, or materials of the pedestrian trail were not identified in the Development Agreement, but the Parks Department has expressed a preference for a 5-foot wide gravel trail. To assist with wayfinding, signs must be installed along the trail edge, and amenities, such as dog waste pick-up stations and picnic benches, are encouraged. As a community accessible Regional Trail, it is necessary that the public understands where the trail goes and who may use it. This is best accomplished with signage. All signs and accessory elements will be owned and maintained by the HOA. The proposed open space tracts, in addition to the east-west Regional Trail segment and turn back, satisfies the Neighborhood Trail and common usable space requirements. **[Condition 7]**

Parking

Per the Development Agreement, each individual lot is required to provide at least two on-site parking spaces. On-site parking locations have not yet been identified. Should parking be proposed in the driveway, which staff strongly encourages due to the limited number of guest parking stalls being provided, the length of the driveway must be sufficient enough to prevent vehicles from overhanging into the right-of-way. Overhanging into the right-of-way could encumber the woonerf and prevent emergency vehicles from successfully passing through the site when needed (Fire lanes must be 20 ft wide.). Therefore, driveways shall be at least 20-feet in length to allow parking. Per IMC 18.09.090, parking stalls must be 20-feet in length. In addition to on-site parking, the interior road servicing Lots 1-13 is intended to provide six parallel guest parking stalls along the park side of the woonerf. Other than on-street parking, building layouts, parking stall locations, and quantities have not been submitted for review, as this level of detail is not required at this stage. Layouts, locations, and quantities for on-site parking will be reviewed with construction permits. **[Condition 8]**

Recycling, Compost and Waste Containers

Building footprints and layouts were not submitted for review, which is acceptable at this phase. However, there are certain services the plat must address, such as waste collection. It is assumed waste containers will be located within each individual garage and not in a common shared location. Therefore, each garage needs to be designed to accommodate waste containers as well as vehicles, if cars will be parked indoors, and necessities not stored in the house to ensure compliance with minimum on-site parking.

Per Solid Waste Collection Design Standards, waste containers must be in locations to avoid nuisance issues with wildlife. It is encouraged for waste containers to be placed within each individual garage.

Landscaping and Tree Retention

Subdivisions in SF-E zone are required to retain a minimum of 30% of the total caliper of existing significant trees outside of critical areas and buffers. The site contains 10.67-acres of developable land. The applicant is proposing to remove 1,552.2 diameter inches of trees, which leaves approximately 71.4% of trees to be retained outside of critical areas and their buffers.

In addition to tree retention, each individual lot must maintain a minimum tree density of two significant trees per 5,000 square-feet. The development will also install street trees along Road A and landscaping must be planted along the woonerf. The applicant is proposing to install around 100 trees in the 4.41-acres of the developed site area. The subdivision must meet the cluster housing provisions outlined in IMC 18.07.420.B.5 and submit a landscape plan for City review and approval.

A conceptual landscape plan has been provided for review, but not at the level of detail needed to review the plan for compliance, which is acceptable because it is not required at this stage. A more detailed review will occur with the Landscape Permit. The conceptual proposal meets tree density requirements, but the landscape plan will be reviewed in detail with the Landscape Permit. **[Condition 9]**

Environmental Protection

The project is vested to the critical area regulations prior to December 28, 2016. Per the Development Agreement, the project is vested to the land use ordinances, policies, and regulations that were in place at the time the agreement was established.

There are six wetlands (labeled as Wetland A, B, C, D, E, and F on sheets C1.04 and C1.05) located on and within close vicinity of the site. Although the proposed development is avoiding direct impacts to the critical areas located on the project site, it will impact a portion of the associated buffers for a few of the wetlands. To mitigate impacts, the applicant is proposing to add buffer areas and enhance existing buffers. The impacts and mitigations are described below. Please see Exhibit 9 for further details.

Wetland A is a small wetland located north of the proposed private road along the edge of SR 900. This wetland is classified as a Category IV with a 40-foot buffer. There is currently a 20-foot asphalt road, which provides access to the site, intruding into the wetland buffer. The applicant is proposing to expand the entryway approximately 10-feet further into the buffer to construct a retaining wall, two 10-feet travel lanes, a 5-foot wide sidewalk, and a 5-foot landscape strip. Although the new road decreases the wetland buffer and encroaches into more than 25% of the critical area buffer, new buffer area is being added and the existing buffer will be enhanced.

Wetlands B, C, D, and E are each classified as Category III wetlands with a 50-foot buffer. Wetland B is in the northeast corner of the site and extends north off the site. Wetland C is associated with Tibbetts Creek and is located near the northern parcel line on the west side of the creek, which extends off the site further north. Wetland D is a small wetland also located on the northern parcel boundary, but on the east side of Tibbetts Creek. Wetland E is a linear wetland located on the southeastern portion of the site. The proposed development will not have any impacts to Wetlands D and E.

The project is proposing to construct two lots, Lots 15 and 16, in between Wetland B and C, which will encroach into portions of the wetland buffer. To offset the impacts to Wetlands B and C the applicant is proposing buffer averaging and adding new buffer area.

Wetland F is classified as a Category II wetland with a 75-foot buffer. Some of the buffer associated with this wetland will be encroached by development. The applicant is proposing to use buffer averaging to reduce the buffer.

In addition to wetlands, three streams (Tibbetts Creek, Stream A, and Stream B) are present on the site. All three streams are classified as Class 2 streams with salmonids and have 100-foot buffers. Tibbetts Creek bisects the site from north to south. The creek enters the site from the south and flows to the north. The stormwater outfalls of five of the proposed lot boundaries (Lots: 8, 9, 10, 11, and 16) will encroach into the stream buffer. Per IMC 18.10.775 Alternations to Streams and Buffers, stormwater facilities shall not encroach into stream buffers by more than 25% of the Standard stream buffer width. The preliminary stormwater plans comply with City Code but will undergo a more detailed review by City staff during the construction permit phase to determine the practicality of the outfall locations. The applicant is also proposing to construct a bridge over Tibbetts Creek. To mitigate stream buffer impacts, the buffer area lost due to development will be replaced and will not result in a net loss of stream function.

Both Stream A and B are tributaries to Tibbetts Creek and are located on the southern end of the parcel. Stream A flows from the west to the east and Stream B enters the site from the east and flows west until it meets Tibbetts Creek. The proposed development will have a minimal impact on the buffer of Stream A. To mitigate the impact, and comply with Code, the applicant is proposing to average the buffers of Tibbetts Creek, and Stream A. The proposal is not intended to impact Stream B and its associated buffer. This critical area will remain in its current state.

Per IMC 18.10.650 Environmental Protection, wetland buffers will be reduced by a maximum of 25% with enhancement of the reduced buffer areas. In areas where development is encroaching critical area buffers, buffer width averaging is being proposed. Overall, the proposal shows a reduction of 6,827 square-feet of buffer and an addition of 22,110 square-feet. The project will impact 7,530 square-feet of buffer and intends to enhance 1,000 square-feet of the existing buffer.

A pedestrian trail is proposed in the critical area buffers. The final location has not yet been determined and its impacts to the buffer have not yet been incorporated. The applicant is proposing to convert approximately, 6,345 square-feet into buffer area to offset the trail impacts. If this add is enough to mitigate the potential impacts on the critical area caused by the trail will be evaluated in greater detail with the construction permits.

Per the Cluster Housing provision, IMC 18.07.420, if critical areas are present, such sensitive areas and associated buffers must be placed in a NGPE. The site contains approximately 11.27-acres of critical areas, which include wetlands, streams, steep slopes and associated buffers. All critical areas will be placed in a NGPE to ensure protection of critical areas in perpetuity. To guarantee critical areas are properly restored in a timely manner and homeowner understand critical areas are not to be encroached upon, all critical areas must undergo the necessary enhancements prior to building occupancy. **[Condition 10]**

Of the 21.94-acre site, approximately 10.67-acres (464,785.2-square-feet) is buildable land. Only 4.41-acres (192,099.6-square-feet) will be developed, which leave 6.26-acres (272,685.6 square-feet) of undeveloped buildable area. The remaining 6.26-acres of buildable land will remain undeveloped and preserved as a NGPE to maintain the forest function. All open space tracts will be owned in common by the subdivision and encumbered by a NGPE. **[Condition 11]**

The City's third-party consultant reviewed the critical area study and plan set. The review confirmed the applicant's delineation of the wetland and stream boundaries, wetland rating, and wetland buffer widths to the vested Critical Areas Code. The proposed enhancements referenced in the study involve removing all invasive plants and planting native trees and shrubs. Proposed buffer enhancements will moderate stormwater runoff, reduce soil erosion potential, and provide quality habitat for wildlife to perch, find refuge, and native food sources. As confirmed by the third-party consultant, the proposed buffer alterations comply with City Code and will not adversely impact the function or value of the critical areas. City staff agrees with the assessment and concludes the proposal complies with City Code. A more detailed review of mitigation measures will be reviewed during the construction permit phase.

<u>Floodplain</u>
The project site contains Special Flood Hazard Areas (SFHA) around Tibbetts Creek. Per IMC 16.36.130 Specific Standards (Zone AE), development proposals shall not reduce the effective base flood storage volume of the floodplain and shall not reduce the hydraulic capability of the floodplain on-site to convey floodwaters through the property during the base flood event. When the development results in the displacement of floodwater, a Flood Hazard Permit is required. The Flood Hazard Permit shall include a certification by a licensed civil engineer registered in the State of Washington that compensatory storage is provided, and the hydraulic capability of the floodplain is preserved on the site and it will convey floodwater through the property without affecting adjacent properties, in accordance with IMC 16.36.130 and 16.36.140. The location of compensatory storage must not adversely impact critical area buffers.

The proposed access road, the bridge over Tibbetts Creek, and the new outfalls to Tibbetts Creek are currently shown within the SFHA. City staff continues to discuss the bridge design specifics with the applicant. The bridge design should demonstrate, but is not limited to the following:

a. Spans outside the ordinary high-water mark.
b. Is adequate for high flows.
c. Meets the required minimum bridge clearance of 3-feet above the 100-year flood water surface.
d. Does not encroach into the 100-year floodplain; unless the bridge design demonstrates the structure will cause "No-Rise" in base flood elevation.
e. Bridge length must account for lateral channel movement (meandering) that will occur in the bridge's life.
f. Prevent excessive backwater rise during floods that might lead to scour of the stream be within the waterway or deposition of sediment upstream. Scour or deposition of sediment may increase lateral shifting of the river channel and require armoring of the bank in the future.
g. Quantify the enhancement planting relative to the stream buffer impact.

Any required flood conveyance and/or storage related mitigation will be determined under the Flood Hazard Permit review process. **[Condition 12], [Condition 13]**

Transportation Circulation and Transportation Concurrency

A limited traffic analysis was submitted to the City for review, which evaluated traffic impacts, trip generation, sight distance, and turn lane warrants. The traffic analysis concluded the number of trips did not meet the minimum threshold for a full traffic impact study and concluded a right-turn-only lane is not warranted. Please see Exhibit 11 for further details. City staff have reviewed the documentation and agree with the assessment.

The project meets the requirements of IMC 18.15 Transportation Concurrency Management. The applicant submitted a transportation concurrency application (CON19-00006) in accordance with IMC 18.15.260. The proposed vehicle internal trip ends, minus any credits for existing trips, results in 19 PM peak hour trips. This number of vehicle internal trip ends falls within the available capacity in the citywide Trip Bank. Additionally, the development type, size, and location are consistent with the City's land use forecasts used for concurrency modeling and determination of the Trip Bank capacity. Therefore, the proposal is consistent with Concurrency Codes.

Site Access and Frontage Improvements

Per Street Standard, street frontage improvements are required for all new developments. The applicant has submitted four requests to deviate from the Street Standards for all internal roads and frontage improvements. Per the City Street Standards, the City Engineer or designee may approve deviations to the Standards herein after consultation with affected City departments. All proposed deviation requests have been reviewed, deemed to meet the criteria, and approved by the City following an interdepartmental review. Below is a description of the roads and four deviation requests:

1. Road A: Primary access to the site will be gained from a new privately-owned street, which connects to SR 900, meanders through the site, and provides access to four lots on the east side of Tibbetts Creek. All interior roads within the development should be designed to City Street Standard Details No. T-11 Typical Public Local Access Street. The Street Standard consists of two 10-foot travel lanes with one 5-foot sidewalk and one 5-foot planting bed on each side of the road. The applicant is proposing to construct two 10-foot travel lanes, with a 5-foot sidewalk and a 5-foot planter along only one side of the road; this deviation has been approved by the City. The request is intended to reduce impacts to adjacent critical areas and associated buffers by reducing the road encroachment while maintaining the 20-foot wide travel lane needed for emergency vehicle access.

2. Road A Bridge Crossing: Road A is shown extending over Tibbetts Creek by a bridge, along with a new outfall to the creek (after detention and treatment). The bridge will provide pedestrians and vehicles access to Lots 17-20 and act as a connection point for the Regional Trail. The road section, which can be viewed on sheet C4.31, will consist of two 10-foot travel lanes, a 5-foot sidewalk on one side, and two concrete traffic barriers on each side of the road, which is also a deviation from City Street Standard Details No. T-11. The bridge will be owned and maintained by the homeowner's association. The applicant requested eliminating the planter strips and one sidewalk to reduce road width and lessen the impact to the critical area and associated buffer, which the City approved.

The bridge and new outfall are proposed within a portion of the stream channel. Therefore, the project will require Hydraulic Project Approval (HPA) from the Washington State Department of Fish and Wildlife (WDFW), per state WAC220-660-040. **[Condition 14]**

3. Woonerf: In addition to Road A, the proposal shows a road providing access to Lots 1-13. The applicant has requested a deviation from the Street Standards to construct a woonerf, which has been approved administratively. Woonerfs are designed to accommodate vehicles but emphasize pedestrian use. Code regulating woonerfs can be found in the Talus Replacement Regulations. The City Street Standards do not discuss woonerfs, but the Talus Urban Village that is located across SR 900 includes woonerf standards, which the applicant requested to use for this project. The applicant is proposing to construct two 10-foot travel lanes at grade with an 8-foot wide parking stall area on one side of the road. Driveways will connect to the woonerf. The approved deviation allowed for the use of the Talus woonerf standard outside of the Urban Village. **[Condition 15]**

4. SR 900 Improvements: The development is only showing frontage improvements along the south side of the entryway. Frontage improvements north of the entryway have been waived by the City because of the cantilevered bridge and pedestrian safety as a result of limited sidewalk along the east side of SR 900. The applicant will be required to provide a sidewalk and landscape strip south of the entry road. These improvements shall consist of curb, gutter, landscape, and sidewalk.

The entrance to the plat will be gained from the intersection of NW Talus Drive and SR 900. To allow access from the opposite side of the road (east/west connection), the existing signal must be modified. New projects are also under review across SR 900 within the Talus Urban Village. To ensure signal modifications are suitable for both projects, work must be coordinated. To prevent traffic congestion, adequate access signal alterations must coincide with the development.

Per City Street Standards, the timing when required street improvements should be installed depends on the significance of the development's impacts to roadway and intersection operational performance, safety, specific access and site circulation needs, neighborhood impacts, impacts on pedestrian and transit facilities, or as required by other City Ordinances. SR 900 contains high traffic volumes and currently does not have a sidewalk on the east side. Per IMC 18.07.081 Nonmotorized Facilities in Single-Family Developments, safe accessible passage to and from the site is required. While some homes may be constructed and occupied prior to completing frontage improvements, the improvements should not wait for full buildout as with each home's occupancy more pedestrians and bicycle trips to and from the site may occur. Required frontage improvements will provide bicycle and pedestrian access along SR 900, and must be in place by the 10th single-family home.

SR 900 is owned and maintained by Washington State Department of Transportation (WSDOT), and therefore, the applicant must coordinate with WSDOT and City staff on all street improvements impacting SR 900. **[Condition 16]**

Lighting

An illumination plan was not submitted to the City for review. Site lighting is not only functional and addresses safety, but as a visual element lighting also plays a role in shaping neighborhood character. Light fixtures and placement will be reviewed with construction permits. Lighting levels shall be functional, provide adequate lighting for public safety, and promote energy conservation.

In addition, lighting must protect adjacent uses, natural areas, pedestrians, and/or vehicular traffic from excessive spillover light and glare generated by exterior building lighting. Per IMC 18.07.107 Outdoor Lighting, light spillover is limited to 0.3 footcandles at the beginning boundary of all critical area buffers to help avoid unintended light impacts to environmentally critical areas and at all property lines. **[Condition 17]**

Stormwater

According to the Development Agreement, the project is required to comply with the 2009 King County Surface Water Design Manual (KCSWDM) along with the City of Issaquah 2011 Addendum, which together identify the requirements for the storm water detention, treatment and conveyance systems. Conservation Flow Control Standard, using full forested as the pre-developed condition, is required for both public and private runoff from all "net new" impervious surface area. Runoff routed to Tibbetts Creek from pollution generating impervious surface (PGIS) areas requires the Standard Sensitive Lake Water Quality Treatment (reduction of solids and phosphorus).

Compliance with storm flow control and treatment requirements is achieved through a combination of detention/treatment vaults, bioretention, infiltration, and dispersion techniques. The specific way the storm water design will comply with Code requirements is still under discussion with the applicant. Additional soil and groundwater level testing will be performed to verify adequate soil and ground water conditions for infiltration areas prior to issuance of construction permits. If infiltration is found to be infeasible in certain areas, other storm water flow control and treatment options can be designed for this site. **[Condition 18], [Condition 19]**

Infiltration trenches receiving runoff from areas other than single-family roofs must be designed to meet requirements of Underground Injection Control (UIC) wells and be registered into the UIC Program (per Chapter 173-218 WAC). **[Condition 20]**

The proposed storm conveyance system shall be designed with enough capacity to convey and contain runoff from the site. All on-site storm facilities will be privately maintained.

Utilities

As required by Code, domestic and fire protection water will be supplied by a looped water main with connections to the City water system within SR 900. Typically, water meters are located within the parcel it is servicing. To avoid the water main being placed under the stream and wetland, the applicant has proposed placing the water meters for Lots 17-20 on the west side of the bridge in Tract D. The design will be reviewed in greater detail with construction permits. Water supply to Lots 17-20 will be privately owned supply lines serving each of the lots. With the road being private and the utilities being public, the City will require an access easement to allow City staff to service and maintain utilities on the site**. [Condition 21]**

Based on site conditions and critical areas, the 2017 AESI Geotechnical Report recommends that all clearing and grading activities be performed during the seasonally drier period. **[Condition 22]**

A preliminary sanitary sewer plan is shown on sheet C4.01 and C4.02. Sanitary sewer service is regulated by the Development Agreement, the City of Issaquah Public Works Department Developer Extension Agreement "Sewer" dated 1988 and revised 2005, City Code, and the Department of Ecology Criteria for Sewerage Works Design.

The submittal was reviewed for compliance with these documents and Standards, and for compliance with the usual and customary engineering design principles. The conceptual plan is feasible but will be reviewed in greater detail with the Site Work Permit. **[Condition 23],**

Sewer service is available to the project from a City-owned and operated collection system in SR 900. There is enough capacity in the existing collection and conveyance system for all the sanitary sewage that is anticipated from the application.

The application proposes to make a new connection to the existing sewer system in SR 900 at the plat entrance. It is anticipated that the gravity portion of the sewer system serving Lots 1-14 will be public, although Lots 10-14 incorporate a private grinder pump system for the lower pad. The grinder pump system serving homes on Lots 10-14 will be privately owned and maintained. Lots 15-20 will be served by private individually owned and maintained grinder pump systems along with a private 2-inch force main which will connect to the public system in Road A. It is anticipated that the sewer connection can be made while the existing sewer is in-place and operational. **[Condition 24]**

The current sewer proposal shows all elevations in the application can be served by the existing City sewer collection system. It is anticipated that the private sewer improvements in the application will be owned and operated by the applicant or their designated assignee, while the proposed sewer main which serves the woonerf will be owned and operated by the City.

The application does not include information on pipe slopes, but all pipes must meet the minimum slope criteria listed in the Public Works Standards and the Ecology manual. The minimum slopes, which presumably will be designed for full-buildout conditions, may be in-service during partial-build-out conditions. The pipes may experience flows that are substantially less than what they were designed for during partial-buildout conditions. City staff has experience with these partial-buildout conditions and the effect they can have on sewer pipelines. The effects of low-flows must be examined, and the design must mitigate both the lower than expected pipe velocities resulting from these conditions and the longer-than anticipated residence times in the pipelines. **[Condition 25]**

A preliminary geotechnical study has been completed for the site and it is expected that some challenging site conditions will be encountered during sewer pipeline design and construction. These include:

1. high groundwater levels (possibly submerging the completed pipelines)
2. potentially weak soils with lower than expected bearing capacities
3. site liquefaction during an earthquake

These three conditions can impact the design and the construction of sanitary sewers that rely on uniform pipe slopes and these conditions can be exacerbated by pipelines that are installed at minimum or near-minimum pipe slopes. In addition, the geotechnical report does not provide recommendations for pipeline design and construction, other than the notes in section 6.3—Liquefaction, of the Associated Earth Sciences, Inc. Engineering Report:

> "In our opinion, buried utilities should be constructed with flexible joints where they enter the new building additions to limit the risk of water, gas, and other potentially hazardous pipe ruptures."

While it is not unusual during the Preliminary Plat phase to make broad assumptions about site conditions and the possible solutions, the utility design and construction phases of this project should be particularly mindful of the groundwater, liquefaction, and potentially weak soils that might be encountered during utility design and construction.

It is presumed that except for any special design considerations needed to accommodate minimum slopes, weak soils, high groundwater, or liquefaction, that all sanitary sewer facilities will meet current Public Works Standards and applicable City Codes. **[Condition 26]**

4. Washington State Subdivision Law

The criteria for review of a preliminary plat are set forth in RCW 58.17.110 as follows:

Approval or disapproval of subdivision and dedication – Factors to be considered – Conditions for approval – Finding – Release from damages.

(1) The city, town, or county legislative body shall inquire into the public use and interest proposed to be served by the establishment of the subdivision and dedication. It shall determine: (a) If appropriate provisions are made for, but not limited to, the public health, safety, and general welfare, for open spaces, drainage ways, streets or roads, alleys, other public ways, transit stops, potable water supplies, sanitary wastes, parks and recreation, playgrounds, schools and schoolgrounds, and shall consider all other relevant facts, including sidewalks and other planning features that assure safe walking conditions for students who only walk to and from school; and (b) whether the public interest will be served by the subdivision and dedication.

(2) A proposed *subdivision and dedication shall not be approved unless the city, town, or county legislative body makes written findings that: (a) Appropriate provisions are made for the public health, safety, and general welfare and for such open spaces, drainage ways, streets or roads, alleys, other public ways, transit stops, potable water supplies, sanitary wastes, parks and recreation, playgrounds, schools and schoolgrounds and all other relevant facts, including sidewalks and other planning features that assure safe walking conditions for students who only walk to and from school; and (b) the public use and interest will be served by the platting of such subdivision and dedication. If it finds that the proposed subdivision and dedication make such appropriate provisions and that the public use and interest will be served, then the legislative body shall approve the proposed subdivision and dedication. Dedication of land to any public body, provision of public improvements to serve the subdivision, and/or impact fees imposed under RCW 82.02.050 through 82.02.090 may be required as a condition of subdivision approval. Dedications shall be clearly shown on the final plat. No dedication, provision of public improvements, or impact fees imposed under RCW 82.02.050 through 82.02.090 shall be allowed that constitutes an unconstitutional taking of private property. The legislative body shall not as a condition to the approval of any subdivision require a release from damages to be procured from other property owners.*

The proposed preliminary plat meets the "factors to be considered" and requirements of RCW 58.17.110. The plat includes appropriate provisions for utilities, (potable waters supplies, sanitary wastes), streets, open spaces, and drainageways. Impact fees will be required with the Building Permits for parks and recreation, schools, traffic, fire, general government, police, and bicycle and pedestrian facilities. Sidewalks will provide safe walking routes to school bus stops.

Appropriate provisions are made for public health, safety, and general welfare. The public use and interest will be served by the platting and dedication.

5. Impact and Mitigation Fees

Impact fees are required for each new single-family residence. The following impact fees will be required, and the applicable cost calculated at the time of issuance of Building Permits for each residential unit:

- Impact Fees: Transportation, Fire, Schools, Parks,
- SEPA Mitigation Fees: General Government, Police, and Bicycle & Pedestrian **[Condition 27]**

IX. SEPA Review

On July 15, 2016, the Development Services Department determined that the proposed cluster development does not pose significant adverse environmental impacts. An additional SEPA review to evaluate critical area impacts, traffic, and other elements is required as part of the Preliminary Plat.

The SEPA Responsible Official designee has reviewed the proposal for probable adverse environmental impacts and has issued a mitigated determination of non-significance (MDNS) on January 10, 2020. **[Condition 28]**

X. Public Comments

Public notice was provided in accordance with IMC Chapter 18.04.180 (See Section V – Public Notification). Public comments were received after the Neighborhood Meeting and mailed Notice of Application. The City received written comments, which included concerns regarding tree preservation, erosion, and impacts to the surrounding properties. The following is a summary of the public comment and staff response. All public comments received can be reviewed under Exhibit 17.

- Comment: An adjacent business owner is concerned the new development will create light pollution and provide access to surrounding parcels, which may lead to theft. The property owner is requesting street lights and other permanent lighting be designed in such a way that lighting does not flood onto adjacent parcels. There is a request to install fencing along parcel boundaries and parking provided by the development be designed in a manner to limit individuals from parking in the subdivision and walking to adjacent parcels.

  Response: *Illumination plans were not submitted with the preliminary plat submittal. All lights within the development will be required to meet lighting Standards outlined in the IMC and Street Standards and will be reviewed for compliance during the construction permit phase. The applicant is not proposing driveways or drive aisle that would lead to surrounding parcels.*

- Comment: The proposed project is in direct contrast with the Central Issaquah Plan, does not meet the Tree Code, and poses a potential landslide risk.

  Response: *The subject parcel is not located with the Central Issaquah Plan boundary, and therefore, the project is not required to meet the Central Issaquah Plan. A conceptual landscape plan was submitted for review. Parcels located within the SF-E zone are required to retain a minimum of 30% of the total caliper of existing significant trees outside of critical areas and buffers. The site is retaining 71%, which exceeds the minimum tree retention requirement.*

Please see Section 8 above for additional details. Steep slopes, which are 40% slopes or greater, are not present in the areas where development will occur.
In the event steep slopes are identified in areas where development will occur, the submitted plans will be reviewed by the City and a third-party consultant for compliance with all applicable Codes and regulations.

- Comment: The subject project will create an opportunity to provide a necessary Regional Trail connection between the Cedar River Trail and the East Lake Sammamish Trail. King County Parks respectfully requests dedication of an easement to connect the property currently owned by King County to the parcel to the south (PIN 3224069032) in a manner that would allow for future trail development.

  Response: *The Applicant will work with King County in coordination with the City to establish an access easement. Additional discussions will need to occur with King County and adjacent property owners in order to obtain property not part of the subject parcel.*

XI. Conclusion

The proposed preliminary plat is consistent with the Issaquah Comprehensive Plan, Land Use Code, and other applicable development regulations. The proposal meets the approval criteria of the City's Subdivision Code, IMC 18.13, and Washington State Subdivision Code, RCW 58.17.110. The project, as reviewed above and conditioned below, provides appropriate provisions for the public health, safety, and general welfare.

XII. Administration's Recommendation

The City of Issaquah Administration recommends **APPROVAL** of the Tibbetts Crossing Preliminary Plat, PP18-00002, and subject to the following conditions:

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1 Upon submittal of the final plat, an impervious surface table must be submitted to the City for review and approval, which shows the maximum square footage of impervious surface allowed and its allotment to lot as well as in common tracts such as street, trails, and park spaces. This document must also demonstrate how the proposal does not exceed the impervious surface limitation for the site. All Building Permits for each individual lot must identify the total amount of impervious surface being proposed in the permit as well what allotment is provided for future construction, if any, consistent with the approved table in the final plat. The table will be reviewed with the final plat and construction permits for each lot and tract.

2 Per the Development Agreement, the Owner shall record a deed restriction or covenant by which the two affordable housing parcels shall only be made available for (a) Affordable Housing, as defined in IMC 18.21.020 or, (b) housing for persons with disabilities; the choice between the options is solely at the discretion of the City. The applicant shall work with A Regional Coalition for Housing (ARCH) and City staff to write and record a deed restriction or covenant to implement this aspect of the Development Agreement prior to approval of the final plat.

3 The final plat shall show a non-motorized access easement granted to the City to allow for public use of the private bridge to gain access to the future trails. Maintenance of the easement area is the responsibility of the HOA. The easement language and location will be reviewed with final plat.

4 The final plat drawings shall show a relocatable easement for the Regional Trail that will connect east-west (SR 900 to the eastern boundary and King County's Cedar-to-Sammamish Rivers Trail) and north-south (between the property's north and south boundaries). The easement will be granted to the City, though the trail will be maintained by the HOA. This will be reviewed and approved by City Council prior to submittal of the final plat.

5 With submittal of the Site Work Permit, the design of HOA owned tracts shall be revised to provide at least 15% of the developable area (approximately 0.66-acres) as common usable open space. This may include, but is not limited to, trails, picnic areas and other recreation areas. The final plat will indicate which tracts include recreation as an allowed use for future reference.

6 To comply with the common usable open space requirement, the applicant must construct a portion of the Regional Trail connection. The applicant would be responsible for enough trail length to complete the common usable open space requirement. The City will review and approve the trail location, width, and construction material for compliance with applicable Codes. This will be reviewed with the Site Work Permit.

7 Adequate wayfinding signs must be installed throughout the development to identify the presence of the trail. This will be reviewed with construction permits. If signs are to be located on individual lots, easements to the City for the sign location on private property and to the Homeowner's Association for their maintenance and replacement will be required.

8 On-site driveways shall be at least 20-feet in length or more, where driveway parking is allowed.

9 A final landscape plan must be submitted for City review and to demonstrate the project's compliance with various Code provisions. This will be reviewed with the Landscape Permit.

10 Certain authorized activities may be allowed to impact the critical area buffers. Prior to issuance of building occupancy of the 16th unit, grading or construction impacts to adjacent critical area and associated buffers must be restored (i.e. installed and accepted).

11 The final plat must identify use, ownership, and maintenance responsibilities for all tracts and easements including NGPEs.

12 An approved Flood Hazard Permit is required prior to issuance of construction permits, except a Demolition Permit.

13 The bridge over Tibbetts Creek must demonstrate compliance with the Washington Department of Fish and Wildlife (WDFW) Water Crossing Design Guidelines, FEMA floodplain guidelines, Critical Area Code, and any other applicable regulations and standards. The bridge will require a Building Permit, but the bridge design must be submitted with the Site Work Permit for site infrastructure, which will be when compliance with this condition will be confirmed.

14 A Hydraulic Project Approval (HPA) from the Washington State Department of Fish and Wildlife (WDFW) is required for the proposed pedestrian and vehicular bridge over Tibbetts Creek and new storm outfall to the creek. The HPA must be submitted to the City for review prior to issuance of Flood Hazard and Site Work Permits.

15 The woonerf shall meet the requirements outlined in the Talus Replacement Regulation under IMC 18.19C.250 Woonerf Standards. Road sections will be reviewed in detail with the Site Work Permit and any provisions relating to easements or other non-construction elements will be reviewed with Final Plat.

16 The existing signals at NW Talus Drive & SR 900 must be modified by the owner to accommodate access to the subdivision. Signal modifications must be coordinated with concurrent development (i.e. Talus Middle School) within close vicinity of the project site. All required SR 900 frontage improvements must be in place prior to occupancy of the 10th Building Permit. Where possible, a sidewalk and planter strip should be added to the SR 900 frontage, south of the plat entry. The applicant will be required to obtain the necessary WSDOT permits in addition to City construction permits. This will be reviewed with construction permits for Site Work and Building.

17 A lighting photometric plan shall be provided for the project site and right-of-way lighting. The lighting levels shall comply with IMC 18.07.107 and shall provide an adequate amount of illumination for the intended use. Staff encourages lighting to be scaled to pedestrians and not exceed 15-feet in height. Lighting shall be designed so there is no light spillover into critical areas, which is defined as 0.3 footcandles.

To facilitate review of the lighting, a photometric calculation, stamped by a professional engineer, showing illumination levels on the pavement shall be submitted with the Site Work Permit for construction of lighting. A point-by-point calculation is required. The illumination calculation shall include all fixtures that contribute light to the site (poles, bollards, building mounted lighting). Low wattage decorative fixtures such as sconces or porch lights can be excluded from the calculation. No up-lighting is allowed.

18 Code compliant storm infiltration, bioretention, and dispersion elements must:

a. Be evaluated and supported in writing by a geotechnical professional
b. Be located outside of all floodplain and other critical areas (including devices and required flow path)

19 Areas to be used for infiltration and/or bioretention of storm water must be protected from compaction and sedimentation during construction activities. If stockpiling or other construction activities occur in these areas, removal of 6-inches of sediment and loosening soils to 18-inches below the proposed grade is required prior to installation of infiltration facilities. This will be reviewed with the Site Work Permit to allow the facility's construction.

20 Infiltration trenches receiving runoff from areas other than single family roofs must be designed to meet requirements of Underground Injection Control (UIC) wells and be registered into the UIC Program (per Chapter 173-218 WAC). This will be reviewed with the Site Work Permit.

21 All internal roads will be privately owned and maintained by the HOA with access granted to the City via recorded easements where needed for utility maintenance. This will be reviewed with the final plat.

22 Clearing and grading activities must be performed during the seasonally drier period, which in Issaquah is between April 30th and October 1st. If work during the wet weather season is desired, additional geotechnical information demonstrating compliance with IMC 16.26, and in particular 16.26.050, must be provided to the City which demonstrates work can be conducted consistent with the peer reviewed geotechnical report and City codes.

23 Special design consideration must be given to the potential for high groundwater, liquefaction and weak soils and their impacts on the on-site sanitary sewer system. The special design considerations must be summarized in a report that accompanies the sanitary sewer design and must be submitted with, or before, utility permit submittal. This condition will be enforced during Site Work Permit review and approval.

24 During utility and site construction, the existing sanitary sewer pipelines in SR 900, and any other sewer pipelines that provide service to properties other than Tibbetts Crossing, must remain in-service and operational. This will be reviewed with the Site Work Permit.

25 Additional information and review of sewer system for compliance with detailed construction level aspects such as minimum slopes and other elements of the City Sewer Standards. This will be reviewed with the Site Work Permit.

26 All sanitary sewer designs and construction must comply with existing City Codes and Standards.

27 Impact and mitigation fees are required for each new single-family residence. The applicant will receive credit for the single-family dwelling that existed on the site. The following impact fees will be required, and the applicable cost calculated at the time of issuance of the Building Permits for each residential unit: Transportation, Fire, Schools, Parks, General Government (SEPA), Police (SEPA), Bicycle & Pedestrian (SEPA).

28 The applicant shall comply with the Mitigation measures set forth by the Mitigated Determination of Nonsignificance issued on January 10, 2020. Please see SEP18-0019 for mitigation measures.

CONSTRUCTION CONDITIONS

The following are construction conditions identifying applicable standards, guidelines, and corrections for construction that the project must comply with. Limited construction level details have been provided with the land use plans, which is typical and not required at this stage of the project. Upon approval of the project, construction drawings must be submitted to the City for review and approval. City Staff provides construction conditions to facilitate preparation of construction drawings if the preliminary plat is approved and expects construction drawings to demonstrate compliance with the following conditions.

1. Construction outreach shall include the following:
    a. on-site signage in conformance with the City's construction sign template, to be erected prior to start of any construction; and,
    b. monthly updates in conformance with the City's template, to be placed in a brochure box with the on-site sign and sent to members of the public who have signed up for updates throughout the duration of construction.
2. Storm water design compliance with 2009 King County Surface Water Design Manual and 2011 Issaquah Addendum to the City adopted storm design manual is required. This includes Conservation Flow Control Standard and Sensitive Lake Water Quality Treatment.
3. All portions of the public water main shall be contained in an easement to be conveyed to the City upon completion of the public water main and acceptance of the same by the City.
4. Clearing and grading activities must be performed during the seasonally drier period (per Section 6.5 Erosion Control, 2017 AESI Geotechnical Report), unless additional information supporting work in the wet season is provided. In Issaquah, the dry season for construction is between April 30th and October 1st.
5. Areas to be used for infiltration and/or bioretention of storm water must be protected from compaction and sedimentation during construction activities. If stockpiling or other construction activities occur in these areas, removal of 6-inches of sediment below the proposed grade is required prior to installation of infiltration facilities.
6. Construction Storm Water General Permit (CSWGP) from Washington State Department of Ecology is required for land disturbing activities one acre or greater and must be obtained prior to construction activities.
7. Standard Details:
    a. Show all applicable Water Standard Details on Construction Drawings.
    b. Use this product and application method for Blow Off Assembly Standard Detail W-04 and Air Vacuum Release Valve Assembly Standard Detail W-07: "Clean, scuff-sand and prepare per paint manufacture's specification. Prime with 1 coat (6 Mills) of Sherwin Williams "Pro-Cryl" Acrylic Primer (B66 W 310 643-22681) and then top-coat with 1 coat (6 Mills) of Sherwin Williams "Cryl-HPA" High Performance Acrylic Gloss, High Gloss Bright White (B66 W 377 6405-18908)."
    c. Add this comment to Water Standard Detail W-04, Item #E, Blow Off Assembly: "Install brass, 4" female Seattle Standard Thread x 2 ½" male National Standard Thread fitting. Install 2 ½" cap NST."

   d. Do not install components #M - #Q, inclusive, for Water Standard Detail W-11, 3" & Larger Meter Installation.
   e. Do not apply any interior coatings (for any component) for General Standard Detail G-05, Vaults—General Features. Leave any manufacturer's coating in place; do not remove factory-applied coatings.
8. Water Mains & System:
   a. All water main flow interruptions shall be scheduled with City PWO at least 14 calendar days ahead. All flow interruptions, individually, shall be no longer than 8-consecutive hours leaving 16-consecutive hours for storage recovery. These instructions are in addition to, or modification to, existing City Standard Operating Procedures for scheduled water main shut-downs.
   b. All water main taps on City-owned water mains greater than 2" shall be made by licensed, "wet-tap," third-party vendor. The third-party vendor shall be City-approved and their primary business is tapping live, in-service, public water mains.
   c. Provide deeded easement(s) for all water mains and appurtenances.
   d. Abandon all unused water main stubs on or facing parcels. Abandon stubs at existing water main, removing the stubbed valve, pipe and valve box.
   e. Install three gate valves at every tee connection and install four gate valves at every 'cross' connection if constructing or tapping any new or existing water main.
   f. Do not plant trees within 10' of any water main, water service line or water meter.
   g. Provide detailed water, sewer and irrigation utility drawings.
9. Water Meters:
   a. Install brass address tag attached to each setter, for all water meters, whether new or existing, within the physical boundaries of this project.
   b. Meters 2.5" and larger:
      i. Developer to plumb from main to meter, install vault and associated piping per Standard Detail. Developer to supply and install meter.
      ii. DSD to assure meter and meter bypass are off and not used until PWO inspects installation and Backflow Assembly installation. DSD to inform PWO when meter is installed.
      iii. Developer to be charged for PWO inspection fee and Meter Transmitter Unit per IMC, in addition to all other applicable fees.
   c. Please plan accordingly for PWO installation of new water meters and services .75" through 2". Lead time is minimum of eight weeks. Final grade elevation at sidewalk or planter where meters are to be installed must be established before City provides installation. Work directly with Public Works Operations (PWO) at (425)837-3470.
   d. Show landscape irrigation water meter. Provide landscape plan showing irrigation connection to potable water, including meter and backflow device.
   e. Request and provide mapped, recorded (with City), street addresses for irrigation meter(s). The address(es) must be obtained before a Landscape Permit is issued and must be recorded on the Utility Application for water service.
   f. Provide detail of domestic water meter(s).

g. Consider dual or redundant water supply to domestic and fire systems for maintenance and repair of water meters, backflow preventers or other equipment that may need maintenance or might fail, and where that system must be shut down.

10. Drinking Water Quality & Backflow Protection:
    a. Backflow devices may need to be installed (irrigation, fire, other). Backflow Permits are separate from all other permits. Multiple backflow devices can be on one permit.
    b. Water Quality inspections required at least at rough-in and final. Schedule inspections through MyPermit.Com. If installing systems connected to potable water such as radiant floor heating, flow-through fire suppression, water features, swimming pools, or installing non-potable water lines for irrigation or wastewater uses, these uses will require backflow protection individually and in addition to any site-required backflow protection. It is highly advisable to work directly, often and early during construction with City PWO (Drinking) Water Quality section. Not doing so may very well delay certificate of occupancy.
    c. This project will require a Reduced Pressure Backflow Assembly (RPBA) installed immediately behind the domestic water meter(s) because of building heights in excess of 30'-0". Contact PWO (Drinking) Water Quality Section for questions and backflow device location questions. Detail assembly and show location on applicable Design and Construction Drawings.
    d. All meters installed (dropped) for this project will be locked off immediately after installation and remain so until an inspection is conducted by PWO (Drinking) Water Quality personnel, and a record of successful testing of the backflow prevention device has been delivered. Meters will be unlocked by City after both of these conditions have been met.
    e. If off-site or on-site reclaimed water is collected, stored or used, a Reduced Pressure Backflow Assembly (RPBA) shall be installed above-ground and immediately behind all domestic and fire water meters associated with this project. It is highly recommended that these above-ground installations be protected from freeze and vandalism. Please work directly, often and early during construction with City PWO (Drinking) Water Quality section. Not doing so may very well delay certificate of occupancy.
    f. Provide civil and mechanical drawings for project and City to be given ample time for review and comments. Include design details for all water-using appurtenances, appliances or amenities.
11. Fire Suppression Systems:
    a. Define if fire suppression system(s) will be installed. If so, define, detail and show supply, and how it shall be metered.
    b. Strict criteria exist for Flow-Through Fire Systems:
        i. If planned, please provide detailed plans for fire suppression system(s) to PWO and other required agencies for review, allowing sufficient time for agency review, comments and approval.

ii. The following elements define a flow-through fire system for (Drinking) Water Quality purposes; these elements must be included into the design without deviation:
    1. No fire department pumper connection;
    2. Potable water piping and materials must be used;
    3. Piping end(s) terminate at a non-human-consumptive fixture using potable water (toilet, washing machine) as its sole water source;
    4. Piping arrangement cannot be looped;
    5. Piping arrangement shall be one continuous pipe without branches or tees unless the branch or tee ends as described in item "iii."
    6. A single feed to an elevated floor is allowed.

iii. Do not install wallboard or other covering material on walls or ceilings where flow-through fire system piping is located until (Drinking) Water Quality inspection has been scheduled, conducted, and the piping arrangement approved.

iv. Do not deviate from flow-through fire system piping design, once approved by (Drinking) Water Quality and other agencies; install piping per approved design.

12. Install CL-53 TR Flex D.I. with valves both sides of the bridge. Connection details must be provided. Provide air-vac if warranted.
13. Provide connection details showing the manhole and force main/casing connection.
14. Radar detection for signal at the intersection a NW Talus Drive and SR 900 will be required.
15. *All mailbox locations shall be approved by the USPS and located on the Site Work Permit. All existing mailboxes shall be relocated as approved by USPS.*

XIII. Exhibits

1. Preliminary Plat Drawings, dated November 8, 2019
2. Project Narrative, received September 24, 2018
3. Land Use Permit Application, received September 24, 2018
4. Cluster Housing Development Agreement, dated December 14, 2016
5. SEPA Mitigated Determination of Nonsignificance, issued January 10, 2020
6. SEPA Checklist, dated August 31, 2018
7. Preliminary Geotechnical Engineering Report, dated May 12, 2017
8. Preliminary Technical Information Report, dated September 19, 2018
9. Critical Area Study & Buffer Mitigation Plan, revised July 11, 2019
10. Tree Report and Inventory, revised November 9, 2019
11. Limited Scope Traffic Analysis, date September 5, 2018
12. Transportation Concurrency Certificate, dated May 1, 2019
13. Affidavit of Mailing – Neighborhood Meeting, dated October 22, 2018
14. Affidavit of Mailing – Notice of Application, dated November 19, 2018
15. Affidavit of Sign Posting, dated January 11, 2020
16. Affidavit of Mailing – Hearing Examiner Public Hearing, dated January 14, 2020
17. Public Comment Letters

SE 1/4, SEC. 29 & NE 1/4, SEC. 32, TWP. 24 N., RGE. 6 E., W.M.

PRELIMINARY PLAT
OF
TIBBETTS CROSSING
FOR
STEVE BURNSTEAD CONSTRUCTION, LLC
ISSAQUAH, WASHINGTON

HORIZONTAL DATUM

NAD 83-2011 WASHINGTON COORDINATE SYSTEM NORTH ZONE BASED ON GPS MEASUREMENTS CONSTRAINED TO THE WASHINGTON REFERENCE NETWORK.

VERTICAL DATUM

NAVD88 CONSTRAINED TO CITY OF BELLEVUE BENCHMARK V-429 AT THE EASTSIDE OF SR900 & TALUS DRIVE.

NOTES

SITE AREA: TL#2924069041 7932 RENTON-ISSAQUAH RD SE

ALL DISTANCES SHOWN ARE GROUND DISTANCES UNLESS OTHERWISE NOTED.

THE LOCATION AND DESCRIPTION OF ALL SURVEY MARKERS SHOWN HEREON ARE BASED ON FIELD OBSERVATIONS TAKEN ON DECEMBER 5, 2009, UNLESS OTHERWISE INDICATED.

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CALL FOR LOCATE: UTILITY LOCATION SERVICE: 811

FEMA FLOOD PLAN DELINEATED FROM FIRM MAP# 53033C0693G AND 53033C0691K

LEGAL DESCRIPTION

LEGAL DESCRIPTION: TAX LOT# 2924006-9041

LOT B OF ISSAQUAH LLA PLN 12-00027 RECORDED
IN KING COUNTY RECORDS UNDER RECORDING NO. 20121213900009

SITE INFORMATION

DRAINAGE BASIN	TALUS
GROSS SITE AREA	21.94 ACRES (955,901 SF)
DEVELOPABLE SITE AREA	10.67 ACRES (464,937 SF)
DEVELOPED SITE AREA	4.41 ACRES
IMPERVIOUS SURFACE	51% OF THE DEVELOPED SITE
PERVIOUS SURFACE	49% OF THE DEVELOPED SITE
REQUIRED SETBACKS	20' TO SR900
PARKING REQUIRED	40 STALLS (40 PROVIDED)
ZONING	SF-E (1.24 DU/AC)
TOTAL NUMBER OF PROPOSED UNITS	20
ALLOWED DENSITY	27 DU/AC
PROPOSED DENSITY	1.10 DU/AC
LAND USE PERMITTED	SINGLE FAMILY RESIDENTIAL
LAND USE PROPOSED	RESIDENTIAL
ASSESSOR'S PARCEL NUMBERS	2924069041
UTILITY PURVEYORS	
WATER	CITY OF ISSAQUAH
SANITARY SEWER	CITY OF ISSAQUAH
STORM DRAINAGE	CITY OF ISSAQUAH
TELEPHONE	QWEST COMMUNICATIONS
POWER	PUGET SOUND ENERGY
GAS	PUGET SOUND ENERGY
CABLE TV	COMCAST
OTHER SERVICES	
SCHOOL DISTRICT	ISSAQUAH SCHOOL DIST. 411
FIRE PROTECTION	EASTSIDE FIRE AND RESCUE

SOIL TYPE

PER THE GEOTECHNICAL REPORT COMPLETED AESI: THE EXPLORATIONS TO THE WEST OF TIBBETTS CREEK GENERALLY ENCOUNTERED VERY LOOSE TO DENSE VASHON RECESSIONAL OUTWASH SEDIMENTS. THE EXPLORATIONS TO THE EAST OF TIBBETTS CREEK GENERALLY ENCOUNTERED MEDIUM DENSE TO DENSE RECESSIONAL OUTWASH SEDIMENTS UNDERLAIN BY MEDIUM DENSE TO DENSE ICE-CONTACT DEPOSITS.

EXISTING VEGETATION

FORESTED

DENSITY CALCULATIONS

MAXIMUM ALLOWABLE DENSITY IS 20 UNITS PER
CLUSTER HOUSING DEVELOPMENT AGREEMENT
KING COUNTY RECORDING NO. 20170124001263

REQUIRED PERMITS

SITE WORK PERMIT
NPDES PERMIT
RIGHT OF WAY USE PERMIT

OWNER

STEVE BURNSTEAD CONSTRUCTION, LLC
11980 NE 24TH STREET, SUITE 200
BELLEVUE, WA 98005
(425)454-1900 EXT. 218
CONTACT: LEO SUVER
LEO@BURNSTEAD.COM

ENGINEER/SURVEYOR PLANNER/LANDSCAPE

CORE DESIGN, INC.
12100 NE 195TH ST., SUITE 300
BOTHELL, WA 98011
(425) 885-7877
CONTACTS -
ENGINEER: SHERI MURATA, P.E.; SHM@COREDESIGNINC.COM
SURVEYOR: ROBERT WEST, P.L.S.; RDW@COREDESIGNINC.COM
LANDSCAPE ARCHITECT: LINDSEY SOLORIO, R.L.A.; LBA@COREDESIGNINC.COM
PLANNER: LAFE HERMANSEN; LBH@COREDESIGNINC.COM

GEOTECHNICAL ENGINEER

ASSOCIATED EARTH SCIENCES, INC.
911 5TH AVENUE
KIRKLAND, WA 98033
(425) 827-7701
CONTACT: MATT MILLER, P.E.
MMILLER@AESGEO.COM

ARBORIST

LONNSON ARBOR CARE
2619 169TH STREET SE
BOTHELL, WA 98012
(425) 891-1741
CONTACT: LONNIE OLSON
LONNSON@JUNO.COM

TRAFFIC ENGINEER

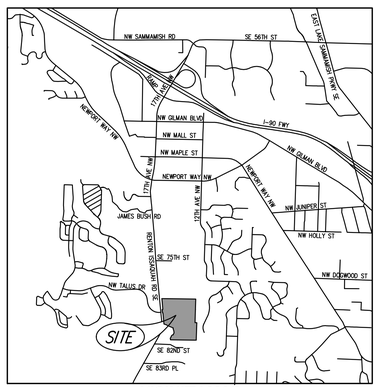
TENW
11400 8TH STREET, SUITE 200
BELLEVUE, WA 98004
(425) 250-0581
CONTACT: JEFF SCHRAMM
SCHRAMM@TENW.COM

WETLAND CONSULTANT

WETLAND RESOURCES, INC.
9505 19TH AVENUE SE, SUITE 106
EVERETT, WA 98208
(425) 337-3174
CONTACT: TESS AMEN
TESS@WETLANDRESOURCES.COM

SHEET INDEX

C1.01	TITLE SHEET
C1.02-C1.03	EXISTING CONDITIONS PLAN
C1.04	PRELIMINARY PLAT MAP
C4.00	COMPOSITE GRADING AND UTILITY PLAN
C4.01-C4.03	PRELIMINARY GRADING AND UTILITY PLAN
C4.21	PRELIMINARY ROAD PROFILES AND DETAILS
C4.22	PRELIMINARY ROAD PROFILES
C4.31	PRELIMINARY ROAD SECTIONS
L1.01	PRELIMINARY TREE RETENTION PLAN
L2.01	PRELIMINARY LANDSCAPE PLAN
L2.02	PRELIMINARY LANDSCAPE SCHEDULE AND NOTES
L2.31	PRELIMINARY LANDSCAPE DETAILS



VICINITY MAP
1"=2000'

PERMIT NO. PP18-00002

NO.	REVISIONS	DATE
1	PER CITY COMMENTS	1/7/19
2	PER CITY COMMENTS	6/14/19
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11-12-19

CORE DESIGN
CIVIL ENGINEERING
LANDSCAPE ARCHITECTURE
PLANNING
SURVEYING
12100 NE 195th St, Suite 300 Bothell, Washington 98011 425.885.7877

TITLE SHEET
TIBBETTS CROSSING
STEVE BURNSTEAD CONSTRUCTION, LLC
11980 NE 24TH STREET SUITE 200
BELLEVUE, WA 98005

DATE	AUGUST 2018	
DESIGNED	SHERI H. MURATA, P.E.	
DRAWN	DAVID S. VAUGHN	
APPROVED	SHERI H. MURATA, P.E.	PROJECT MANAGER

SHEET C1.01 OF 14

PROJECT NUMBER 17127

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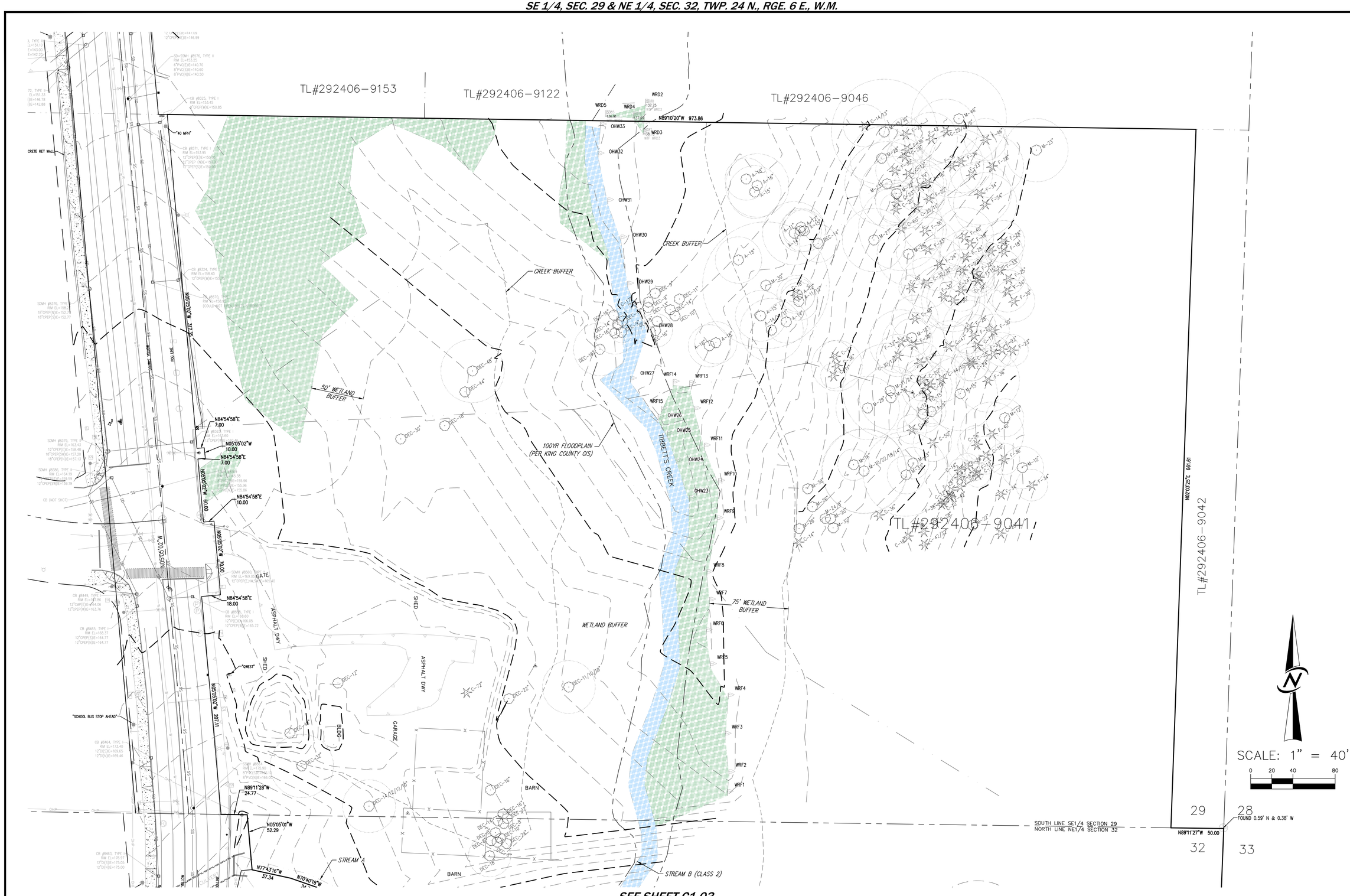

SEE SHEET C1.03

REVISIONS		
NO.		DATE
1	PER CITY COMMENTS	1/7/19
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APPROVED	SHERI H. MURATA, P.E. PROJECT MANAGER

SHEET	OF
C1.02	14

PROJECT NUMBER
17127

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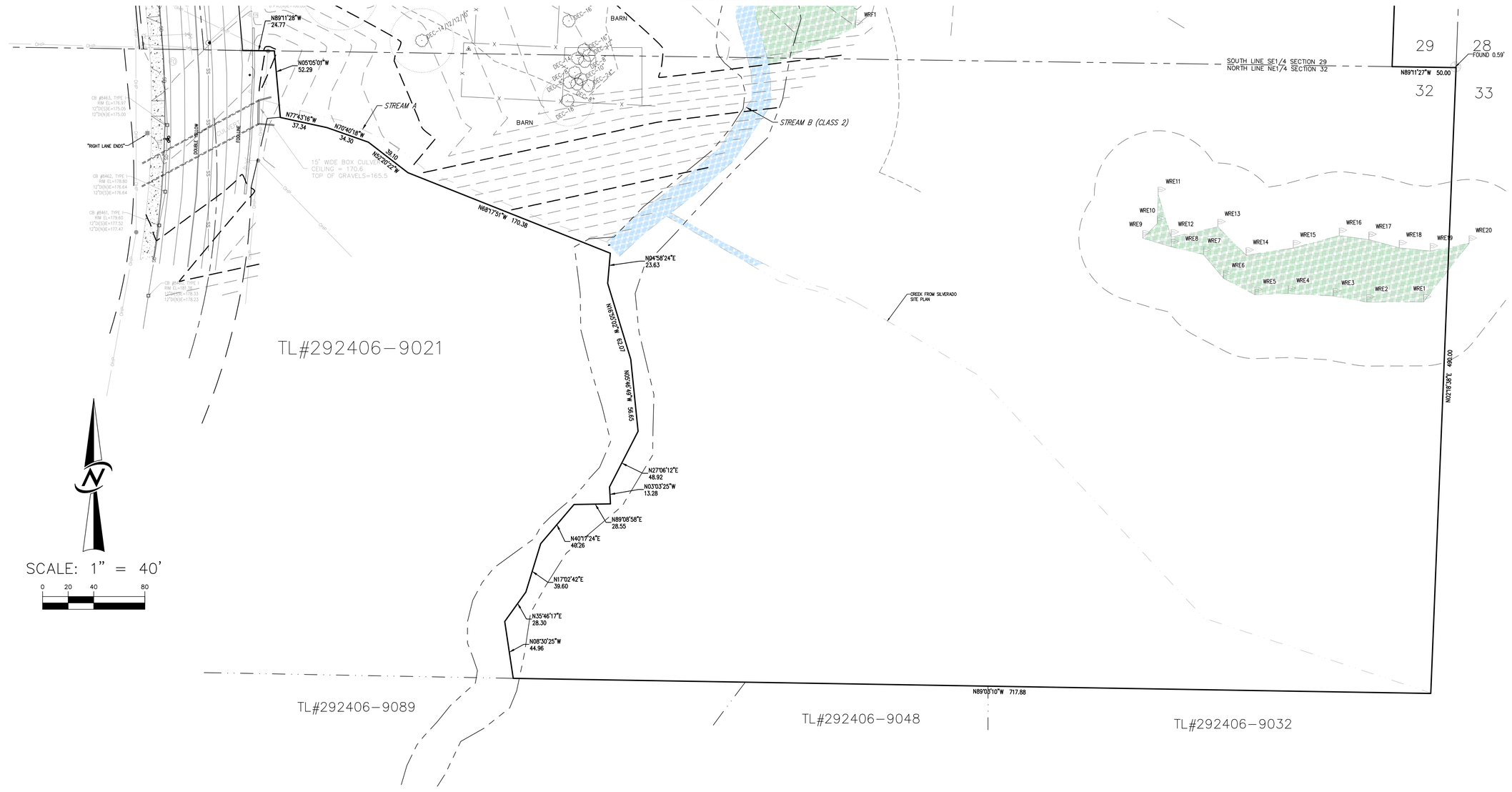
SE 1/4, SEC. 29 & NE 1/4, SEC. 32, TWP. 24 N., RGE. 6 E., W.M.

SEE SHEET C1.02



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FEMA FLOOD PLAN DELINEATED FROM FIRM MAP# 53033C0693G AND 53033C0691K

LEGAL DESCRIPTION

LEGAL DESCRIPTION: TAX LOT# 2924006-9041

LOT B OF ISSAQUAH LLA PLN 12-00027 RECORDED
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12100 NE 195th St, Suite 300 Bothell, Washington 98011 425.885.7877

EXISTING CONDITIONS
TIBBETTS CROSSING

STEVE BURNSTEAD CONSTRUCTION, LLC

11980 NE 24TH STREET SUITE 200
BELLEVUE, WA 98005

DATE	AUGUST 2018
DESIGNED	SHERI H. MURATA, P.E.
DRAWN	DAVID S. VAUGHN
APPROVED	SHERI H. MURATA, P.E.
	SHERI H. MURATA, P.E. PROJECT MANAGER

SHEET	OF
C1.03	14

PROJECT NUMBER
17127

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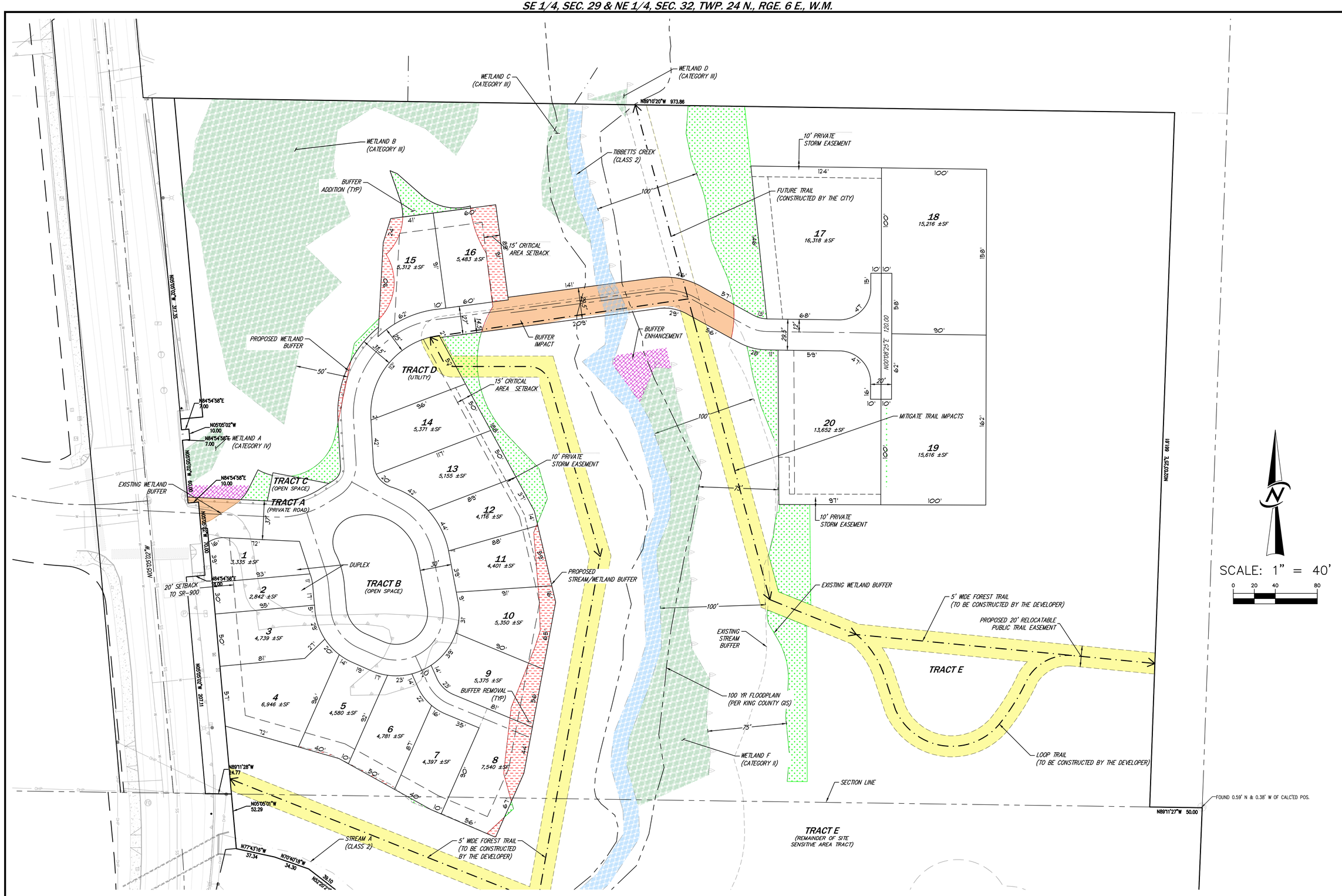

SEE SHEET C1.05

BUFFER AVERAGING	
BUFFER REDUCTION	(6,782 SF)
BUFFER ADDITION	(22,110 SF)
BUFFER IMPACT	(7,090 SF)
BUFFER ENHANCEMENT	(2,420 SF)

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PROFESSIONAL ENGINEER DAVID S. BASS STATE OF WASHINGTON 46854 11-12-19

CORE DESIGN
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12100 NE 195th St, Suite 300 Bothell, Washington 98011 425.885.7877

PRELIMINARY PLAT MAP
TIBBETTS CROSSING

STEVE BURNSTEAD CONSTRUCTION, LLC

11980 NE 24TH STREET SUITE 200
BELLEVUE, WA 98005

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C1.04	14

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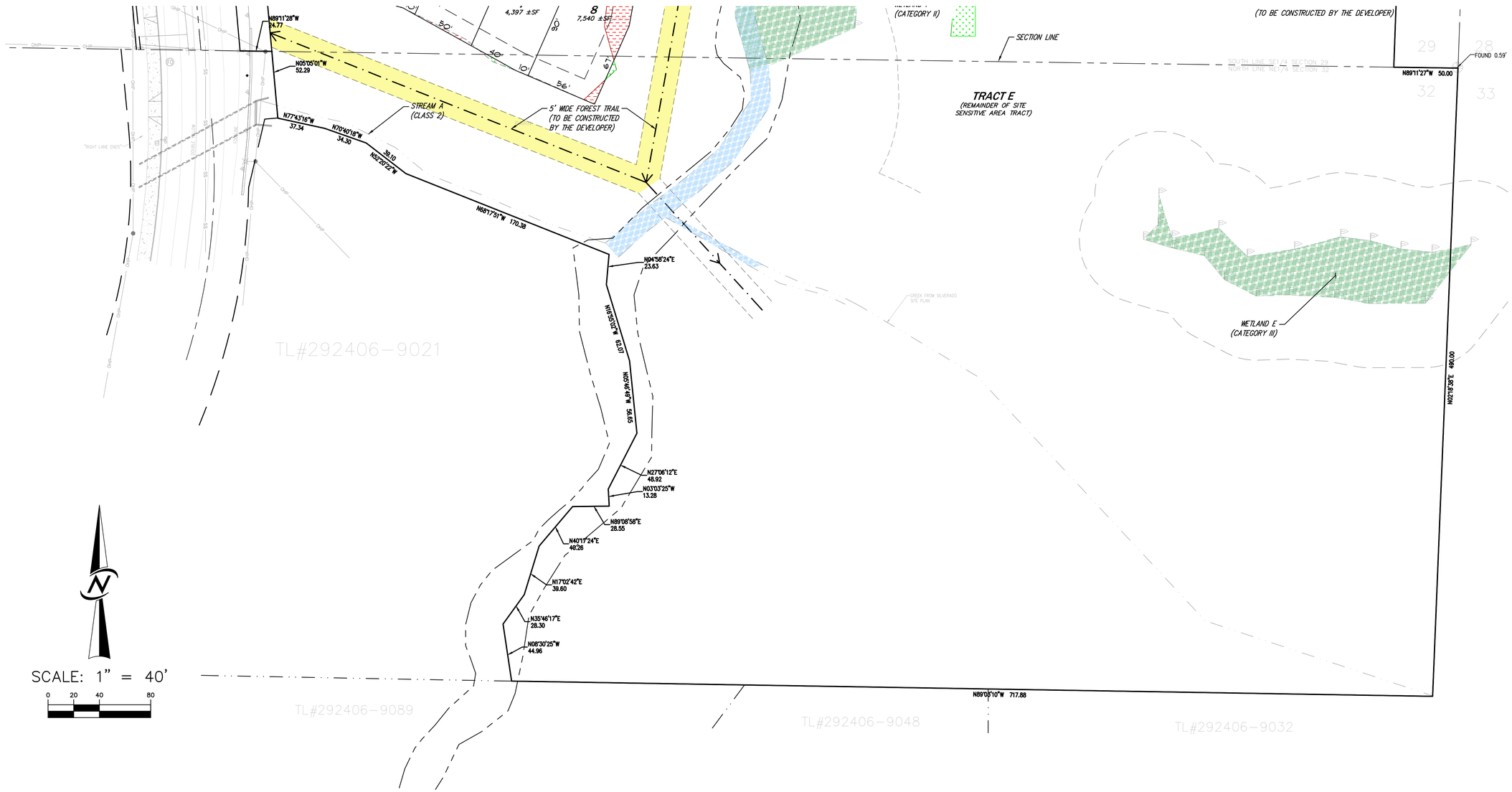

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FEMA FLOOD PLAN DELINEATED FROM FIRM MAP# 53033C0693G AND 53033C0691K

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REGISTERED PROFESSIONAL ENGINEER
DAVID S. VAUGHN
STATE OF WASHINGTON
40484
11-12-19

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PRELIMINARY PLAT MAP
TIBBETTS CROSSING

STEVE BURNSTEAD CONSTRUCTION, LLC

11980 NE 24TH STREET SUITE 200
BELLEVUE, WA 98005

DATE	AUGUST 2018
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DRAWN	DAVID S. VAUGHN
APPROVED	SHERI H. MURATA, P.E.
	SHERI H. MURATA, P.E. PROJECT MANAGER

SHEET C1.05 OF 14

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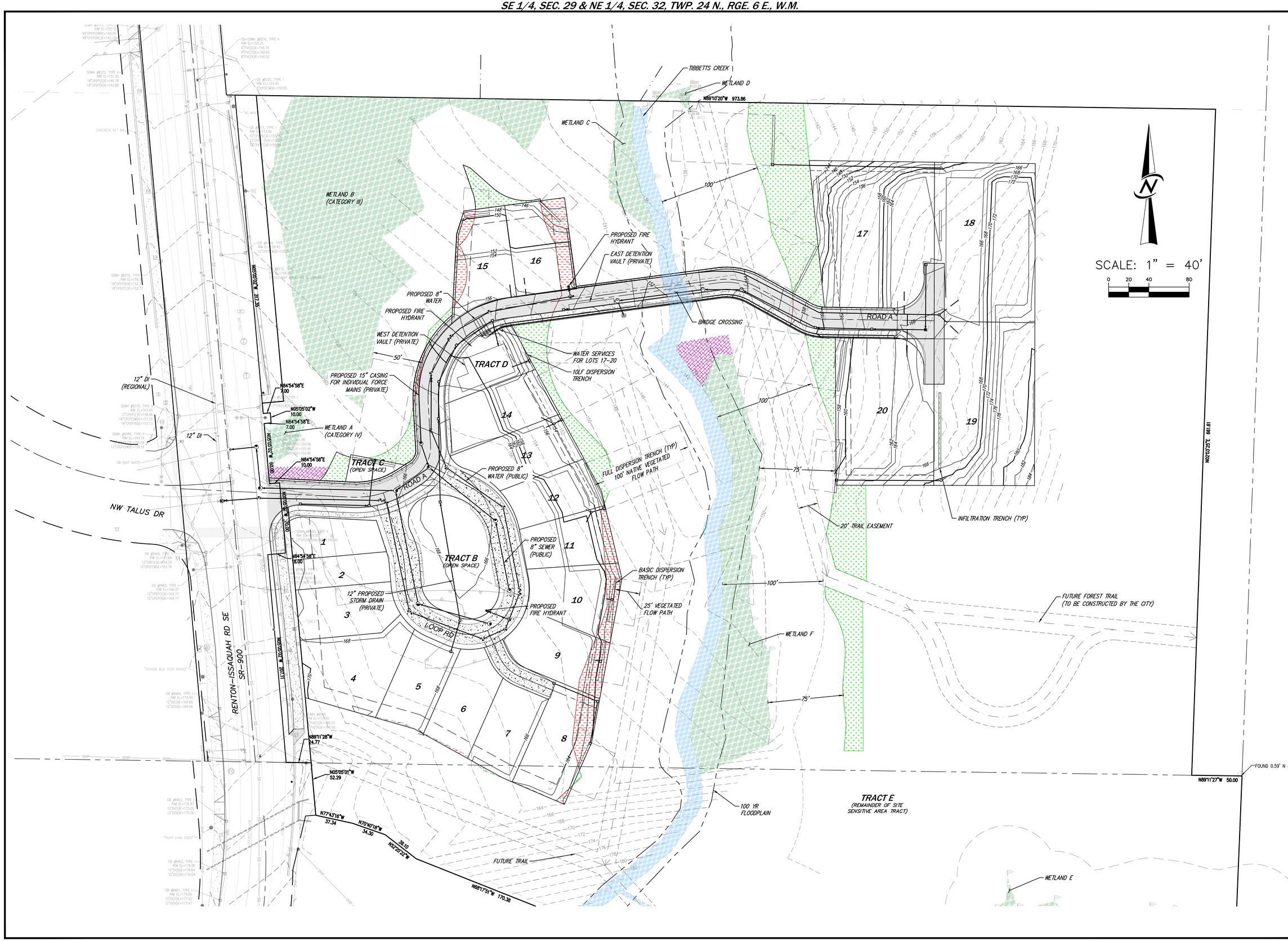

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11-12-19

CIVIL ENGINEERING
LANDSCAPE ARCHITECTURE
PLANNING
SURVEYING

CORE DESIGN

12100 NE 195th St, Suite 300 Bothell, Washington 98011 425.885.7877

COMPOSITE GRADING AND UTILITY PLAN
TIBBETTS CROSSING

STEVE BURNSTEAD CONSTRUCTION, LLC

11980 NE 24TH STREET SUITE 200
BELLEVUE, WA 98005

DATE	AUGUST 2018	
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DRAWN	DAVID S. VAUGHN	
APPROVED	SHERI H. MURATA, P.E.	PROJECT MANAGER

SHEET	OF
C4.00	14

PROJECT NUMBER 17127

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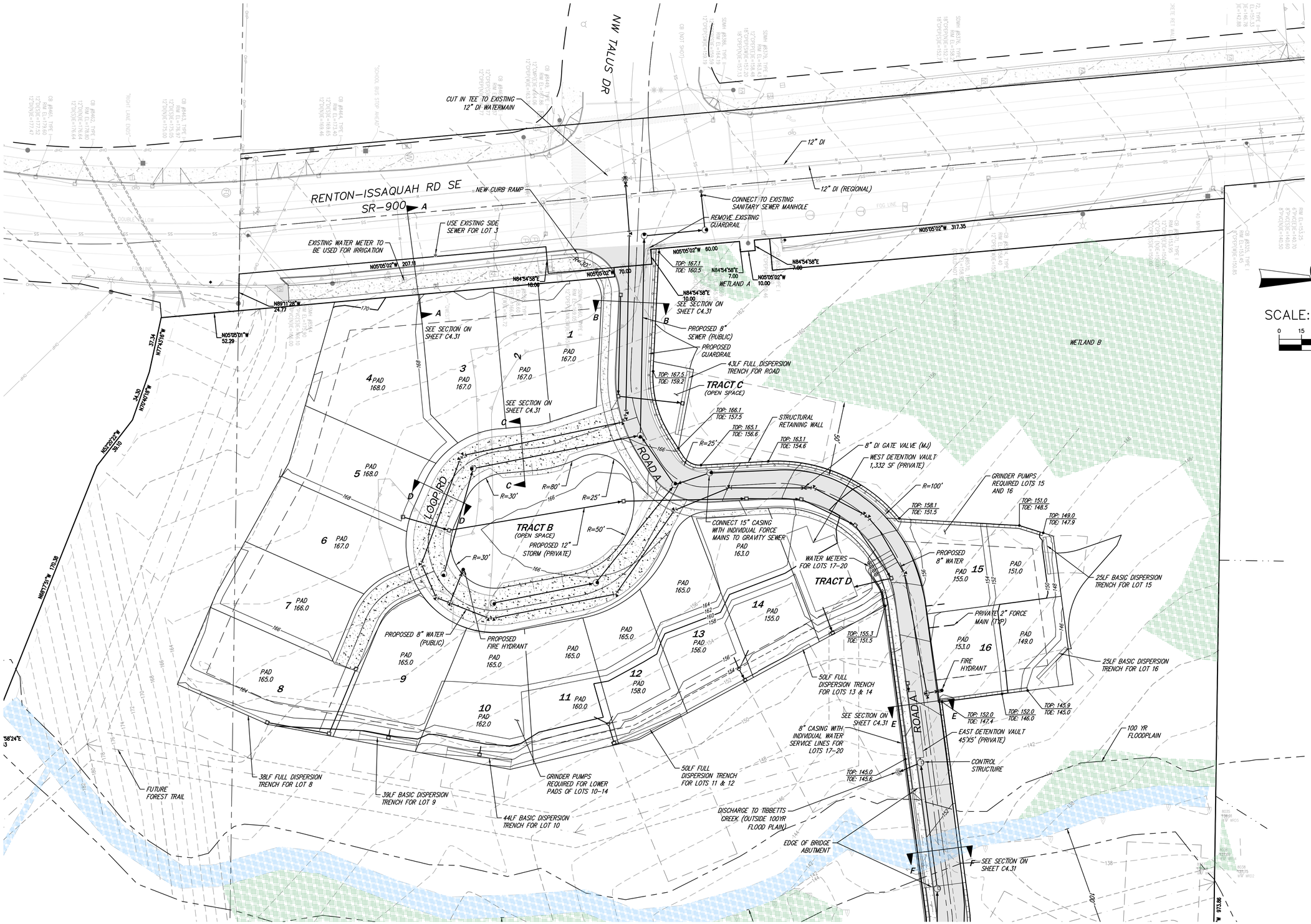

SEE SHEET C4.02

FLOW CONTROL STANDARD

CONSERVATION FLOW CONTROL

WATER QUALITY TREATMENT STANDARD

SENSITIVE LAKE (MET WITH OPTION 4 BASIC WATER QUALITY & PHOSPHOROUS)

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PRELIMINARY GRADING AND UTILITY PLAN
TIBBETTS CROSSING

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BELLEVUE, WA 98005

DATE	AUGUST 2018
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APPROVED	SHERI H. MURATA, P.E. PROJECT MANAGER

SHEET C4.01 OF 14

PROJECT NUMBER 17127

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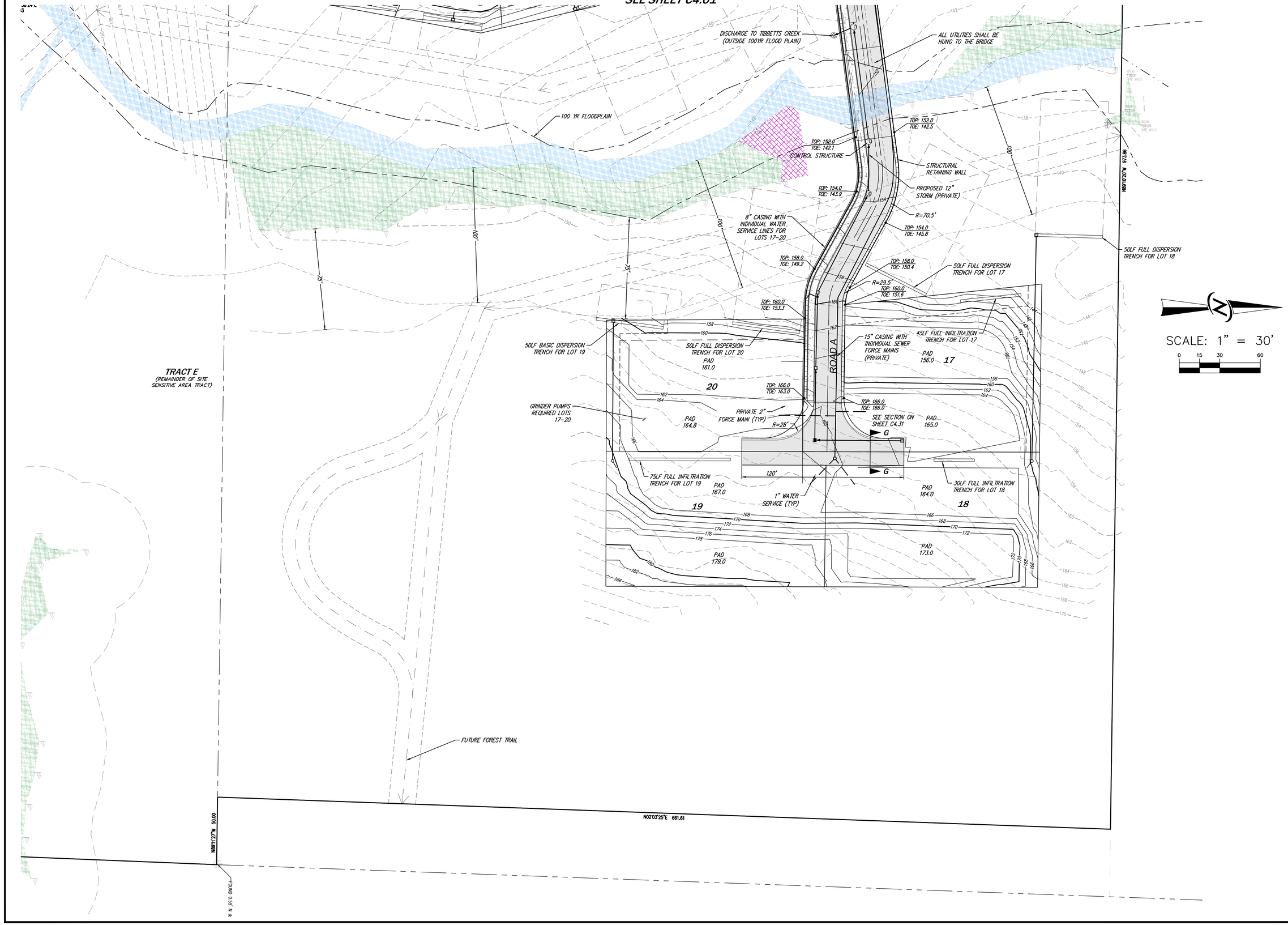
SEE SHEET C4.01



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SHEET	OF
C4.02	14

PROJECT NUMBER 17127

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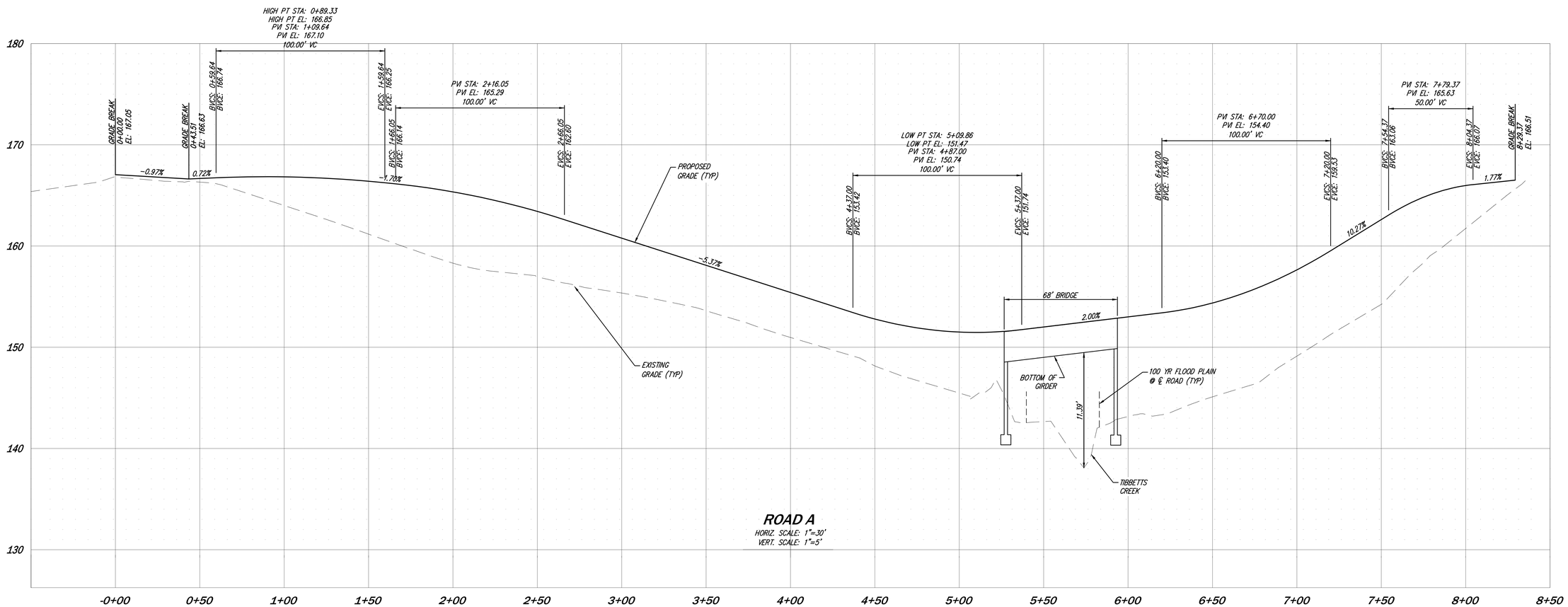

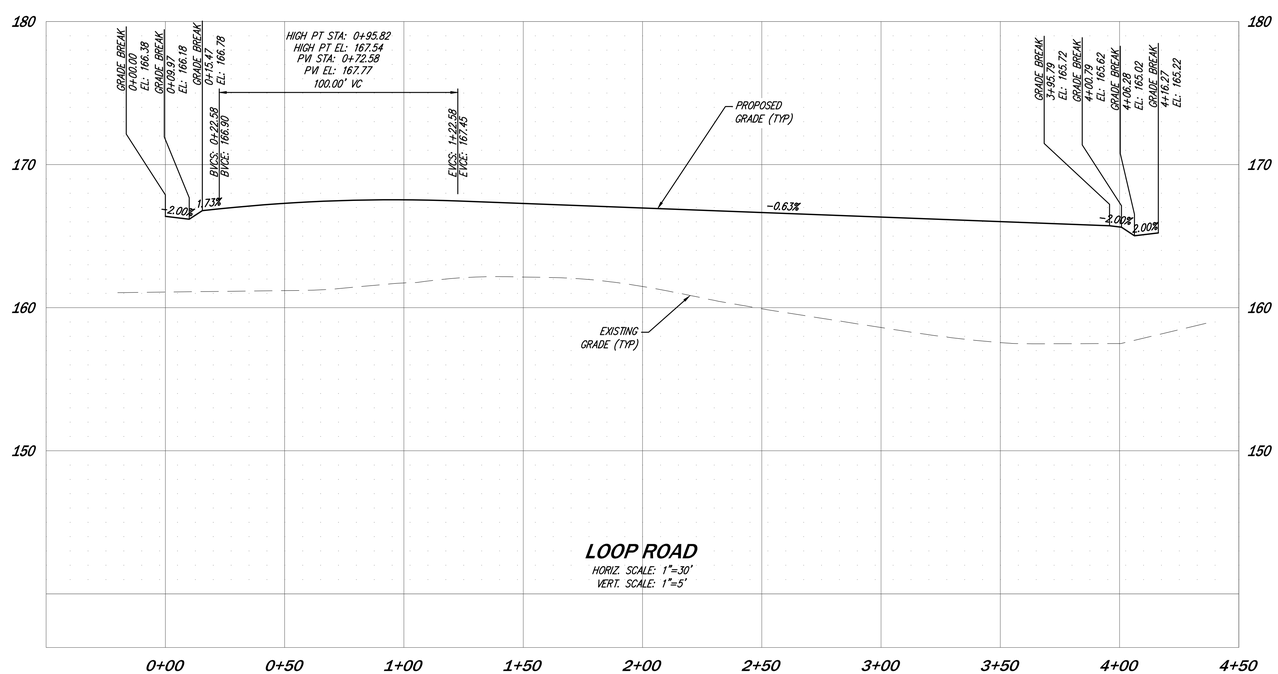

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2	PER CITY COMMENTS	6/14/19
3	PER CITY COMMENTS	8/30/19
4	PER CITY COMMENTS	10/1/19
5	PER CITY COMMENTS	11/8/19

11-12-19

CORE DESIGN
CIVIL ENGINEERING
LANDSCAPE ARCHITECTURE
PLANNING
SURVEYING
12100 NE 195th St, Suite 300 Bothell, Washington 98011 425.885.7877

PRELIMINARY ROAD PROFILES
TIBBETTS CROSSING

STEVE BURNSTEAD CONSTRUCTION, LLC
11980 NE 24TH STREET SUITE 200
BELLEVUE, WA 98005

DATE	AUGUST 2018
DESIGNED	SHERI H. MURATA, P.E.
DRAWN	DAVID S. VAUGHN
APPROVED	SHERI H. MURATA, P.E.

SHERI H. MURATA, P.E.
PROJECT MANAGER

SHEET C4.21 OF 14

PROJECT NUMBER 17127

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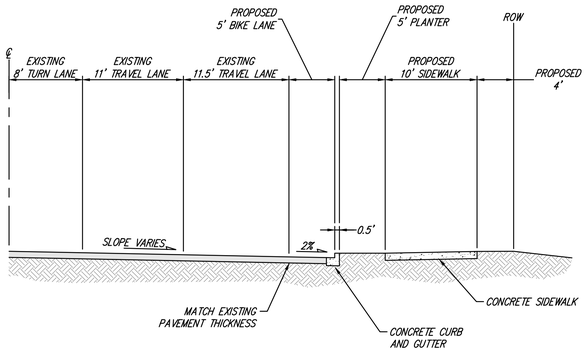
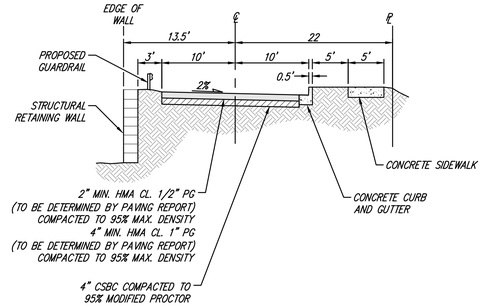


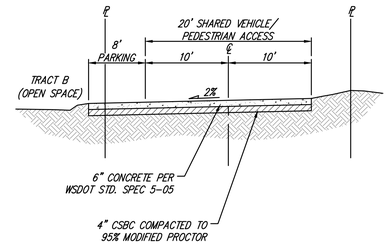
SECTION A-A
RENTON - ISSAQUAH RD SE (PUBLIC)

NO SCALE



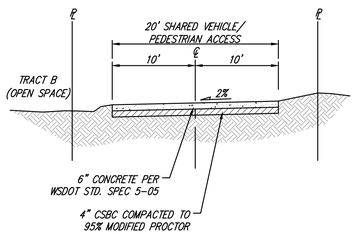
SECTION B-B
ROAD A (PRIVATE)

NO SCALE



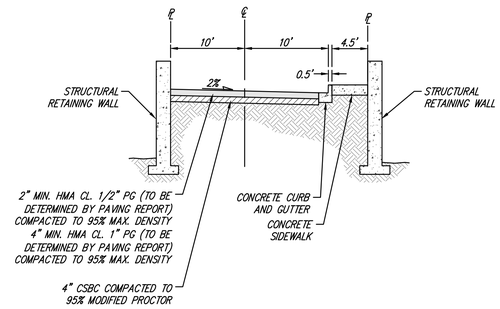
SECTION C-C
ROAD A (PRIVATE)

NO SCALE



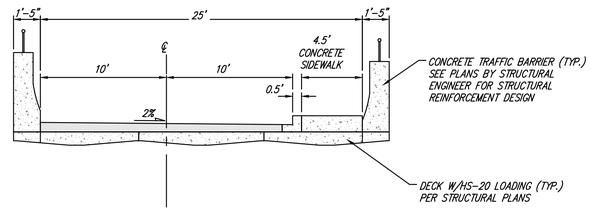
SECTION D-D
ROAD A (PRIVATE)

NO SCALE



SECTION E-E
ROAD A (PRIVATE)

NO SCALE

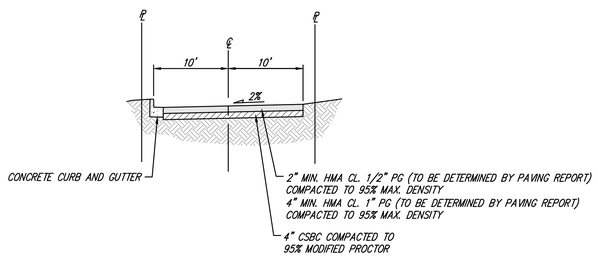


NOTE:

TO BE DESIGNED BY A STRUCTURAL ENGINEER.

BRIDGE SECTION F-F

NO SCALE



SECTION G-G
ROAD A (PRIVATE)

NO SCALE

NO.	REVISIONS	DATE
1	PER CITY COMMENTS	1/7/19
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5	PER CITY COMMENTS	11/8/19

11-12-19

CORE DESIGN
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12100 NE 195th St, Suite 300 Bothell, Washington 98011 425.885.7877

PRELIMINARY ROAD SECTIONS
TIBBETTS CROSSING

STEVE BURNSTEAD CONSTRUCTION, LLC

11980 NE 24TH STREET SUITE 200
BELLEVUE, WA 98005

DATE	AUGUST 2018
DESIGNED	SHERI H. MURATA, P.E.
DRAWN	DAVID S. VAUGHN
APPROVED	SHERI H. MURATA, P.E. PROJECT MANAGER

SHEET	OF
C4.31	14

PROJECT NUMBER 17127

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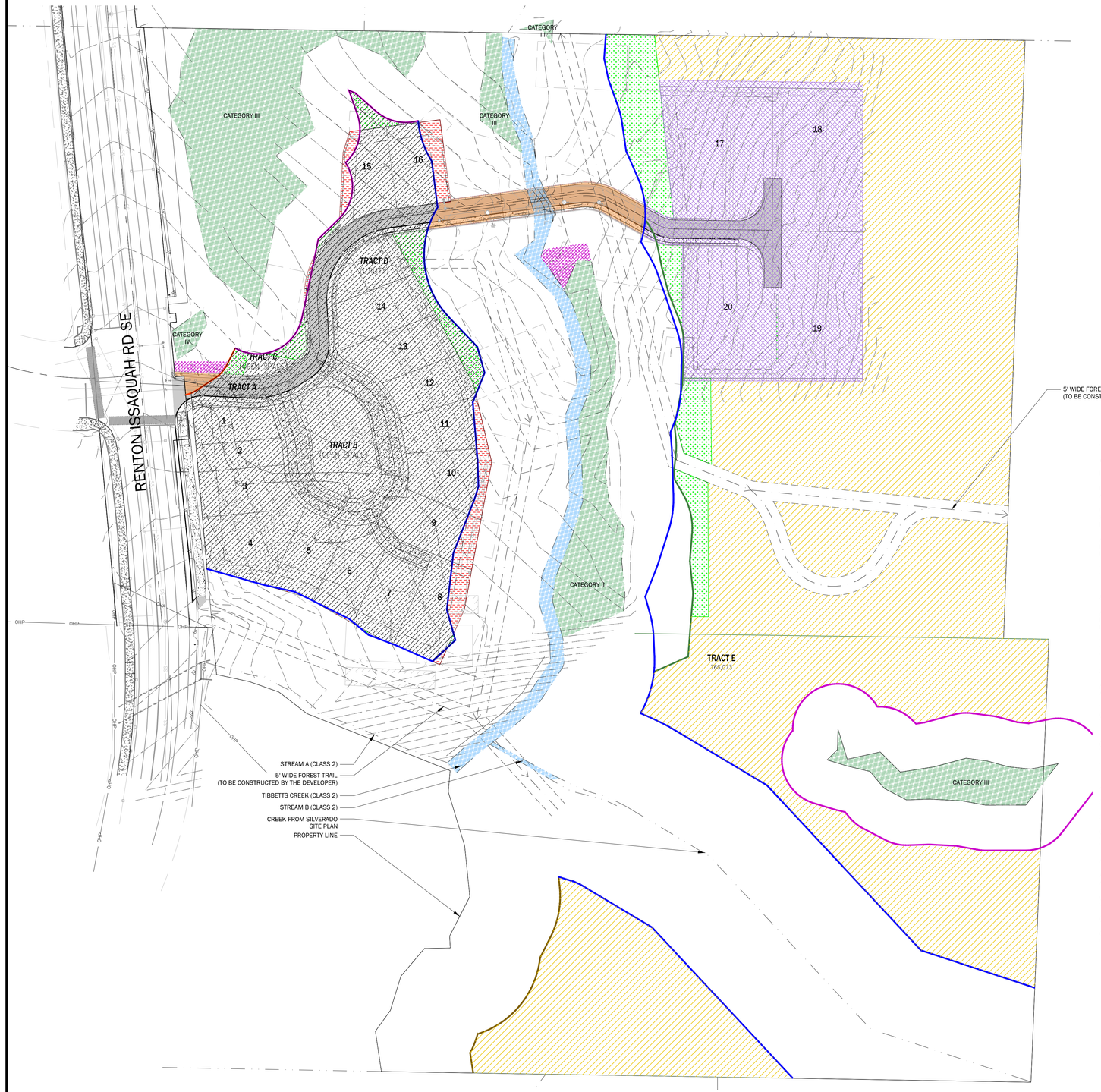

PRELIMINARY TREE RETENTION PLAN

SCALE: 1" = 60'

N

SCALE: 1" = 60'

0 30 60 120

AREAS

AREA A (PLANNED AREA OF DEVELOPMENT) - 'PASTURE' (SEE ARBORIST REPORT FOR REFERENCE)
TREE DIAMETER INCHES PROPOSED TO BE REMOVED IN THIS AREA
IN ACCORDANCE WITH THE ARBORIST REPORT:
4.97 ACRES, 81.5 TREE DIAMETER INCHES OF VIABLE TREES

AREA B (PLANNED AREA OF DEVELOPMENT) - WITHIN 'FOREST' (SEE ARBORIST REPORT FOR REFERENCE)
TREE DIAMETER INCHES PROPOSED TO BE REMOVED IN THIS AREA
IN ACCORDANCE WITH THE ARBORIST REPORT:
1.57 ACRES, 1,470.7 TREE DIAMETER INCHES OF VIABLE TREES

AREA C - WITHIN 'FOREST' (SEE ARBORIST REPORT FOR REFERENCE)
TREE DIAMETER INCHES PROPOSED TO BE RETAINED IN THIS AREA
IN ACCORDANCE WITH THE ARBORIST REPORT:
4.13 ACRES, 3,869.1 TREE DIAMETER INCHES OF VIABLE TREES

TREE RETENTION CALCULATIONS

IN ACCORDANCE WITH THE ARBORIST REPORT FOR ALL OF THE FOLLOWING:

DI = TREE DIAMETER INCHES
AC = ACRES

PASTURE: AREA A
STREAM: AREA OUTSIDE OF AREA A, AREA B, AND AREA C (SEE BUFFER LINE FOR DELINEATION)
FOREST: AREA B + AREA C

AREA A (SEE ITEMS IN AREAS AND BUFFER FOR REFERENCE):
EXCEPT FOR THE 'BUFFER ADDITION' AREA, ALL TREE DIAMETER INCHES PROPOSED TO BE REMOVED IN THIS AREA

TOTAL TREE DIAMETER INCHES FOR THIS AREA: 81.50 DI
TOTAL ACRES FOR THIS AREA: 4.97 AC
TOTAL TREE DIAMETER INCHES PER ACRE FOR THIS AREA: 16.40 DI/AC

81.50 DI / 4.97 AC = 16.40 DI/AC

AREA B (SEE ITEMS IN AREAS AND BUFFERS FOR REFERENCE):
EXCEPT FOR THE 'BUFFER ADDITION' AREA, ALL TREE DIAMETER INCHES PROPOSED TO BE REMOVED IN THIS AREA

TOTAL TREE DIAMETER INCHES FOR THIS AREA: 1,470.70 DI
TOTAL ACRES FOR THIS AREA: 1.57 AC
TOTAL TREE DIAMETER INCHES PER ACRE FOR THIS AREA: 936.80 DI/AC

1,470.70 DI / 1.57 AC = 936.80 DI/AC

AREA C (SEE ITEMS IN AREAS AND BUFFERS FOR REFERENCE):
ALL TREE DIAMETER INCHES PROPOSED TO BE RETAINED IN THIS AREA

TOTAL TREE DIAMETER INCHES FOR THIS AREA: 3,869.1 DI
(3,869.1 DI)/ (4.13 AC) = 936.80 DI/AC
TOTAL TREE DIAMETER INCHES PER ACRE FOR THIS AREA: 936.80 DI/AC

TOTAL TREE DIAMETER INCHES FOR THIS AREA PLUS AREA B: 5,339.8 DI
(5,339.8 DI)/ (4.13 AC + 1.57 AC) = (5,339.8 DI/ 5.70 AC) = 936.80 DI/AC
TOTAL TREE DIAMETER INCHES PER ACRE FOR THIS AREA PLUS AREA B: 936.80 DI/AC

TOTAL ACRES FOR THIS AREA: 4.13 AC
TOTAL ACRES FOR THIS AREA PLUS AREA B: 5.70 AC

4.13 AC + 1.57 AC = 5.70 AC

5,339.8 DI - 1,470.70 DI = 3,869.1 DI

10.67 AC - (4.97 AC + 1.57 AC) = 10.67 AC - 6.54 AC = 4.13 AC

(5,421.3 DI - 1,552.2 DI/AC)/ 5,421.3 = 0.714 * 100
=71.40% OF TREES DIAMETER INCHES PROPOSED TO BE RETAINED IN THIS AREA IN RELATION TO THE 'FOREST' AS A WHOLE OR AREAS B AND C

AVERAGE CALCULATIONS ACROSS AREAS A, B, AND C AS A WHOLE:

APPROXIMATELY 10.67 ACRES (508.1 DI/AC ON AVERAGE) FOR THE FOLLOWING AREAS:
AREA A, AREA B, AND AREA C

(81.50 DI + 5,339.8 DI) = 5,421.3 DI (TOTAL FOR AREAS A, B, AND C)
5,421.3 DI / 10.67 AC = 508.1 DI/AC (AVERAGE FOR AREAS A, B, AND C)

(10.67 AC) - (4.97 AC + 1.57 AC) = 4.13 AC

(508.1 DI/AC * 4.13) / 5,421.3 DI) = 0.3871 * 100
= 38.71% TREE RETENTION PLAN FOR THE DEVELOPABLE SITE AREA (AREA A, AREA B, AND AREA C)

ENVIRONMENTAL CRITICAL AREAS & BUFFERS

100' BUFFER LINE (CREEK & STREAM - CLASS 2)
75' BUFFER LINE (WETLAND - CATEGORY II)
50' BUFFER LINE (WETLAND - CATEGORY III)
40' BUFFER LINE (WETLAND - CATEGORY IV)
PROPERTY LINE - BUFFER LINE

WETLAND
(FOR REFERENCE)

TIBBETT'S CREEK
(FOR REFERENCE)

BUFFER ADDITION - TREE DIAMETER INCHES TO BE RETAINED IN THIS AREA
(PROPOSED UNDEVELOPED AREA OUTSIDE OF THE EXISTING BUFFER)
(SEE BUFFER LINE FOR DELINEATION)
*MAY OVERLAP ANOTHER HATCH

BUFFER REMOVAL - TREE DIAMETER INCHES TO BE REMOVED IN THIS AREA
(PROPOSED DEVELOPED AREA WITHIN THE EXISTING BUFFER)
(SEE BUFFER LINE ABOVE FOR DELINEATION)
*MAY OVERLAP ANOTHER HATCH

BUFFER IMPACT

BUFFER ENHANCEMENT

NOTES

1. FOR TREE INVENTORY AND DATA SHEETS, REFER TO "ARBORIST REPORT" BY LONNSON ARBOR CARE.
2. A TREE DESIGNATED FOR RETENTION SHALL NOT HAVE THE SOIL GRADE ALTERED WITHIN ITS DRIPLINE OR WITHIN FIFTEEN (15) FEET OF ITS TRUNK, WHICHEVER IS GREATER.
3. INDIVIDUAL DECIDUOUS TREES OR CLUSTERS OF TREES WITH OUTSTANDING QUALITIES, FORM AND HEALTH SHALL BE RETAINED WHENEVER POSSIBLE.
4. TREES SHALL NOT BE DESIGNATED FOR RETENTION IF THEY ARE DEAD OR IN A DECLINING STATE, OR IF THEY ARE HAZARDOUS.
5. GENERAL TREE RETENTION REQUIREMENT: 25% OF THE TOTAL CALIPER (4.5 FEET ABOVE GROUND OR "DBH") OF ALL SIGNIFICANT TREES IN DEVELOPABLE SITE AREA SHALL BE RETAINED EXCEPT AS MODIFIED BY "MODIFICATION TO TREE RETENTION REQUIREMENTS."
6. FOR ALL OTHER TREE REMOVAL (I.E. SINGLE FAMILY RESIDENTIAL) : ONE (1) REPLACEMENT TREE FOR EVERY (6) INCHES OF CALIPER AT DBH OF TREES REMOVED IF REMAINING TREE DENSITY IS BELOW THE MINIMUM REQUIREMENTS IN, SECTION 10.10 MINIMUM TREE DENSITY REQUIREMENTS.
7. REPLACEMENT TREE LOCATION: THE APPLICANT'S PROPOSED LOCATION OF TRANSPLANTED OR REPLACEMENT TREES SHALL BE SUBJECT TO APPROVAL OF THE DIRECTOR AS PART OF THE TREE REPLACEMENT PLAN.
8. TO PROTECT ENVIRONMENTAL FUNCTIONS AND PUBLIC SAFETY, THE FOLLOWING AREAS REQUIRE SETBACKS OR BUFFERS: STEEP SLOPE HAZARD AREAS, WETLANDS, STREAMS, AND FLOOD HAZARD AREAS

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5	PER CITY COMMENTS	11/8/19

STATE OF WASHINGTON REGISTERED LANDSCAPE ARCHITECT
LINDSEY BENNETT SOLORIO
CERTIFICATE NO. 135
04/17/2020

CORE DESIGN
CIVIL ENGINEERING
LANDSCAPE ARCHITECTURE
PLANNING
SURVEYING
12100 NE 195th St, Suite 300 Bothell, Washington 98011 425.885.7877

PRELIMINARY TREE RETENTION PLAN
TIBBETTS CROSSING

STEVE BURNSTEAD CONSTRUCTION, LLC

11980 NE 24TH STREET SUITE 200
BELLEVUE, WA 98005

DATE	AUGUST 2018
DESIGNED	SPENCER BUISSON
DRAWN	SPENCER BUISSON
APPROVED	LINDSEY B. SOLORIO, P.L.A.
	SHERI H. MURATA, P.E. PROJECT MANAGER

SHEET L1.01 OF 14

PROJECT NUMBER 17127

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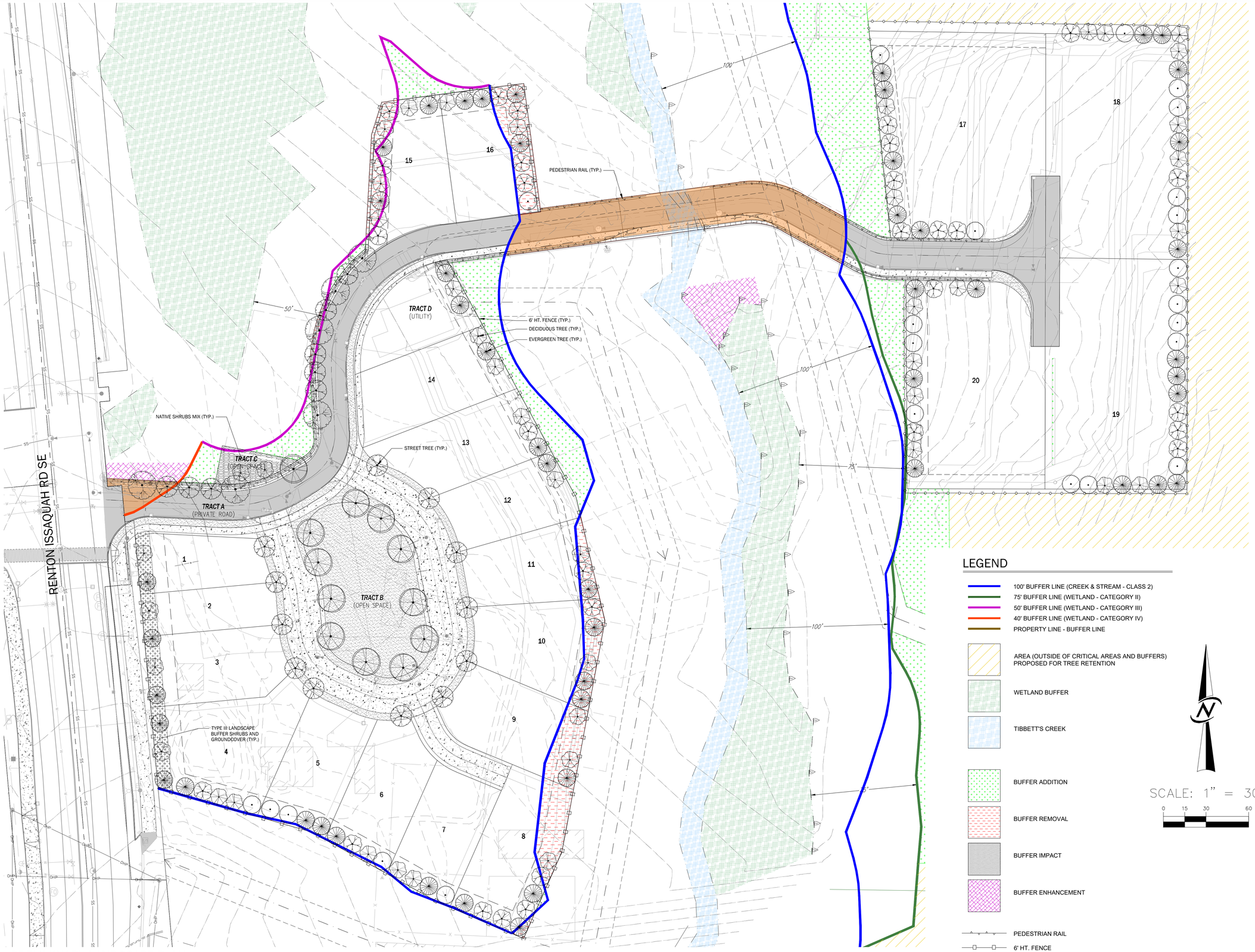
SE 1/4, SEC. 29 & NE 1/4, SEC. 32, TWP. 24 N., RGE. 6 E., W.M.



PRELIMINARY LANDSCAPE PLAN

SCALE: 1" = 30'

NO.	REVISIONS	DATE
1	PER CITY COMMENTS	1/7/19
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4	PER CITY COMMENTS	10/1/19
5	PER CITY COMMENTS	11/8/19

STATE OF WASHINGTON REGISTERED LANDSCAPE ARCHITECT

LINDSEY BENNETT SOLORIO
CERTIFICATE NO. 1351
04/17/2020

CORE DESIGN
CIVIL ENGINEERING
LANDSCAPE ARCHITECTURE
PLANNING
SURVEYING
12100 NE 195th St, Suite 300 Bothell, Washington 98011 425.885.7877

PRELIMINARY LANDSCAPE PLAN
TIBBETTS CROSSING

STEVE BURNSTEAD CONSTRUCTION, LLC

11980 NE 24TH STREET SUITE 200
BELLEVUE, WA 98005

DATE	AUGUST 2018	
DESIGNED	SPENCER BUSSON	
DRAWN	SPENCER BUSSON	
APPROVED	LINDSEY B. SOLORIO, P.L.A.	SHERI H. MURATA, P.E. PROJECT MANAGER

SHEET	OF
L2.01	14

PROJECT NUMBER
17127

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PLANT SCHEDULE

TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	COMMENTS
	42	ACER CIRCINATUM	VINE MAPLE	7`-8` HT. MIN.	AS SHOWN	MULTI-STEM
	12	CORNUS KOUSA `EDDIE`S WHITE WONDER`	KOUSA DOGWOOD	2" CAL. MIN.	AS SHOWN	WELL-BRANCHED
	50	PSEUDOTSUGA MENZIESII	DOUGLAS FIR	6` - 8` MIN HT.	AS SHOWN	WELL-BRANCHED
	32	RHAMNUS PURSHIANA	CASCARA	1.5" CAL./10` HT. MIN.	AS SHOWN	WELL-BRANCHED
	24	THUJA PLICATA	WESTERN RED CEDAR	6` - 8` MIN HT.	AS SHOWN	WELL-BRANCHED

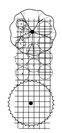
STREET TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	COMMENTS
	6	ACER GINNALA `FLAME`	FLAME AMUR MAPLE	2" CAL. MIN.	AS SHOWN	STREET TREE QUALITY
	20	PYRUS CALLERYANA `BRADFORD`	BRADFORD CALLERY PEAR	2" CAL. MIN./10` HT. MIN.	AS SHOWN	STREET TREE QUALITY

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	COMMENTS
	3	GAULTHERIA SHALLON	SALAL	3 GAL./24" HT. MIN.	3` O.C.	FULL & BUSHY
	3	SPIRAEA DOUGLASII	WESTERN SPIREA	3 GAL./24" HT. MIN.	4` O.C.	FULL & BUSHY
	5	VACCINIUM OVATUM	EVERGREEN HUCKLEBERRY	3 GAL./24" HT. MIN.	4` O.C.	FULL & BUSHY

SHRUB AREAS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	COMMENTS
	903 SF	NATIVE SHRUB MIX				
		GAULTHERIA SHALLON	SALAL	3 GAL./ 24" HT. MIN.	3' O.C.	FULL & BUSHY
		RIBES SANGUINEUM	RED FLOWERING CURRANT	3 GAL./ 24" HT. MIN.	4' O.C.	FULL & BUSHY
		VACCINIUM OVATUM	EVERGREEN HUCKLEBERRY	3 GAL./ 24" HT. MIN.	4' O.C.	FULL & BUSHY
		MAHONIA AQUIFOLIUM	OREGON GRAPE	3 GAL./ 24" HT. MIN.	4' O.C.	FULL & BUSHY
	1,822 SF	TYPE III LANDSCAPE BUFFER SHRUBS AND GROUNDCOVER	VISUAL BUFFER			
		GAULTHERIA SHALLON	SALAL	3 GAL./ 24" HT. MIN.	3' O.C.	FULL & BUSHY
		SPIRAEA DOUGLASII	DOUGLAS SPIRAEA	3 GAL./ 24" HT. MIN.	4' O.C.	FULL & BUSHY
		VACCINIUM OVATUM	EVERGREEN HUCKLEBERRY	3 GAL./ 24" HT. MIN.	4' O.C.	FULL & BUSHY
		ASARUM CAUDATUM	WILD GINGER	3 GAL./ 24" HT. MIN.	18" O.C.	FULL & BUSHY

GROUND COVERS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	COMMENTS
	307 SF	ASARUM CAUDATUM	BRITISH COLUMBIA WILD GINGER	1 GAL.	18" O.C.	
	13,715 SF	LAWN		HYDROSEED		

TYPE III BUFFER SAMPLE PLANTING AREA



TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	COMMENTS
	1	RHAMNUS PURSHIANA	CASCARA	1.5" CAL./10` HT. MIN.	AS SHOWN	WELL-BRANCHED
	1	THUJA PLICATA	WESTERN RED CEDAR	6` - 8` MIN HT.	AS SHOWN	WELL-BRANCHED

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	COMMENTS
	3	GAULTHERIA SHALLON	SALAL	3 GAL./24" HT. MIN.	3` O.C.	FULL & BUSHY
	3	SPIRAEA DOUGLASII	WESTERN SPIREA	3 GAL./24" HT. MIN.	4` O.C.	FULL & BUSHY
	5	VACCINIUM OVATUM	EVERGREEN HUCKLEBERRY	3 GAL./24" HT. MIN.	4` O.C.	FULL & BUSHY

GROUND COVERS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	COMMENTS
	307 SF	ASARUM CAUDATUM	BRITISH COLUMBIA WILD GINGER	1 GAL.	18" O.C.	

PROJECT NOTES

1. ALL VEGETATION TO BE INSTALLED PER APPLICABLE CITY OF ISSAQUAH ZONING CODE (SECTION 18.12) REQUIREMENTS.
2. STREET TREES TO BE MAINTAINED BY HOME OWNERS ASSOCIATION.
3. STREET TREE PLANTING:
   STREET TREES SHALL HAVE A MINIMUM OVERHEAD CLEARANCE OF SEVEN (7) FEET OVER PEDESTRIAN PATHWAYS AND FOURTEEN (14) FEET OVER STREETS AT MATURITY. STREET TREES SHALL BE CENTERED A MINIMUM OF THREE (3) FEET FROM CURBS AND TWO (2) FEET FROM SIDEWALKS OR AS OTHERWISE APPROVED BY THE CITY.

TREE DENSITY CALCULATIONS

DEVELOPABLE SITE AREA:	10.67 ACRES (464,937 SF)
MINIMUM TREE DENSITY REQUIREMENTS (IMC 18.12.1370): (2 SIGNIFICANT TREES PER 5,000 SF)	186 TREES (464,937/5,000 SF = 92.99 * 2 TREES = 185.97 TREES = 186 TREES)
TOTAL PROPOSED TREE PLANTING:	186 TREES
STREET TREES:	26 TREES
TYPE III BUFFER TREES:	9 TREES
OTHER PROPOSED TREES:	151 TREES

ZONING: SF-E
RETENTION REQUIRED: 30% OF THE TOTAL CALIPER (DBH) OF ALL SIGNIFICANT TREES IN DEVELOPABLE SITE AREA
PROPOSED: 38.71% TREE RETENTION PLAN FOR THE DEVELOPABLE SITE AREA

(1) REPLACEMENT TREE FOR EVERY (6) INCHES OF CALIPER AT DBH OF TREES REMOVED IF REMAINING TREE DENSITY IS BELOW THE MINIMUM REQUIREMENTS IN IMC 18.12.1370, MINIMUM TREE DENSITY REQUIREMENTS. THE MINIMUM TREE DENSITY REQUIREMENT HAS BEEN MET.

GENERAL LANDSCAPE NOTES

9. LANDSCAPING

9.1. LANDSCAPING REVIEW IN RIGHT-OF-WAY (ROW) IS LIMITED TO UTILITY CONFLICTS AND TRESS IN ACCORDANCE WITH THE MASTER STREET TREE PLAN, COMPLIANCE WITH CONDITIONS IN THE LAND USE PERMIT, ROADS, SITE DISTANCE VISIBILITY, AND CONSISTENCY WITH ISSAQUAH MUNICIPAL CODE STANDARDS. THE SAME APPLIES TO MINI PARKS, UNLESS PLAY EQUIPMENT IS INVOLVED WHICH WOULD BE REVIEWED FOR SAFETY.

9.2. INCLUDE ABOVEGROUND UTILITIES (I.E. LIGHT POLES, HYDRANTS, STREET SIGNAGE, ETC.) ON ALL PLAN SUBMITTALS. PLACE THE FOLLOWING NOTES ON ALL LANDSCAPE PLANS SUBMITTED FOR CITY OF ISSAQUAH:

9.2.1. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE LOCATIONS OF ALL UNDERGROUND UTILITIES PRIOR TO COMMENCEMENT OF WORK; AND TO PROTECT SAID UTILITIES FROM DAMAGE DURING PLANT INSTALLATION.

9.2.2. CONTACTOR SHALL OBTAIN AND PAY FOR ALL NECESSARY PERMITS AND FEES AS REQUIRED BY APPLICABLE CODES AND ORDINANCES FOR THIS WORK.

9.2.3. CONTRACTOR SHALL PROVIDE PROTECTION OF ALL PROPERTY, PERSONS, WORK IN PROGRESS, STRUCTURES, UTILITIES, WALKS, CURBS AND PAVED SURFACES DURING THE INSTALLATION OF LANDSCAPE AND IRRIGATION WORK.

9.2.4. CONTRACTOR SHALL KEEP ALL AREAS OF WORK CLEAN, NEAT AND ORDERLY AT ALL TIMES. ALL PAVED AREAS ARE TO BE CLEANED FOLLOWING PLANTING AND MAINTENANCE ACTIVITIES.

9.2.5. CONFLICTS BETWEEN APPROVED PLANTING PLANS, LANDSCAPE PERFORMANCE STANDARDS AND EXISTING FIELD CONDITIONS SHALL BE IDENTIFIED TO THE DIRECTOR OR DESIGNEE PRIOR TO PLANTING.

9.2.6. PROPOSALS FOR PLANT SUBSTITUTIONS, LOCATION ADJUSTMENTS, SOIL AMENDMENTS OR ANY VARIATIONS FROM THE APPROVED PLANS SHALL REQUIRE PRIOR APPROVAL BY THE DIRECTOR OR DESIGNEE.

9.2.7. SOILS LOCATED IN PLANTING AREAS THAT HAVE BEEN COMPACTED TO A DENSITY GREATER THAN THAT PENETRABLE WITH A HAND SHOVEL (APPROX. 85%), SHALL BE LOOSENED TO INCREASE AERATION FOR A MINIMUM DEPTH OF 18 INCHES FOR THE ENTIRE AREA OF THE COMPACTED SOILS UTILIZED FOR LANDSCAPE PURPOSES. IMPORTED TOPSOIL SHALL BE INCORPORATED INTO LOOSENED SUB GRADE TO A MINIMUM DEPTH OF 6".

9.2.8. VERIFICATION OF THE NEED FOR ADDITIONAL SOIL AMENDMENTS WILL BE MADE AT THAT TIME. RECOMMENDED AMENDMENTS SHALL BE APPLIED PRIOR TO PLANTING (SEE CITY OF ISSAQUAH CODE REQUIREMENTS REGARDING SOIL AMENDMENTS HERON).

9.2.9. USE OF FERTILIZER, ORGANIC OR SYNTHETIC SLOW-RELEASE TYPE, AND PESTICIDES OF ANY KIND SHALL ONLY BE PERMITTED BY THE DIRECTOR OR DESIGNEE. PERMITTED APPLICATIONS OF PESTICIDES SHALL BE APPLIED BY LICENSED APPLICATORS ONLY. ALL USE OF FERTILIZERS, PESTICIDES, AND HERBICIDES SHALL COMPLY WITH BEST MANAGEMENT PRACTICES FOR ISSAQUAH HIGHLANDS. APPLICATIONS OF ALL PESTICIDES, HERBICIDES, AND FERTILIZERS SHALL BE MADE IN A MANNER THAT WILL INHIBIT THEIR ENTRY INTO WATERWAYS, WETLANDS, AND STORM DRAINS.

9.2.10. ALL PLANT MATERIAL SHALL MEET CURRENT AMERICAN ASSOCIATION OF NURSERYMAN STANDARDS FOR NURSERY STOCK (ANSI 260.1) REQUIREMENTS. PLANT SIZES FOR BUFFERS AND PARKING LOTS SHALL CONFORM TO STANDARDS OUTLINED IN ISSAQUAH MUNICIPAL CODE SECTION 18.12.140.

9.2.11. ALLOW 24 HOURS MINIMUM NOTIFICATION FOR INSPECTION REQUEST. PLANT MATERIAL THAT HAS BEEN APPROVED FOR INSTALLATION SHALL BE PLANTED WITHIN 24 HOURS. INSTALLATION SHALL NOT BE CONDUCTED UNDER ADVERSE WEATHER CONDITIONS WITHOUT PRIOR APPROVAL OF THE DIRECTOR OR DESIGNEE. PLANT MATERIAL THAT CANNOT BE PLANTED WITHIN ONE DAY FOLLOWING ARRIVAL SHALL BE HEELED-IN, KEPT MOIST AND PROTECTED AT ALL TIMES FROM EXTREME WEATHER CONDITIONS. PLANTS SHALL BE STORED AT THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

9.2.12. TREE PITS SHALL BE A MINIMUM OF THREE TIMES (3X) THE DIAMETER OF THE TREE'S ROOT MASS. ADDITIONAL AERATION MAY BE REQUIRED AS DIRECTED BY THE DIRECTOR OR DESIGNEE. ADD WATER TUBES TO THE TREE PLANTINGS IN PAVED AREAS.

9.2.13. STREET TREES SHALL BE SYMMETRICAL AND UNIFORM IN APPEARANCE, SIZE AND STRUCTURE.

9.2.14. STREET TREE AND SHRUB SETBACKS SHALL BE CONSISTENT WITH ADOPTED CITY OF ISSAQUAH STREET STANDARDS, AND MEET THE FOLLOWING GENERAL REQUIREMENTS UNLESS OTHERWISE DIRECTED BY THE DIRECTOR OR DESIGNEE:

9.2.15. TREES WILL NOT BE PLANTED IN LOCATIONS THAT COULD LEAD TO ROOTS DAMAGING SIDEWALKS OR CURBING.

9.2.16. STREET TREES SHALL HAVE A MINIMUM OVERHEAD CLEARANCE OF SEVEN (7) FEET OVER PEDESTRIAN PATHWAYS AND FOURTEEN (14) FEET OVER STREETS AT MATURITY. STREET TREES SHALL BE CENTERED A MINIMUM OF THREE (3) FEET FROM CURBS AND TWO (2) FEET FROM SIDEWALKS.

9.2.17. TURF AREAS SHALL CONSIST OF A LOW WATER USE SEED MIX THAT IS WELL ADAPTED TO THE REGION. SPECIFIC SEED SELECTION SHALL BE CHOSEN BASED ON SOILS, MAINTENANCE EXPECTATIONS AND PROPOSED USE OF THE PLANTING AREA.

9.2.18. PLANT MATERIALS SHALL BE GUARANTEED FOR A PERIOD OF THREE YEARS TO REMAIN IN A HEALTHY AND ATTRACTIVE MANNER. TO INSURE THIS OCCURS THE APPLICANT SHALL PROVIDE A CASH DEPOSIT OF 50% OF THE VALUE OF THE PLANT MATERIAL AND IRRIGATION PRIOR TO CONSTRUCTION PERMIT SIGN-OFF. PLANT MATERIAL THAT HAS LOST MORE THAN 30 PERCENT OF ITS NORMAL FOLIAGE SHALL BE REPLACED AS DIRECTED BY THE DIRECTOR OR DESIGNEE.

9.2.19. ALL PLANTING AREAS TO RECEIVE 2" DEPTH APPROVED MULCH.

9.2.20. LANDSCAPE PERFORMANCE BOND SHALL NOT BE RELEASED WITHOUT CITY OF ISSAQUAH ACCEPTANCE.

9.2.21. THE CITY SHALL APPROVE PLANT LAYOUT ALONG RENTON-ISSAQUAH ROAD SE STREET FRONTAGE PRIOR TO PLANT INSTALLATION. CALL FOR INSPECTION AT LEAST 48 HOURS IN ADVANCE OF PLANTING.

9.2.22. PRIOR TO INSTALLATION OF ANY PLANT MATERIAL, DOCUMENTATION SHALL BE PROVIDED TO THE CITY THAT THE ASSOCIATED IRRIGATION PLAN HAS BEEN REVIEWED BY THE CITY OF ISSAQUAH (OR EQUIVALENT AS DETERMINED BY THE DIRECTOR OR DESIGNEE) AND ARE CONSISTENT WITH THE WATER BUDGET INDICATED IN THE PLAN SET; AND, ARE CONSISTENT WITH THE CITY OF ISSAQUAH WATER CONSERVATION STANDARDS.

9.2.23. CONTACT THE CITY OF ISSAQUAH PERSONNEL FOR ASSISTANCE OR INFORMATION.

STANDARD PLANTING BED PREPARATION NOTES

1. SUBGRADE SHALL BE A MINIMUM OF EIGHT (8) INCHES BELOW FINISH GRADE. SUBSTANDARD SOILS SHALL BE REMOVED PRIOR TO ADDING AMENDMENTS.
2. INCORPORATE WATER AND NUTRIENT HOLDING MATERIALS INTO SOIL AS DEEP AS POSSIBLE (A MIN. OF 12"). USE FULLY COMPOSTED ORGANIC MATERIAL.
3. SOILS WITHIN PLANTERS SHALL BE A GROWING MEDIUM THAT IS A COMBINATION OF ORGANIC AND INORGANIC MATTER SUCH AS AMERICAN HYDROTECH'S LITETOP GROWING MEDIUM.

CITY OF ISSAQUAH SOIL AMENDMENT REQUIREMENTS

SOIL AMENDMENTS – COMPOST, TOPSOIL AND SEED MIX SPECIFICATIONS: ALL NEW LANDSCAPE AREAS SHALL BE REQUIRED TO AMEND SOILS TO IMPROVE SOIL HEALTH AND NUTRIENT AVAILABILITY, INCREASE POROSITY, INFILTRATION AND MOISTURE HOLDING CAPACITY AND SHALL MEET MINIMUM SPECIFICATIONS FOR SOILS, COMPOST, MULCHES AND SEED MIXES.

1. SUBGRADE SHALL BE A MINIMUM OF EIGHT (8) INCHES BELOW FINISH GRADE. SUBSTANDARD SOILS SHALL BE REMOVED PRIOR TO ADDING AMENDMENTS.
2. A SOILS ANALYSIS SHALL BE COMPLETED FOR ALL NEW PLANTING AREAS AND SHALL INCLUDE:
   A. A DETERMINATION OF SOIL TEXTURE, INDICATING PERCENTAGE OF ORGANIC MATTER.
   B. AN APPROXIMATED SOIL INFILTRATION RATE EITHER MEASURED OR DERIVED FROM SOIL/TEXTURE/INFILTRATION RATE TABLES.
   C. A MEASURE OF PH VALUE.
3. SOILS FOR USE IN PROJECTS APPLYING LOW IMPACT DEVELOPMENT (LID) STANDARDS SHALL FOLLOW THE LID TECHNICAL GUIDANCE MANUAL FOR PUGET SOUND, SECTION 6.2, AMENDING CONSTRUCTION SITE SOILS.
4. FOR SOILS THAT WILL NOT ADEQUATELY PERCOLATE TO PROVIDE PROPER DRAINAGE FOR PLANT MATERIALS, A PLAN TO CORRECT THE SITUATION SHALL BE DEVELOPED BY THE LANDSCAPE ARCHITECT AND APPROVED BY THE PLANNING DIRECTOR/MANAGER.
5. GUIDELINES FOR MEETING MINIMUM STANDARDS ARE AVAILABLE AT THE PERMIT CENTER AND SHALL FOLLOW THE WASHINGTON STATE UNIVERSITY KING COUNTY EXTENSION SERVICES GUIDELINES FOR SOIL CONDITIONS AND PLANT SELECTION.

NO.	REVISIONS	DATE
1	PER CITY COMMENTS	1/7/19
2	PER CITY COMMENTS	6/14/19
3	PER CITY COMMENTS	8/30/19
4	PER CITY COMMENTS	10/1/19
5	PER CITY COMMENTS	11/8/19

STATE OF WASHINGTON REGISTERED LANDSCAPE ARCHITECT
LINDSEY BENNETT SOLORIO
CERTIFICATE NO. 1357
04/17/2020

CORE DESIGN
12100 NE 195th St, Suite 300 Bothell, Washington 98011 425.885.7877
CIVIL ENGINEERING
LANDSCAPE ARCHITECTURE
PLANNING
SURVEYING

PRELIM. LANDSCAPE SCHEDULE AND NOTES
TIBBETTS CROSSING
STEVE BURNSTEAD CONSTRUCTION, LLC
11980 NE 24TH STREET SUITE 200
BELLEVUE, WA 98005

DATE	AUGUST 2018
DESIGNED	SPENCER BUSSON
DRAWN	SPENCER BUSSON
APPROVED	LINDSEY B. SOLORIO, P.L.A.
	SHERI H. MURATA, P.E. PROJECT MANAGER

SHEET L2.02 OF 14

PROJECT NUMBER 17127

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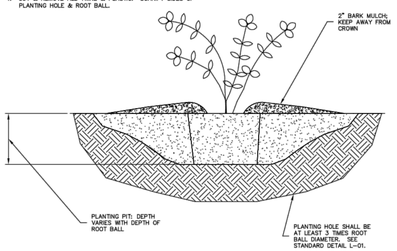
NOTES:
1. CUT & REMOVE ALL TWINE & PLASTIC. SCARIFY SIDES OF PLANTING HOLE & ROOT BALL.



APPROVED	DEPT.	DATE

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NO SCALE

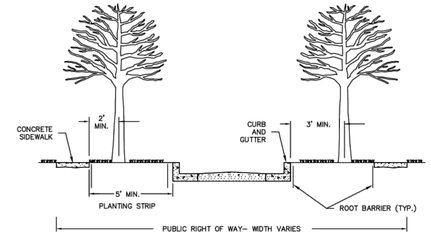
CITY OF ISSAQUAH PUBLIC WORKS DEPARTMENT APRIL 2010

TYPICAL SHRUB GROUND COVER PLANTING

NOTE: THE ORIGINAL IS APPROVED FOR PUBLICATION BY PARKS DEPARTMENT AND FILED AT THE CITY OF ISSAQUAH PUBLIC WORKS ENGINEERING OFFICE.

STANDARD DETAIL NO. L-04

REV:



NOTES:
1. TREE SPACING IS DEPENDANT ON THE SIZE AND TYPE OF STREET TREE USED. SEE CONTRACT FOR SPACING.
2. TREES SHALL NOT BE PLACED IN SIGHT DISTANCE TRIANGLES PER MOST CURRENT VERSION OF AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) OR CITY STANDARDS.
3. COORDINATE WITH TRAFFIC SIGNAL ENGINEER SO THAT TREES DO NOT OBSTRUCT OPERATIONS OF TRAFFIC SIGNAL SYSTEMS.
4. PLANTING STRIP IRRIGATION SYSTEMS SHALL MEET IRRIGATION STANDARD AND INCORPORATE LATEST WATER CONSERVATION TECHNIQUES.
5. STREET TREES SHALL HAVE A MINIMUM OVERHEAD CLEARANCE OF SEVEN (7) FEET OVER PEDESTRIAN PATHWAYS AND FOURTEEN (14) FEET OVER STREETS. STREET TREES SHALL BE CENTERED A MINIMUM OF THIRTY (30) FEET FROM INTERSECTIONS, TWENTY (20) FEET FROM STREET LIGHTS, THREE (3) FEET FROM CURBS AND TWO (2) FEET FROM SIDEWALKS OR AS OTHERWISE APPROVED BY THE CITY.
6. STREET TREES SHALL BE PLANTED IN A PLANTING STRIP WITH A MINIMUM OF FIVE (5) FEET BETWEEN THE SIDEWALK AND THE BACK OF THE CURB
7. TREE PIT AREA SHALL BE A MINIMUM OF 24 SQUARE FEET.
8. ROOT BARRIER SHALL EXTEND A MINIMUM OF 5 FEET BEYOND TREE (REFER TO MANUFACTURERS DETAIL).

APPROVED	DEPT.	DATE

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NO SCALE

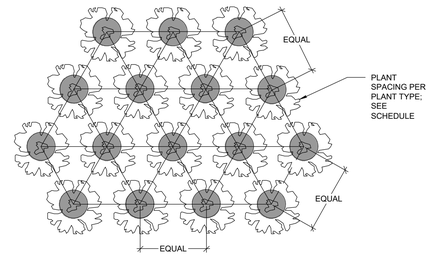
CITY OF ISSAQUAH PUBLIC WORKS DEPARTMENT APRIL 2010

TYPICAL STREET TREE LOCATION REQUIREMENTS

NOTE: THE ORIGINAL IS APPROVED FOR PUBLICATION BY PARKS DEPARTMENT AND FILED AT THE CITY OF ISSAQUAH PUBLIC WORKS ENGINEERING OFFICE.

STANDARD DETAIL NO. L-03

REV:

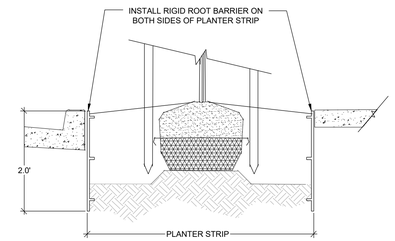


NOTE:
FOR THE SPACING REQUIREMENT(S): SEE THE 'SPACING' COLUMN WITHIN THE 'GROUNDCOVER' SECTION OF THE 'PLANT SCHEDULE.'

THIS DESIGNATION REPRESENTS THE SPACE BETWEEN EACH GROUNDCOVER AND ITEMS SUCH AS PATHS, DRIVES, ACCESS ROUTES, AND ETC. BASED ON THE PROPOSED AREA(S) SPECIFIED ON THE PLAN, THE REQUIRED SPACING MAY NEED TO VARY WHILE REMAINING EQUALLY SPACED THROUGHOUT SAID AREA(S).

DETAIL: PLANTING GROUNDCOVER SPACING

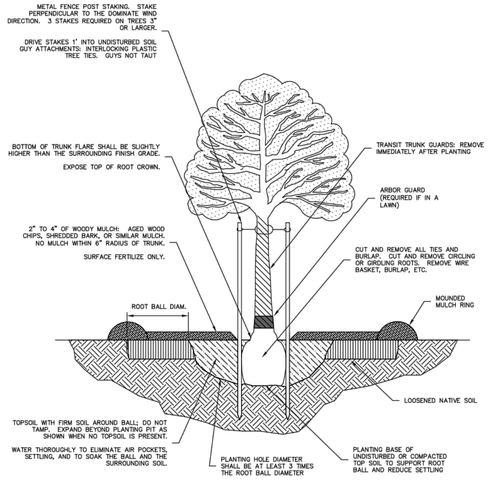
NOT TO SCALE



NOTE:
1. INSTALL PRODUCT PER MANUFACTURER'S SPECIFICATIONS.
2. INSTALL PRODUCT A MINIMUM OF 3' BEYOND CENTER OF TREE IN EACH DIRECTION PARALLEL TO UTILITY LINE.
3. ALL TREES LOCATED WITHIN CLOSE PROXIMITY TO UTILITIES TO RECEIVE ROOT BARRIER.

DETAIL: ROOT BARRIER

NOT TO SCALE



APPROVED	DEPT.	DATE

NOTES:
1. TREE LOCATION TO BE VERIFIED NOT TO CONFLICT WITH UNDERGROUND UTILITIES A MIN. OF 3 FT CLEAR ZONE EACH SIDE.

NO SCALE

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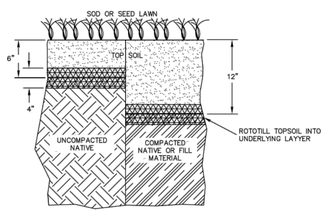
CITY OF ISSAQUAH PUBLIC WORKS DEPARTMENT APRIL 2010

TREE PLANTING DETAIL

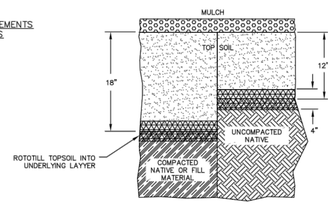
NOTE: THE ORIGINAL IS APPROVED FOR PUBLICATION BY PARKS DEPARTMENT AND FILED AT THE CITY OF ISSAQUAH PUBLIC WORKS ENGINEERING OFFICE.

STANDARD DETAIL NO. L-01

REV:



TOP SOIL REQUIREMENTS FOR LAWNS



TOP SOIL REQUIREMENTS FOR TREE AND SHRUB BEDS

APPROVED	DEPT.	DATE

NOTES:
1) ALL PLANT MATERIALS TO MEET THE AMERICAN STANDARD FOR NURSERY STOCK, ANSI Z80.1–1900 OR MOST CURRENT VERSION.
2) PLANT, MAINTAIN AND WARRANTY AS PER SPECIAL PROVISIONS.
3) DO NOT SUBSTITUE SPECIES WITHOUT ENGINEER APPROVAL.

NO SCALE

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CITY OF ISSAQUAH PUBLIC WORKS DEPARTMENT APRIL 2010

TOP SOIL REQUIREMENTS FOR COMPACTED AND NON-COMPACTED SOILS

NOTE: THE ORIGINAL IS APPROVED FOR PUBLICATION BY PARKS DEPARTMENT AND FILED AT THE CITY OF ISSAQUAH PUBLIC WORKS ENGINEERING OFFICE.

STANDARD DETAIL NO. L-02

REV:

NO.	REVISIONS	DATE
1	PER CITY COMMENTS	1/7/19
2	PER CITY COMMENTS	6/14/19
3	PER CITY COMMENTS	8/30/19
4	PER CITY COMMENTS	10/1/19
5	PER CITY COMMENTS	11/8/19

STATE OF WASHINGTON REGISTERED LANDSCAPE ARCHITECT
LINDSEY BENNETT SOLORIO
CERTIFICATE NO. 1355
04/17/2020

CORE DESIGN
12100 NE 195th St, Suite 300 Bothell, Washington 98011 425.885.7877
CIVIL ENGINEERING
LANDSCAPE ARCHITECTURE
PLANNING
SURVEYING

PRELIMINARY LANDSCAPE DETAILS
TIBBETTS CROSSING

STEVE BURNSTEAD CONSTRUCTION, LLC
11980 NE 24TH STREET SUITE 200
BELLEVUE, WA 98005

DATE	AUGUST 2018
DESIGNED	SPENCER BUISSON
DRAWN	SPENCER BUISSON
APPROVED	LINDSEY B. SOLORIO, P.L.A.
	SHERI H. MURATA, P.E. PROJECT MANAGER

SHEET L2.31 OF 14

PROJECT NUMBER 17127

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Project Narrative

Preliminary Plat of Tibbetts Crossing

(Formerly known as "Silverado")

Site Information

Parcel	Parcel size	Street Address	Zoning
2924069041	**21.94 acres**	**7932 Renton-Issaquah Road, SE**	**SF-E**

Current Use:

The site is currently a single family residence with various outbuildings, and is owned by the applicant.

Prior Site Approvals:

The site was approved for Cluster Housing under Development Agreement DA16-0002 by the City of Issaquah on December 22nd, 2016 for up to 20 single family lots. Two lots will be deed restricted for affordable housing. Another parcel will be encumbered by a NGPE that will also have a relocatable Public Recreation Trail Easement to be granted to the City of Issaquah.

Special Site Features:

The site is divided into 2 different features: The lower (Western) section is a former pasture and working farm that is gently sloping with few trees, a vacant house and several empty agricultural buildings. The upper (Eastern) section is forested with slopes varying from mild to several pockets that meet Issaquah's definition of steep. Tibbetts Creek (a class 2 stream), divides the site between the lower and upper sections, with a Class 2 stream branch also bordering the Southern boundary edge. There are several identified wetlands located within the site. The first wetland (Wetland A) is small a Category IV wetland located adjacent to the existing project entrance. The second wetland (Wetland B) is a larger Category III wetland located at the NE corner of the site. The third wetland (Wetland C) is a Category III wetland, which is a larger Category III wetland located adjacent to Tibbetts creek along the Northwestern side of the creek. The final wetland (Wetland D) is a Category III wetland located along the Southeast side of the creek. Please reference preliminary plans and Critical Area Report submitted as part of the application for more information on the size and location of these features.

Proposed Use and Lots:

The proposed Plat will be subdivided into 20 single family lots. All interior roads will be privately owned and maintained. Access to SR900 will be from the intersection with NW Talus Drive. A single lane bridge with sidewalk will be constructed across Tibbetts Creek to access 4 single family lots to be located on the East side of the creek. Pedestrian access to a future Squak Mountain trail system will be provided with

the creek crossing. Final building footprints, layout and configurations will be provided with Building Permit submittals. A circular road accessing lots 1 – 13 will provide guest parking and a large open space / common area for community gathering.

Proposed Improvements:

Each lot will be provided with a new water service and new private side sewer connection. There are 2 detention vaults proposed to detain and treat pollution-generating runoff from the site. These will be located in Tract D, as well as under the roadway east of the bridge crossing. Additionally, basic dispersion trenches and several infiltration trenches will be installed at various locations to manage roof runoff from proposed buildings. Frontage improvements will include a new entrance from SR900. Internal roads will be two-lane (single lane at bridge crossing), with sidewalk on one side. A private modular sewer lift station will be installed at Tract D to provide force-main connection to public sewer in SR900.

CITY OF ISSAQUAH

Land Use Application #607149 - Tibbetts Crossing Prelim Plat

Applicant

First Name	Last Name	Company Name
Leo	Suver	Steve Burnstead Construction, LLC

Number	Street	Apartment or Suite Number	E-mail Address
11980	NE 24th Street	200	leo@burnstead.com

City	State	Zip	Phone Number	Extension
Bellevue	WA	98005	(425) 454-1900	218

Contractor

Company Name

Number	Street	Apartment or Suite Number

City	State	Zip	Phone Number	Extension

State License Number	License Expiration Date	UBI #	E-mail Address

Project Location

Number	Street	Floor Number	Suite or Room Number
7932	RENTON-ISSAQUAH RD SE		

City	Zip Code	County Parcel Number
ISSAQUAH	98027	2924069041

Associated Building Permit Number

Tenant Name

Additional Information (i.e. equipment location or special instructions).

Work Location

Property Owner

First Name	Last Name or Company Name
*	STEVE BURNSTEAD CONSTRUCTIO

Number	Street	Apartment or Suite Number
11980	NE 24TH ST	

City	State	Zip
BELLEVUE	WA	98005

Certification Statement - The applicant states:

I certify that I am the owner of this property or the owner's authorized agent. If acting as an authorized agent, I further certify that I have full power and authority to file this application and to perform, on behalf of the owner, all acts required to enable the jurisdiction to process and review such application. I have furnished true and correct information. I will comply with all provisions of law and ordinance governing this type of application. If the scope of work requires a licensed contractor to perform the work, the information will be provided prior to permit issuance.

Date Submitted: 9/24/2018 **Submitted By:** Leo Suver

CITY OF ISSAQUAH

Land Use Application #607149 - Tibbetts Crossing Prelim Plat

Project Contact

Company Name: Steve Burnstead Construction, LLC

Name: Leo Suver **Email:** leo@burnstead.com

Address: 11980 NE 24th Street 200 Bellevue WA 98005 **Phone #:** (425) 454-1900 218

Project Type	Activity Type	Scope of Work
Any Project Type	Land Division	Plat - Preliminary

Project Name: Tibbetts Crossing Prelim Plat

Description of Work: Clearing, grading and utilities associated with the infrastructure for 20 proposed lots.

Project Details

Project Information

Use (s) - proposed	20 single family homes with associated roads, utilities and two detention vaults.
Use - existing	The existing parcel is forested on the east half, with a single family residence, accessory structures, grass, and scattered trees on the west half.

Critical Area Information

Streams

Wetland

Clearing and Grading Information

Square feet of new impervious surface	84,187
Square feet of replaced impervious surface	14,092
Square feet of total impervious surface	98,279

RESOLUTION NO. 2016-20

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ISSAQUAH, WASHINGTON, AUTHORIZING THE MAYOR TO EXECUTE THE SILVERADO DEVELOPMENT AGREEMENT.

WHEREAS, Silverado Senior Living Holdings (Silverado) submitted an application for a Development Agreement (Application DA16-0002) to develop a clustered subdivision of a 21.94-acre property zoned SF-E, Single Family-Estates, into a maximum of 20 dwelling units, with two parcels that will be set aside and dedicated to the City for future Affordable Housing units, a bridge, trail easements and Native Growth Protection Easements.

WHEREAS, Silverado applied for a Clustered Housing / Development Agreement that allows for lots less than 35,000 square feet and attached duplex units not to exceed the allowable density of the Single Family Estates (SF-E) zone; and

WHEREAS, a Development Agreement is required for clustered housing sites over five acres in size; and

WHEREAS, State Environmental Policy Act (SEPA) review of this proposal resulted in a Mitigated Determination of Nonsignificance (MDNS) being issued on July 15, 2016; and

WHEREAS, a Public Hearing by the Development Commission was held on July 20, 2016 and all who wanted to give testimony were afforded the opportunity, and

WHEREAS, the City Council's Land and Shore Committee reviewed the project on October 6, 2016; November 3, 2016; and December 1, 2016 and all who wanted to make comments were afforded the opportunity; and

WHEREAS, the City desires to adopt the Silverado Development Agreement; NOW, THEREFORE,

THE CITY COUNCIL OF THE CITY OF ISSAQUAH, WASHINGTON, HEREBY RESOLVES AS FOLLOWS:

Section 1. The City Council hereby authorizes the Mayor to execute the Silverado Development Agreement, attached hereto as Exhibit A.

Section 2. This resolution shall be effective immediately upon passage. The City Clerk is directed to record the Development Agreement with the King County Recorder's Office, as required by RCW 36.70B.190.

PASSED by the City Council this 19th day of December, 2016.

Stacy Goodman

STACY GOODMAN, COUNCIL PRESIDENT

APPROVED by the Mayor this 19th day of December, 2016.

FRED BUTLER, MAYOR

ATTEST:

Christine L. Eggers

CHRISTINE EGGERS, CITY CLERK

APPROVED AS TO FORM:

OFFICE OF THE CITY ATTORNEY

RESOLUTION NO: 2016-20
AGENDA BILL NO: AB 7196
DATE PASSED: Dec. 19, 2016

Exhibit A: Draft Development Agreement

December 14, 2016

CLUSTER HOUSING DEVELOPMENT AGREEMENT BETWEEN THE CITY OF ISSAQUAH AND SILVERADO SENIOR LIVING HOLDINGS, INC.

This Agreement ("Agreement") is made this ___ day of ____, 2016 by and between the City of Issaquah ("Issaquah" or the "City"), a Washington municipal corporation, and Silverado Senior Living Holdings, Inc., a Delaware corporation ("Owner"). The City and Owner may also be referred to individually as a Party and collectively as the Parties.

RECITALS

A. Owner owns or is about to acquire certain real property (the "Property") located at 7932 Renton-Issaquah Road SE in the City of Issaquah, County of King, and State of Washington. The Property consists of King County Assessor Parcel No. 2924069041, the legal descriptions of which are attached hereto as **Attachment 1** and incorporated herein.

B. The Property consists of approximately 21.94 acres, is designated Low Density Residential in the Comprehensive Plan, and is currently zoned Single Family Estates – 1.24 du/acre.

C. Owner wishes to build a cluster housing development on the Property of up to 20 dwelling units. Two lots, to be dedicated to the City, will be deed restricted for Affordable Housing. Another parcel ("Open Space Tract") will be encumbered by a Native Growth Protection Easement (NGPE). The Open Space Tract will be owned and maintained by the Homeowners Association. Public Recreation Trail Easements, within the Open Space Tract, shall be granted to the City to accommodate public trail connections.

D. Parking and Access. Access shall be provided from a private road accessing from SR900. The private road shall be to the benefit of the buildable parcels and each shall have covenanted rights to its use. Parking shall meet Code Requirements and shall be provided at a ratio of two (2) stalls for each dwelling unit. An additional maximum of 2 parking stalls per unit may be added to accommodate guest parking.

E. IMC 18.07.420, the City's cluster housing ordinance, is intended to allow for the maximum density authorized by the underlying zoning while also preserving critical areas through lot and setback reductions and other adjustments to the requirements of the underlying zoning.

F. IMC 18.07.420.C requires a development agreement for cluster housing developments located on five (5) or more acres of land.

G. The City is authorized to enter into a development agreement with those who own or control property within its jurisdiction pursuant to RCW 36.70B.170-.210 and IMC 18.07.420.C.

H. The City will review the preliminary plat and the cluster housing development that is the subject of this Agreement and will issue a SEPA Determination, prepared pursuant to the State Environmental Policy Act, RCW 43.21C.

I. Subject to the implementation of the provisions of this development agreement and applicable development regulations, the proposed cluster housing development will be consistent with the general purpose, goals, objectives and standards of the Comprehensive Plan and other applicable regulations; will be served by adequate facilities; and will not have a substantial impact on adjacent properties, the community or other elements affecting the general welfare.

AGREEMENT

In consideration of the mutual benefits and agreements set forth herein, the sufficiency of which is hereby acknowledged, the Parties agree as follows:

1. **Recitals.** The Recitals are a part of this Agreement and are incorporated herein.

2. **Cluster Housing Development.** Maximum allowable density on the Property shall not exceed 20 dwelling units. The clustered housing development will consist of individual platted lots within the developable areas identified on **Attachment 2**, including two parcels deeded to the City for affordable housing. The Open Space Tract will be owned in common by the neighborhood and encumbered by a Native Growth Protection Easement.

3. **Development Standards.** The preliminary and final plat associated with the Development Agreement will meet all of the Cluster Housing development standards per IMC 18.07.420.

4. **Open Space Tracts.** The open space tract, as shown on the Developable Area Plan (**Attachment 2**) and consisting of approximately 763,595 SF, will be preserved as a Native Growth Protection Easement. The open space tract constitutes 79.9% of the net site area.

Neighborhood Trails
Neighborhood trails through the HOA-owned open space may be required as part of the platting process.

Regional Trail Easement
A relocatable recreational trail easement (Similar to Attachment 3) through the HOA-owned open space will be conveyed to the City by the Owner as part of the platting process. The preliminary location of the easement shall be determined during the platting process but the easement shall provide that it may be relocated within the open space area at the City's discretion at such time as the City decides to construct the trail or cause the trail to be constructed and connected to other trails

as provided in this section. The easement will be conveyed to the City by language approved by the City. The easement is for a regional trail, or trails, to connect SR900 to the eastern boundary and the King County Lake Sammamish to Cedar River Trail; and/or, the northern and southern boundaries, as generally shown in Exhibit 2. The final easement shall be reviewed and approved by the City Council prior to its recording.

5. **Sensitive Area Tracts.** Approximately 11.21 acres of the Property contains wetlands, streams, steep slopes and their buffers and will be located in a Native Growth Protection Easement as depicted on the Developable Area plan (**Attachment 2**).

6. **Capital Facilities**.

a. Roads: Access to the proposed plat will be provided from Renton-Issaquah Road SE (SR 900) in an easterly direction at an existing signalized intersection with NW Talus Drive existing on the opposite side (west) of Renton-Issaquah Road SE. The existing signal will be modified by the Owner to accommodate access to the new plat. Internal vehicle routes will be designated as private roads with access granted via recorded easement descriptions. Maintenance of private roads will be performed by the Homeowners Association. Payment of dues will commence upon occupancy of the residential units for the affordable housing lots. Final road and access locations will be determined in the Preliminary Plat process.

b. Access to lots across Tibbetts Creek: Access to the lots on the east side of the creek will be served by a bridge. The Owner will be responsible for the construction of the bridge. The bridge will be for pedestrian and vehicular access to the eastern lots and the Open Space Tract. The bridge will be owned and maintained by the homeowner's association and will be constructed prior to final plat approval. The width of the bridge will be the minimum required to meet City standards.

c. Storm: The project will meet the City's stormwater requirements, including the recently-approved NPDES and LID requirements.

d. Water: Domestic and fire protection water will be supplied via a looped main with connections to the City water system within Renton-Issaquah Road SE and will be designed in accordance with City of Issaquah water system standards. All portions of the new water main will be accessible by backhoe/trackhoe for maintenance and/or repair. All portions of the public water main shall be contained in an easement to be conveyed to the City upon completion of the public water main and acceptance of the same by the City. Each dwelling unit (propose two per parcel) shall be individually metered for domestic use, fire sprinkler system and irrigation.

e. Sewer: Sewer flow will be collected from all parcels in the plat and routed via side sewer piping to a central wet well and lift station. All portions of the common sewer collection and conveyance piping shall be contained in easements to be conveyed to the City upon completion of the sewer system and acceptance of the same by the City.

f. Final storm, water, and sewer locations will be determined in the Preliminary Plat process.

7. **Transportation Concurrency.** Concurrency certificate for traffic was issued on May 17, 2016.

8. **Impact Fees.** Owner shall pay transportation, fire, park, police, general government and school impact fees in the amount in effect at time of Building Permit issuance for each structure.

9. **Subdivision.** Owner's agent has submitted an application for a cluster housing subdivision, which shall be consistent with and subject to this Agreement. Lot size and setback reductions shall be allowed in accordance with IMC 18.07.420. Owner shall also set aside and record a deed restriction or covenant by which 2 of lots will be dedicated to the City and developed in the future as affordable housing. Owner shall also record a deed restriction or covenant by which these parcels shall only be made available for (a) Affordable Housing, as defined in IMC18.21.020 or, (b) housing for persons with disabilities; as solely determined by the City. Final lot layout and locations will be determined in the Preliminary Plat process.

10. **Vesting.** Except as otherwise expressly provided herein, Owner is vested to and for the term of this Agreement (including any extensions) shall have the right to develop the Property in accordance with the substantive land use ordinances, policies and regulations as set out in the IMC, the Comprehensive Plan, and all other City land use requirements and regulations that are in effect at the time of submittal of a complete preliminary plat application for a cluster housing subdivision or upon full execution of this Agreement, whichever occurs first, including, without limitation, zoning regulations, environmental and other mitigation regulations and policies, SEPA policies and regulations. Owner shall not be vested, however, against any changes in regulations enacted by the City in response to the development moratorium imposed by City of Issaquah Ordinance No. 2778, including but not limited to, regulations concerning architectural review and urban design elements, affordable housing, mixed use, parking, and the vision for each zoning district. Owner shall also not be vested to any code which the City adopts pursuant to the State Building Code authorized by Chapter 19.27 RCW. Further, notwithstanding the provisions of this Section, the City shall have the authority to impose new or different regulations to the extent that such regulations are reasonably required to address a serious threat to public health and safety.

11. **SEPA Compliance.** The Parties acknowledge that the SEPA Determination fully and completely determined that there will be no probable significant adverse environmental impacts resulting from the cluster housing development on the Property. As required in the SEPA Mitigated Determination of Nonsignificance issued on July 15, 2016, additional SEPA review of the preliminary plat will be required to include evaluation of critical area impacts, traffic, and other applicable SEPA elements.

12. **General Provisions.**

a. Entire Agreement. This Agreement represents the entire agreement of the Parties with respect to the subject matter hereof. There are no other agreements, oral or written, except as expressly set forth herein. Any amendment to this Agreement shall be in writing and signed by all the Parties to this Agreement. Major revisions to the Development Agreement shall be approved by the City Council. Major revisions would include;

i. Increasing the number of dwelling units,

ii. Revisions to the Affordable Housing Agreement, and

iii. Changes to the Recreational Trail Easement.

All other proposed revisions will be considered administrative amendments and shall be reviewed and decided by the Development Services Director.

b. Covenants, Conditions and Restrictions. The cluster housing development will include and be subject to covenant, conditions and restrictions consistent with the provisions of this Agreement.

c. Term. The terms of this Agreement shall remain in effect for a period of five (5) years from the date that the Development Agreement is approved by the Issaquah City Council or from the date of the final plat approval for the cluster housing subdivision, whichever is later.

d. Agreement is Binding. The terms of this Agreement are intended to be and shall constitute a binding agreement and a covenant running with the land. The benefits and obligations herein shall benefit and bind the Parties and their successors and assigns in interest unless otherwise terminated by the Parties hereto.

e. Recording with King County. This Agreement and any amendments thereto shall be filed for recording with the King County Auditor.

f. Estoppel Certificate. Owner may, at any time, and from time to time, deliver written notice to the City requesting the City to certify in writing that, to the knowledge of the City (i) this Agreement is in full force and effect and a binding obligation of the Parties; (ii) this Agreement has not been amended or modified either orally or in writing, and if so amended, identifying the amendments; and (iii) the requesting Party is not in default in the performance of its obligations under this Agreement, or if in default, to describe therein the nature and amount of any such defaults. The City shall execute and return such certificate within thirty (30) days following the receipt thereof. The City shall have the right to execute any certificate requested by Owner. The City shall not have any liability to the requesting Party or to any third party for inaccurate information if it provides the estoppel certificate in good faith and with reasonable care.

g. Captions. The captions in this Agreement are intended for reference only and shall not be constructed to expand, limit or otherwise modify the terms and conditions of this Agreement.

h. Severability. If any provision of this Agreement is held invalid the remaining provisions shall continue in full force and effect.

i. Governing Law. This Agreement shall be governed and construed in accordance with the laws of the State of Washington.

j. Disputes. In any judicial action to enforce or determine the rights of the Parties under this Agreement the substantially prevailing Party shall be entitled to reasonable attorney's fees and costs, including fees and costs incurred in any appeal of any ruling of a lower court.

k. Specific Performance. In the event that any Party fails to perform as set forth in this Agreement, the non-defaulting Party or Parties shall be entitled to pursue specific performance against the defaulting Party. The Parties acknowledge that money damages and remedies at law generally are inadequate and specific performance and other non-monetary relief are particularly appropriate remedies for the enforcement of this Agreement and should be available to the Parties for the following reasons:

1. Money damages are inadequate to compensate the Parties for the unique benefits available through this Agreement; and

2. Due to the size, nature and scope of the development, it may not be practical or possible to restore the Property to its natural condition once implementation of this Agreement has begun.

l. Contact Information.

For the City of Issaquah:

_____

_____

_____

For Owner:

_____

_____

_____

Any Party may, upon ten (10) days written notice to the other Parties, substitute an alternative address for that listed above, either for a particular duration or permanently.

m. Authority to Execute. The Parties represent and warrant that they have the respective power and authority, and are duly authorized to execute, deliver, and perform all of the obligations under this Agreement.

n. Mutual Drafting and Construction. The Parties agree that each of them participated fully in the negotiation and drafting of this Agreement and the rules of construction of ambiguities against the drafter shall not apply to any Party.

o. Counterparts. This Agreement may be executed in counterparts, each of which shall be deemed an original.

Dated: _____, 2016

CITY OF ISSAQUAH, a Washington municipal corporation

By: _____ Date of Execution: _____

Its: _____

ATTEST:

_____
City Clerk

APPROVED AS TO FORM:

_____
City Attorney

STATE OF WASHINGTON)
: ss.
COUNTY OF _____)

I certify that I know or have satisfactory evidence that _____ is the person who appeared before me, and s/he acknowledged that s/he signed this instrument, on oath stated that s/he was authorized to execute the instrument and acknowledged it as the _____ of The City of Issaquah, a Washington municipal corporation, to be the free and voluntary act of such corporation for the uses and purposes mentioned in the instrument.

Dated this ____ day of _____, 2016.

_____

[Signature of Notary]

_____

[Print Name of Notary]

Notary Public in and for the State of Washington, residing at _____.

My commission expires: _____.

Paul Mullin
Silverado Senior Living Holdings, Inc.:

_____

Date: _____

STATE OF WASHINGTON)
: ss.
COUNTY OF _____)

I certify that I know or have satisfactory evidence that Paul Mullen, Silverado Senior Living Holdings, Inc. is the person who appeared before me, and said person acknowledged that he signed this instrument and acknowledged it to be his free and voluntary act for the uses and purposes mentioned in the instrument.

Dated this ____ day of _____, 2016.

_____

[Signature of Notary]

_____

[Print Name of Notary]

Notary Public in and for the State of
Washington, residing at _____.

My commission expires: _____.

ATTACHMENT 1

The Property

Lot B of City of Issaquah Lot Line Adjustment No. PLN 12-00027, recorded under Recording No. 20 121 213900009, in King County, Washington.

ATTACHMENT 2

Developable Area Plan

(See Attachment)

PARCEL NUMBER

SE-29-24-6, 292406-9041

LEGAL DESCRIPTION

LOT B ISSAQUAH LLA #PLN12-00027 REC #20121213900009 SD LLA BEING POR S 1/2 OF SE 1/4 OF SE 1/4 STR 29-24-6 LESS RD TGW POR NE 1/4 OF NE 1/4 LY ELY OF RD STR 32-24-6

LEGEND AND NOTES

PROPOSED NGPE (INCLUDES ALL CRITICAL AREAS AND THEIR BUFFERS)

EXISTING CRITICAL AREAS

BUILDABLE AREA

SITE AREA = 955,902 SF (21.94 ACRES)

PROPOSED DEVELOPABLE AREA = 192,307 SF (20.1%)

PROPOSED NGPE = 763,595 SF (79.9%)

WATTENBARGER Architecture
2100 112TH AVENUE NORTHEAST SUITE #100
BELLEVUE, WA 98004
T: 425-613-0666
F: 425-613-0672

Revision Schedule

#	DESCRIPTION	DATE

SITE PARCEL PLAN

Silverado - Issaquah
7932 Renton-Issaquah Rd SE
Issaquah, WA 98027

SILVERADO

JOB NO.:

PLOT DATE 10/21/2016 4:01:28 PM

DATE: 05/05/16
SCALE: 1" = 50'-0"
DRAWN: Author
CHKD: Checker

SHEET NO.: A-2.2

C:\Users\jamesb\Documents\b21415_CD_Central - Duplex_JamesB.rvt

ATTACHMENT 3

Recreational Trail Easement

(See Attachment)

December 14, 2016

AFTER RECORDING RETURN TO:

The City of Issaquah
Attn: City Clerk
P.O. Box 1307
Issaquah, WA 98027

WASHINGTON STATE COUNTY AUDITOR/RECORDER'S INDEXING FORM

Document Title(s) (or transactions contained therein):
Recreational Trail Easement

Grantor(s) (Last name first, then first name and initials)

_____

Grantee(s) (Last name first, then first name and initials)
Issaquah, City of

Legal Description (abbreviated: i.e., lot, block, plat or section, township, range)

_____

Assessor's Property Tax Parcel or Account Number: _____

Reference Number(s) of Documents assigned or released: _____

RECREATIONAL TRAIL EASEMENT

THIS RECREATIONAL TRAIL EASEMENT, is made this _____ day of _____, 20__, by and between _____ ("Grantor"), and the CITY OF ISSAQUAH, a Washington municipal corporation ("Grantee").

W I T N E S S E T H:

WHEREAS, Grantor owns a fee simple interest in the following real property, commonly known as _____, Issaquah, Washington, 98027, King County Tax Parcel No. _____ (the "Property"); and

WHEREAS, Grantor desires to grant to the Grantee an easement to be utilized for public recreational trail purposes;

NOW, THEREFORE, for valuable consideration, receipt of which is hereby acknowledged,

GRANTOR HEREBY GRANTS AND CONVEYS to the Grantee, a perpetual, nonexclusive and relocatable 20-foot wide easement, for the sole purpose of constructing, reconstructing, installing, repairing, enhancing, replacing, operating, and maintaining a multi-use recreational trail for public uses that may include, at the Grantee's sole discretion, pedestrian, bicycle, and other non-motorized use over, under, on, through and across that portion of the Property as described on **Exhibit A** attached hereto and incorporated herein (the "Easement"). The Easement is shown on the Easement Location Map attached hereto as **Exhibit B** and incorporated herein.

This Recreational Trail Easement is granted subject to the following terms and conditions:

1. Fencing. Neither Grantor nor Grantee shall erect any fencing on the easement area.

2. Open Space Uses. That portion of the Parcel outside of the Easement Area may be used for other open space uses, in accordance with the Native Growth Protection Easement (NGPE). These uses may entail planting native trees and shrubs, removing invasive plant species, and creating local trails serving the neighborhood.

3. Public Trail - Construction and Maintenance. Grantee, or their designees may, but shall not be obligated to, in its sole discretion, construct, maintain, repair, enhance and perform other activities within the Easement area for the purpose of creating and maintaining a community trail any screening or other improvements placed in the

Easement area, at such time as Grantee deems it appropriate based on the connection of the Easement area and the trails, screening or other improvements with other, similar public trails and improvements in the area.

4. Notice to Neighborhood. Grantee shall, prior to first occupancy within this plat, provide signs, number, location and content as approved by the City, noticing residents of future public trail connections.

5. Recreational Use Immunity. All persons using or coming onto the Easement area shall do so at their own risk. It is not the intent of the parties to waive or abrogate any immunity afforded to them by virtue of the Washington Recreational User statute, RCW 4.24.200 and .210, and the parties hereby expressly declare their intent to avail themselves of the immunity provisions of said statutes.

6. Relocation. This easement may be relocated within the open space tract(s) of Grantor's property described on **Exhibit C** at such time as Grantee decides to construct the trail or to have the same constructed and connected to other regional trails in the vicinity. The decision to relocate the trail easement and the final location thereof shall be at the discretion of the Grantee, provided that the easement shall be of the same 20 foot width as provided above. At such time as Grantee decides that the trail easement shall be relocated, Grantee shall notify Grantor in writing of its decision and shall provide Grantor with a legal description for the relocated easement. Grantor and Grantee shall thereafter execute and record an amendment to this trail easement in order to specify the new location. Upon recording of the amendment, the location of the trail easement will be permanently fixed and the easement may be relocated thereafter only with the consent of both Grantor and Grantee.

7. Binding Effect. This Recreational Trail Easement shall be recorded in the records of King County and shall constitute a covenant running with the Property for the benefit of the Grantee, its successors and assigns.

IN WITNESS WHEREOF, the Grantor has caused this Easement to be executed this _____ day of _____, 20__.

GRANTOR:

By: _____
Its: _____
Print Name: _____

December 14, 2016

ACCEPTED:

CITY OF ISSAQUAH

By:_____
Its: Mayor

ATTEST:

_____
City Clerk

APPROVED AS TO FORM:

_____
City Attorney

STATE OF WASHINGTON)
) ss.
COUNTY OF _____)

I certify that I know or have satisfactory evidence that _____ is the person who appeared before me, and said person acknowledged that (he/she) signed this instrument, on oath stated that (he/she) was authorized to execute the instrument and acknowledged it as the _____ of _____, to be the free and voluntary act of such party for the uses and purposes mentioned in the instrument.

DATED: _____

_____
Printed:_____
Notary Public in and for Washington,
Residing at _____
My appointment expires: _____

December 14, 2016

STATE OF WASHINGTON)
) ss.
COUNTY OF KING)

I certify that I know or have satisfactory evidence that _____ and _____ are the persons who appeared before me, and said persons acknowledged that they signed this instrument, on oath stated that they were authorized to execute the instrument and acknowledged it as the Mayor and City Clerk of THE CITY OF ISSAQUAH, to be the free and voluntary act of such party for the uses and purposes mentioned in the instrument.

DATED: _____

_____
Printed:_____
Notary Public in and for Washington,
Residing at _____
My appointment expires: _____

EXHIBIT A

LEGAL DESCRIPTION OF EASEMENT PARCEL

EXHIBIT B

MAP OF EASEMENT

DISTRIBUTION SCHEDULE
City of Issaquah

☑ **FINAL STEP**
Original Filed in
Clerk's Records Room
DATE: 12/29/16

Resolution No. 2016-20

AB 7001

Subject: Amending Issaquah Municipal Code 18.10.620 Wetland Rating System and 18.10.640 Wetland Buffer Width Requirements in order to adopt the revised wetland rating system for Western Washington adopted by the Washington State Department of Ecology; providing for severability and establishing an effective date.

12/19/2016 Date passed by City Council

☑ Signed by Mayor

☑ Signed by Council President

☑ Signed by City Clerk

Electronic copies of executed document distributed as follows:

Website Posting (iCompass): 12/20/16

Code Publishing Website: n/a

MRSC (per RCW 35A.39.010) – email notification: 12/20/16

Originating Department (Name, Dept.): Christopher Wright, DSD 12/20/16

Other: Record after Dev. Agreement signed

Hard copies of executed document distributed as follows:

Other: none

Certified Copies: 0

Total **photocopies** needed: 0

Reviewed by City Clerk CL Date 12/27/16

Tisha Gieser
Tisha Gieser, Deputy City Clerk

12/29/16
Date

CITY OF ISSAQUAH
MITIGATED DETERMINATION OF NONSIGNIFICANCE (MDNS)

Description of Proposal: The applicant is proposing to subdivide a 21.94-acre parcel into 20 single-family residential lots. Six wetlands, ranging from a Category II to IV, and three Class 2 streams with salmonids were identified on and in the vicinity of the project site. Much of the development will occur outside of critical areas buffers, but some areas will encroach into buffers. To mitigate critical area impacts, the applicant is proposing to designate additional areas as buffer and enhance existing buffers with vegetation.

Proponent:	Steve Burnstead Construction, LLC 11980 NE 24th St, Ste 200 Bellevue, WA 98005 Attn: Leo Suver
Permit Number:	PP18-00002
Location of Proposal:	7932 Renton-Issaquah RD SE, Issaquah, WA
Lead Agency:	City of Issaquah

Determination: The City of Issaquah has determined that this proposal will not have a probable significant adverse impact on the environment. An environmental impact statement (EIS) is not required under RCW 43.21C.030(2)(c). This decision was made after review of a completed environmental checklist and other information on file with the lead agency. This information is available to the public on request.

Appeal Period: This MDNS is issued under WAC 197-11-340(2) and 197-11-680(3)(a)vii. There is a 21-day appeal period for this determination, between **January 10, 2020 to January 31, 2020.** Anyone wishing to comment may submit written comments to the Responsible Official. The Responsible Official will consider the determination based on timely comments. Any person aggrieved by this determination may appeal by filing a Notice of Appeal with the City of Issaquah Permit Center. Appellants should prepare specific factual objections. Copies of the environmental determination and other project application materials are available from the Issaquah Development Services Department, 1775 12th Avenue NW.

Appeals of this SEPA determination must be consolidated with appeal of the underlying permit, per IMC 18.04.250.

Notes:

1. This threshold determination is based on review of the environmental checklist prepared on August 31, 2018 and revised on November 1, 2019; Critical Area Study & Buffer Mitigation Plan revised on July 11, 2019; Tree Report & Inventory dated July 9, 2018 and revised on November 9, 2019; Preliminary Technical Information Report (TIR) dated September 19, 2018; Preliminary Geotechnical Engineering Report dated May 12, 2017; and other documents in the file.
2. Issuance of this threshold determination does not constitute approval of the permit. The proposal will be reviewed for compliance with all applicable City of Issaquah Codes, which regulate development activities, including the Land Use Code, Critical Area Regulations, Building Codes, Clearing and Grading Ordinance, and Surface Water Design Manual.

Findings:

1. **Land Use**: The site is located within the Single Family-Estate (SF-E) zone, which allows a maximum density of 1.24 dwelling units per acre. The site is greater than five acres, and therefore, is eligible to use Cluster Housing Standards, outlined under Issaquah Municipal Code (IMC) 18.07.420.

Cluster Housing provides for concentrating the allowed residential density on the developable portion of the site in order to balance both the protection of critical areas while also accommodating housing density consistent with the Comprehensive Plan and underlying zoning. A standard subdivision would result in a more spread out, larger development footprint with more impervious surface area and site disturbance. Therefore, the environmental impacts of a cluster development are reduced compared to a standard residential subdivision.

Regional Trail: A 5-foot wide public pedestrian trail is proposed between the east and west parcel boundaries. The trail is intended to connect from State Route 900 to King County's Cedar-to-Sammamish Rivers Trail that will be located on the eastern edge. The final trail location has not yet been determined, but will be located within the critical area buffers. The applicant is required to coordinate with City staff on the final location.

Staff encourages the trail to be located in the outer 25% of the buffer, but in some areas this may not be possible due to trail access and mature trees. The applicant is proposing to provide additional buffer area equal to the trail area on the east side of Tibbetts Crossing. The proposed trail alignment is not expected to result in a loss of buffer functions. The final mitigation plans shall include the mitigation for the public trail.

The plans also show a future north to south trail segments, which will be constructed by the City at an unknown future date. Critical area buffer impacts will be determined and evaluated prior to construction of the north-south trail segment.

2. **Wetlands**: Per the Development Agreement created due to the Cluster Housing provisions, the project is vested to the land use ordinances, policies, and regulations that were in place at the time the agreement was established. Therefore, the project is vested to the critical area regulations prior to December 28, 2016.

   A Wetland Report (Wetland Resources, Inc., dated January 8, 2019 and revised July 11, 2019) was submitted with the application, including; wetland delineation and wetland rating, stream classification, and summary of project impacts and mitigation. The wetland delineation and rating were evaluated by an outside ecologist peer review (Watershed, June 6, 2019 and August 6, 2019), which confirmed the accuracy of the wetland boundaries and wetland rating.

   The project site has six wetlands located on or within close vicinity of the site. There is one Category IV wetland with a 40-foot buffer on-site, three Category III wetlands on-site, and one Category III wetland located off-site with a buffer located on the project site. All Category III wetlands have a 50-foot buffer. There is one Category II wetland with a 75-foot buffer on-site.

   The proposed development is avoiding direct impacts to all of the wetlands located on the project site, but will encroach into a few associated buffers. To mitigate impacts, the applicant is proposing to utilize buffer averaging, designate additional buffer areas within the site, and enhance existing buffers. The proposed enhancements will increase the structural diversity of vegetation and improve habitat functions over current conditions.

3. **Stream**: The site contains three streams with salmonids; Tibbetts Creek and two unnamed tributaries to Tibbetts Creek. Per IMC, Class 2 streams are required to have a 100-foot buffer. Five of the proposed lots (Lots: 8, 9, 10, 11, and 16) will encroach into the stream buffer. To mitigate stream buffer impacts, buffer area lost will be replaced through buffer averaging.

   The reduced stream buffers shall be planted at a planting density consistent with IMC 18.10.790.D; a minimum planting density of 10-feet on-center for trees and 5-feet on-center for shrubs. The planting density shall be shown on the final stream buffer enhancement planting plan.

Final stream buffer enhancement plans are required for approval by the Issaquah Development Services Department (DSD) prior to issuing construction permits. Final plans shall include a grading plan, planting plan and a 5-year monitoring/maintenance plan with performance standards for monitoring success of the enhancement planting. The plans shall meet King County Critical Areas Mitigation Guidelines for monitoring performance standards.

In accordance with the Cluster Housing provision, all critical areas present on the project site will be preserved as a critical area/open space tract, protecting vegetation and precluding development in perpetuity. This shall be noted on the Final Plat.

4. **Bridge Crossing/Floodplain**: Tibbetts Creek bisects the site from north to south. The applicant is proposing single-family lots on both sides of the stream and intends to construct a bridge crossing over the creek. The road section will consist of two 10-foot travel lanes, a 5-foot wide sidewalk on one side, and two concrete traffic barriers located on both sides of the road. The proposed access road, bridge span over Tibbetts Creek, and new outfall to Tibbetts Creek are currently shown within the Special Flood Hazard Area (SFHA). The bridge design will be reviewed in detail during the construction permit phase, but the supporting foundation of the bridge should be designed outside of the ordinary high water mark. Any required mitigation will be determined under the Flood Hazard permit review process.

5. **Cultural Resources**: All existing structures on-site are intended to be removed. It is presumed the structures on-site are 50 years of age or older, and therefore, there is the potential the site may contain archaeological resources and a number of historical period buildings. Prior to demolition of existing structures, a Cultural Resources Assessment must be conducted. The purpose of the assessment is to determine the presence of surface and subsurface archaeological resources, as well as, historic buildings and structures that are eligible for listing on the National Register of Historic Places (NRHP).

6. **Vegetation**: The majority of the site is undeveloped and consists of tree stands and pasture. City Code requires the site to retain a minimum of 30% of the total caliper of existing significant trees outside of critical areas and buffers. The proposal will remove approximately 1,552.2 diameter inches of existing trees, which leaves approximately 71.4% of trees to be retained.

7. **Stormwater**: The project is required to comply with the 2009 King County Surface Water Design Manual (KCSWDM) along with the City of Issaquah 2011 Addendum (per existing Development Agreement), which together identify the requirements for the storm water detention, treatment and conveyance systems. The project will be adding more than 5,000 square feet of new impervious area. Therefore, the project is required to apply Conservation Flow Control (Level 2) and Sensitive Lake Water Quality. To avoid pollutants from entering the stream, enhanced treatment for all stormwater runoff Compliance with storm flow control and treatment requirements is achieved through a combination of detention/treatment vaults, bioretention, infiltration, and dispersion techniques.

8. **Traffic**: The project is anticipated to generate approximately 179 average daily trips with 14 trips during the AM peak hour and 19 trips during the PM peak hour. With the City's traffic concurrency system, development projects mitigate their impacts on the City street system with payment of traffic impact fees. The City utilizes traffic impact fees to construct identified road improvements to maintain adopted level of service (LOS) standards on a City-wide basis.

9. **Public Services**: The proposal will have a potential impact on public services, including police and general government buildings. IMC Chapter 3.74, Methods to Mitigate Development Impacts, provides alternatives to mitigate for direct impacts of proposed development. The City may approve a voluntary payment in lieu of other mitigation. Rate studies for police facilities, general government buildings, and bicycle and pedestrian facilities are included in IMC 18.10.260 as the City's SEPA policy base. The rate studies present the methodology and formulas for determining the amount of the mitigation fee commensurate with the proposed land use and project impacts. The mitigation fees will be assessed with issuance of building permits and the actual cost of the mitigation fees will be the adopted fees in effect at the time of permit issuance.

Mitigation Measures: The Mitigated Determination of Nonsignificance is based on the checklist prepared on August 31, 2018 and revised on November 1, 2019, and supplemental information in the application. The following SEPA mitigation measures shall be deemed conditions of the approval of the licensing decision pursuant to Chapter 18.10 of the Issaquah Land Use Code. All conditions are based on policies adopted by reference in the Land Use Code.

1. Impacts to critical area buffer that are caused by road bridge and pedestrian trails must be mitigated in accordance with the King County Mitigation Guidelines.
2. Final critical area and associated buffer enhancement plans are required for approval by the City's Development Services Department prior to issuing construction permits. Final plans shall include, but are not limited to, a planting plan and a 5-year monitoring/maintenance plan with performance standards for monitoring success of the enhancement planting. The plans shall meet standards of the King County Critical Areas Mitigation Guidelines for the planting density and monitoring performance standards.
3. Approved tree protection measure must be in place prior to any construction or demolition activities and installed in conjunction with limits of clearing and grading delineation. Clearing and grading shall be outside the critical root zone of significant trees.
4. After rough clearing and grading, trees retained along the edge of clearing limits shall be evaluated for hazardous trees. If removal of hazardous trees is necessary, the applicant shall plan replacement trees consistent with the City's Landscape Code for replacement trees, IMC 18.12.
5. Enhanced treatment shall be required for all stormwater runoff from pollution generating impervious surfaces.
6. Soil disturbing activities within the 100-year floodplain must occur during summer low-flow months only (July/August/September), to avoid incidental impacts to stream habitat or fish.
7. A Cultural Resources Assessment must be conducted prior to demolition of existing structures. The assessment must be submitted with the Site Work Permit.
8. The applicant shall mitigate for potential impacts on public services and bicycle and pedestrian facilities. The City may approve a voluntary payment in lieu of other mitigation. Mitigation fees will be assessed with issuance of building permits and the actual fee amount will be the adopted fee in effect at the time of permit issuance. Applicant objections to the voluntary payment should be made during the SEPA appeal period.

Responsible SEPA Official: Keith Niven

Position/Title: Development Services Director

Address/Phone: P.O. Box 1307, Issaquah, WA 98027-1307 (425) 837-3094

Date: 1/10/2020 **Signature:** Valerie Porter for Keith Kiven

cc: Washington State Department of Ecology
Muckleshoot Indian Tribe
Snoqualmie Indian Tribe
U.S. Army Corps of Engineers
Washington State Department of Fish and Wildlife
Washington State Department of Archeology and Historic Preservation (DAHP)
Sammamish Plateau Water & Sewer District
King County Dept of Local Services - Road Services Division

UPDATED
SEPA ENVIRONMENTAL CHECKLIST

Purpose of checklist:

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

Instructions for applicants:

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Instructions for Lead Agencies:

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

Use of checklist for nonproject proposals:

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements –that do not contribute meaningfully to the analysis of the proposal.

A. Background [HELP]

1. Name of proposed project, if applicable:

   TIBBETTS CROSSING

2. Name of applicant:

Steve Burnstead Construction LLC, Leo Suver

3. Address and phone number of applicant and contact person:

11980 NE 24th Street, Suite 200, Bellevue, WA 98005

4. Date checklist prepared:

8/31/2018, revised 11/1/2019 (City revisions in red)

5. Agency requesting checklist:

City of Issaquah

6. Proposed timing or schedule (including phasing, if applicable):

Start Construction in Late Spring 2020

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

None at this time.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

Preliminary TIR, Arborist Report, Critical Area Report, Geotechnical Report

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

None to our knowledge

10. List any government approvals or permits that will be needed for your proposal, if known.

Preliminary Plat Approval, SEPA Determination, Forest Practices Permit (if required), Drainage Plan Approval, Water and Sewer Construction Plan Approval, Grading Permit, Final Plat Approval, Residential Building Permit, A Construction Storm Water General Permit, Issaquah Flood Hazard Permit .

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

Subdivide a 21.94-acre parcel into 20 single-family residential lots. Site improvements are required, which include an internal roadway, a bridge crossing over Tibbetts Creek, pedestrian trail, stormwater, utility, and frontage improvements along SR-900.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

The project is located at 7932 RENTON-ISSAQUAH RD SE 98027. It is tax parcel 292406-9041. Legal: Lot B of Issaquah LLA PLN 12-00027 Recorded in king county records under recording no. 2012121390009

B. Environmental Elements [HELP]

1. *Earth* [help]

a. General description of the site:

(circle one): Flat, rolling, hilly, steep slopes, mountainous, other _____

b. What is the steepest slope on the site (approximate percent slope)?

25% in developed area and over 40% outside of developed area

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils.

See Geotech report, Silt fine sand and silt with gravelly fine to coarse sand layers. (Quaternary Alluvium and Vashon recessional outwash, Vashon Ice-Contact)

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

None to our knowledge

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill.

The affected area is approximately 2.98 acres. The project will have 2,000 CY of cut and 24,000 CY of fill. Location of fill material has not been determined but it will be from an approved location.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

Yes erosion could occur, however the use of BMP's will mitigate possible erosive situations should they occur and limiting earthwork to seasonally drier periods, typically April 1 to October 31.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

Approximately 36% of the site will be covered with impervious surfaces

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

A Construction Storm Water General Permit (CSWGP) from WA State Dept. of Ecology is required, which involves a Storm Water Pollution Prevention Plan detailing all erosion control and pollution control to be implemented during construction. A temporary erosion and sedimentation control (TESC) plan will be prepared and implemented prior to commencement of construction activities. During construction, erosion control measures may include any of the following: siltation fence, siltation ponds and other measures which may be used in accordance with the requirements of the City. The native topsoil and duff will be sustained to the maximum extent feasible.

2. Air [help]

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known.

A temporary erosion and sedimentation control (TESC) plan will be prepared and implemented prior to commencement of construction activities. During construction, erosion control measures may include any of the following: siltation fence, siltation ponds and other measures which may be used in accordance with the requirements of the City. The native topsoil and duff will be sustained to the maximum extent feasible.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

Off-site sources of emissions are those typical of the residential neighborhoods that surround this site, such as automobile emissions from traffic on adjacent roadways and fireplace emissions from nearby houses.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

Construction impacts will not be significant and can be controlled by several methods: watering or using dust suppressants on areas of exposed soils, washing truck wheels before leaving the site, and maintaining gravel construction entrances.

Automobile and fireplace emission standards are regulated by the State of Washington. The site has been included in a "No Burn Zone" by the Puget Sound Air Pollution Control Agency which went into effect on September 1, 1992. No land clearing or residential yard debris fires would be permitted on-site, nor in the surrounding neighborhood in accordance with the regulation.

3. Water [help]

a. Surface Water: [help]

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

Yes. Tibbetts Creek and the West Fork of Tibbetts Creek are both Class 2 streams with known salmonid use (including Chinook Salmon). There is also an unnamed tributary to Tibbetts Creek on the project site (SE). Eventually these streams flow into Lake Sammamish. There are 3 wetlands on-site. Wetland A is a Category IV, Wetland B and C are Category III. See Critical Area Study by Wetland Resources for more detail.

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

Yes. Wetlands and Tibbetts Creek will be crossed with a single-lane pedestrian and vehicular bridge (to be constructed with fish passage) and development will be adjacent to and in the buffers.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

None. All activity is planned to be in buffers only. Please see Engineering plans to show impacts. Fill will come from an approved site with the City.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

None.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

Yes.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

No, the project will be connected to the public sanitary sewer system.

b. Ground Water: [help]

1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known.

No

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

Not applicable. The site will be served by sanitary sewer.

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

Runoff will be generated by impervious surfaces such as driveways, roads, sidewalks, roofs and patios. The roofs from all of the lots (except 2-7) will be collected and conveyed to dispersion trenches or infiltration trenches. A portion of the road will utilize sheet flow dispersion and the remaining area will discharge to two detention vaults.

2) Could waste materials enter ground or surface waters? If so, generally describe.

This would be very unlikely. The only materials that could enter ground or surface waters would be those associated with automobile discharges and yard and garden preparations. Pollutants generated during construction include suspended solids and trace petroleum hydrocarbons. Following construction, the two primary sources of pollutants include roadways and landscaping chemicals. Roadway runoff includes trace petroleum hydrocarbons and trace metals. Landscaping chemicals include fertilizers, pesticides and herbicides.

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.

Yes, Drainage patterns are altered. Project proposes a large subdivision with >1acre hard surface. Runoff will be captured and conveyed to Tibbetts Creek.

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any:

Stormwater BMPs and detention vaults will be used to control and reduce surface runoff.

4. Plants [help]

a. Check the types of vegetation found on the site:

__X__deciduous tree: alder, maple, aspen, other
__X__evergreen tree: fir, cedar, pine, other
____shrubs
__X__grass
__X__pasture
____crop or grain
____ Orchards, vineyards or other permanent crops.
__X__ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
__X__water plants: water lily, eelgrass, milfoil, other
____other types of vegetation

b. What kind and amount of vegetation will be removed or altered?

Selected trees will be retained per Municipal Code as well as areas where no development is shown. The remainder of the site will be cleared for the construction of homes and access/utilities, unless otherwise noted on the plans.

c. List threatened and endangered species known to be on or near the site.

No threatened or endangered species known to be on or near the site..

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

Proposed landscaping may include the use of native or drought resistant plants. Invasive species found on site will be removed to enhance existing vegetation, where retained.

e. List all noxious weeds and invasive species known to be on or near the site.

There are known noxious / invasive species known to be on or near site. These are what was found; reed canary grass (Phallaris arundinacea), creeping buttercup (Ranunculus repens), Himalayan blackberry (Rubus armeniacus), giant horsetail (Equisetum telmateia). There may be others, but none that were observed.

5. Animals [help]

a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site.

Examples include:

birds: hawk, heron, eagle, songbirds, other:
mammals: deer, bear, elk, beaver, other:

fish: bass, salmon, trout, herring, shellfish, other Salmonids

b. List any threatened and endangered species known to be on or near the site.

Puget Sound Chinook

c. Is the site part of a migration route? If so, explain.

Yes. The Pacific Flyway. Also, Tibbetts Creek is spawning habitat and part of the migration route of salmonids, including Chinook Salmon.

d. Proposed measures to preserve or enhance wildlife, if any:

The buffer mitigation on-site will enhance the buffers around the wetlands and Tibbets Creek which will help to preserve wildlife. The project will also comply with the cities tree retention requirements or exceed them.

e. List any invasive animal species known to be on or near the site.

There are no known invasive animal species to be on or near the site.

6. Energy and Natural Resources [help]

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

Electricity and/or natural gas will be the primary source of energy used to provide heating and cooling to each home. These forms of energy are immediately available to the site. The builder will provide the appropriate heating and cooling systems which are energy efficient and cost effective for the homebuyer.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

No.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:

The requirements of the Building Code and the State Energy Code will be incorporated into the construction of the buildings. Energy conserving materials and fixtures will be evaluated for suitability in all new construction.

7. Environmental Health [help]

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.

None to our knowledge. The potential for any of these to occur is the same as all other single family residential neighborhoods. There was a demolition permit at which time the water and sewer lines were capped so no septic field was being used at this point. If it is still on the property it will be removed per approved methods. The house was switched to natural gas in the past, if an oil tank is found, the appropriate approved method of removal will be used.

1) Describe any known or possible contamination at the site from present or past uses.

There are no known contaminates on the site from past or present.

2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.

There are none to our knowledge.

3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.

Any chemical stored on site would be typical of residential home construction.

4) Describe special emergency services that might be required.

There are none to our knowledge.

5) Proposed measures to reduce or control environmental health hazards, if any:

There are no on-site environmental health hazards known to exist today, nor are there any that will be generated as a direct result of this project.

b. Noise

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

The main source of off-site noise in this area originates from the vehicular traffic along SR 900.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

Short-term noise impacts will result from the use of construction and building equipment during site development and home construction. These temporary activities will be limited to legal working hours as prescribed by City Code. Long-term impacts will be those associated with the increase of human population, additional traffic and noise associated with residential areas will occur in the area.

3) Proposed measures to reduce or control noise impacts, if any:

Building construction will be done during the hours prescribed by the City of Issaquah. Construction equipment will be equipped with muffler devices and idling time will be encouraged to be kept to a minimum.

8. Land and Shoreline Use [help]

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.

North: Single Family/Commercial ***East: Single Family***
South: Single Family ***West: Single Family***

Current proposal does not affect current land uses.

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use?

No.

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how:

No.

c. Describe any structures on the site.

There are 5 buildings on the site. One is Single Family and the rest are out buildings.

d. Will any structures be demolished? If so, what?

Yes. All of them.

e. What is the current zoning classification of the site?

SF-E

f. What is the current comprehensive plan designation of the site?

Low Density Residential

g. If applicable, what is the current shoreline master program designation of the site?

Not applicable.

h. Has any part of the site been classified as a critical area by the city or county? If so, specify.

There are two Category III and one Category IV wetland on site. There are also two Class 2 streams on site. Please reference the Critical Areas report submitted as part of this application for more detailed information.

i. Approximately how many people would reside or work in the completed project?

Approximately 50 people will reside in the project (20 units X 2.5 persons per unit).

j. Approximately how many people would the completed project displace?

None. The site is currently vacant.

k. Proposed measures to avoid or reduce displacement impacts, if any:

None. The site is currently vacant.

L. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

The future homes, not part of this permit, will be of similar size and style as the surrounding homes and will largely comply with zoning standards.

m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any:

None. There will be no anticipated impact on these items.

9. Housing [help]

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

Twenty units will be provided. They will likely be in the middle to high income range.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

None. The site is currently vacant.

c. Proposed measures to reduce or control housing impacts, if any:

None. The site is currently vacant and the project will add housing opportunities.

10. Aesthetics [help]

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

Building height will comply with zoning standards at the time of vesting.

b. What views in the immediate vicinity would be altered or obstructed?

There are no iconic views that are anticipated to be altered or obstructed.

b. Proposed measures to reduce or control aesthetic impacts, if any:

There are no proposed measures because there is projected to be no impacts.

11. Light and Glare [help]

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

Minimal light and glare will be a result of residential lighting and traffic which will occur late in the evening or early in the morning.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

Not to our knowledge. Homes will likely be constructed out of typical building materials such as wood, masonry brick, and asphalt shingles. These materials typically do not produce glare.

c. What existing off-site sources of light or glare may affect your proposal?

No significant impacts from offsite light or glare as a result of the surrounding residential neighborhoods are anticipated.

d. Proposed measures to reduce or control light and glare impacts, if any:

The project will be carefully designed to minimize light and glare including the utilization of down-lighting. The lighting will comply with the City's lighting Design Standards.

12. Recreation [help]

a. What designated and informal recreational opportunities are in the immediate vicinity?

Cougar Mountain park is within 2 miles to the west and Tibbetts Valley Park is approximately ½ mile north along SR-900.

b. Would the proposed project displace any existing recreational uses? If so, describe.

No.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

There will be a portion of a regional trail placed in the eastern edge of the stream buffer south of the crossing road that extends to our southern boundary. It will be a 5' soft surface trail. Eventually it will be connected to the adjacent properties.

13. Historic and cultural preservation [help]

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers ? If so, specifically describe.

No.

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.

None to our knowledge.

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.

If an archaeological site is found during the course of construction, the State Historical Preservation Officer will be notified.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.

If an archaeological site is found during the course of construction, the State Historical Preservation Officer will be notified.

14. Transportation [help]

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any.

The site will provide vehicular access from SR-900, Renton-Issaquah Rd.

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop?

The site is not served by public transit at the site. Service is provided approximately .5 miles to the north at the Issaquah Transit Station.

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate?

80-Four parking spaces will be provided in association with each home (garage and driveway); Six On-street parking spaces will also be provided on one side.

d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).

Yes, there will be required improvements on SR-900.

e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

No.

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates?

The trip generation estimates for the proposed residential development (20 single-family lots) were based on methodology documented in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th edition for land use code (LUC) 210 (Single-Family Detached Housing). The proposed development is estimated to generate 179 net new weekday daily trips with 14 net new trips occurring during the weekday AM peak hour (4 in, 10 out) and 19 net new trips during the weekday PM peak hour (12 in, 7 out).

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.

No.

h. Proposed measures to reduce or control transportation impacts, if any:

The project will enter and exit at a signaled intersection which will require improvements at the signal.

15. Public Services [help]

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe.

Yes, the need for public service such as fire, health, and police protection will be typical of single family development of this size. The school children originating from the homes in this development will attend the schools in the District.

b. Proposed measures to reduce or control direct impacts on public services, if any.

The roads and homes will be constructed to meet all applicable standards and codes of the City and Building Code. The proposed development will contribute to the local tax base and provide additional tax revenue for the various public services.

16. Utilities [help]

a. Circle utilities currently available at the site:
electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other _____

c. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

Electricity will be provided by Puget Sound Energy.
Natural Gas will be provided by Puget Sound Energy.
Water Service will be provided by City of Issaquah.
Sanitary Sewer will be provided by City of Issaquah.
Storm will be maintained by City of Issaquah
Garbage is currently Recology CleanScapes
Cable, internet, telephone can be provided by Xfinity
Cable, can be provided by Wave Broadband
Telephone Service will be provided by Frontier Communications.

C. Signature [HELP]

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: _____

Name of signee Leo Suver

Position and Agency/Organization Steve Burnstead Construction LLC

Date Submitted: 9/24/18 updated 12/13/19

D. Supplemental sheet for nonproject actions [HELP]

associated
earth sciences
incorporated

Subsurface Exploration, Geologic Hazard, and Preliminary Geotechnical Engineering Report

BURNSTEAD MULTI-FAMILY

Issaquah, Washington

Prepared For:

STEVE BURNSTEAD CONSTRUCTION, LLC

May 12, 2017
Project No. 170037E001

Associated Earth Sciences, Inc.
911 5th Avenue
Kirkland, WA 98033
P (425) 827 7701
F (425) 827 5424

associated
earth sciences
incorporated

May 12, 2017
Project No. 170037E001

Steve Burnstead Construction, LLC
11908 NE 24th Street
Bellevue, Washington 98005

Attention: Mr. Leo Suver

Subject: Geotechnical Exploration, Geologic Hazard, and Preliminary Geotechnical Engineering Report
Burnstead Multi-Family
SR 900 and Talus Drive
Issaquah, Washington

Dear Mr. Suver:

We are pleased to present this copy of our preliminary geotechnical engineering report for the referenced project. This report summarizes the results of our subsurface exploration, geologic hazards, and geotechnical engineering studies, and offers preliminary recommendations for the design and development of the proposed project. This report is based on a site concept sketch and a site parcel plan you provided, and our knowledge of the site gained through completion of both a preliminary geotechnical engineering study of the site for another client in 2015 and our additional explorations completed for this study. The recommendations presented in this report are based on subsurface explorations completed onsite by Associated Earth Sciences, Inc. in 2015 and recently in 2017. We recommend that we be allowed to review project plans when they are developed and update our recommendations as needed.

We have enjoyed working with you on this study and are confident that the recommendations presented in this report will aid in the successful completion of your project. If you should have any questions or if we can be of additional help to you, please do not hesitate to call.

Sincerely,
ASSOCIATED EARTH SCIENCES, INC.
Kirkland, Washington

Matthew A. Miller, P.E.
Principal Engineer

MM/ld - 170037E001-3 - Projects\20170037\KE\WP

SUBSURFACE EXPLORATION, GEOLOGIC HAZARD, AND PRELIMINARY GEOTECHNICAL ENGINEERING REPORT

BURNSTEAD MULTI-FAMILY

Issaquah, Washington

Prepared for:
Steve Burnstead Construction, LLC
11908 NE 24th Street
Bellevue, Washington 98005

Prepared by:
Associated Earth Sciences, Inc.
911 5th Avenue
Kirkland, Washington 98033
425-827-7701
Fax: 425-827-5424

May 12, 2017
Project No. 170037E001

I. PROJECT AND SITE CONDITIONS

1.0 INTRODUCTION

This report presents the results of our subsurface exploration, geologic hazards, and preliminary geotechnical engineering studies for the proposed project. The site location is shown on the "Vicinity Map," Figure 1. The approximate locations of explorations completed for this study and for our 2015 study are shown on Figure 2, "Site and Exploration Plan." Interpretive logs and associated laboratory test results completed for this study and our 2015 study are included in the Appendix. The conclusions and recommendations contained in this report should be reviewed and modified, or verified, to reflect final plans when they are developed.

1.1 Purpose and Scope

The purpose of this study is to provide geotechnical engineering design recommendations to be utilized in the preliminary design of the project. This study included a review of selected available geologic literature, observing the excavation of 12 exploration pits, advancing 2 exploration borings, and performing geologic studies to assess the type, thickness, distribution, and physical properties of the subsurface sediments and shallow ground water. Geotechnical engineering studies were completed to formulate recommendations for site preparation, structural fill, foundations, foundation walls, floor slabs, drainage, infiltration feasibility, and detention vault considerations. This report summarizes our fieldwork and offers preliminary geotechnical engineering recommendations based on our present understanding of the project. We recommend that we be allowed to review the project plans once they have been finalized to verify that they conform with the recommendations presented below. If any changes in the nature or design of the project occurs, the conclusions and recommendations presented in this report should be reviewed and verified, or modified, as appropriate.

1.2 Authorization

This report has been prepared for the exclusive use of Steve Burnstead Construction, LLC and its agents for specific application to this project. Our work was performed in accordance with our scope of work and cost proposal dated January 24, 2017 and our change of scope and budget request dated April 4, 2017. We were authorized to proceed by means of a signed proposal. Within the limitations of scope, schedule, and budget, our services have been performed in accordance with generally accepted geotechnical engineering and engineering geology practices in effect in this area at the time our report was prepared. No other warranty, express or implied, is made.

2.0 PROJECT AND SITE DESCRIPTION

The subject site is located on the east side of 7932 Renton-Issaquah Road SE, at the intersection of NW Talus Drive (King County Parcel No. 292406-9041). The parcel is about 22 acres in area and currently occupied by one existing residence. The parcel is bisected north to south by Tibbets Creek. East of Tibbets Creek, the parcel is undeveloped and densely vegetated by various understory plants and large trees. West of Tibbets Creek, the majority of the parcel consists of pasture with scattered stands of trees and a single-family residence at the south end with various associated barns and other outbuildings. The topography on the eastern half of the site slopes down to the west towards the creek with slopes inclined approximately up to 25 percent; the topography west of the creek slopes gently down to the northeast at an average inclination between 5 and 10 percent. Several wetlands are delineated on the western half of the property, particularly adjacent to the creek and at the northwestern corner of the parcel.

The current site concept drawing calls for construction of 20 new single-family residential lots, new paved access roads, and a storm water detention vault identified on the north part of the site. We understand that four additional new single-family residential lots are proposed on the east side of Tibbets Creek. A single lane pedestrian and vehicular bridge is also proposed to provide access to the four additional residential lots. No site grading or retaining walls are depicted on the concept drawing. We understand that storm water infiltration is desired on this site if feasible. This report contains a feasibility-level infiltration discussion.

Based on the granular alluvium and recessional outwash sediments and relatively shallow ground water encountered in our explorations completed for this study and our previous study for another client in 2015, a limited liquefaction analysis was completed and liquefaction risk mitigation measures are recommended, as described in this report.

3.0 SUBSURFACE EXPLORATION

Our subsurface exploration completed for this project included excavation of 12 exploration pits and advancing 2 exploration borings. One of the exploration borings was completed as a ground water observation well. The locations of the explorations were measured in the field from known landmarks, and the locations depicted on Figure 2 are taken from concept design plans provided to us by Steve Burnstead Construction, LLC. Interpretive exploration logs and laboratory test results are presented in the Appendix.

The various types of sediments, as well as the depths where characteristics of the sediments changed, are indicated on the exploration logs presented in the Appendix. The depths indicated on the logs where conditions changed may represent gradational variations between sediment types in the field.

The conclusions and recommendations presented in this report are based on the explorations completed for this study and our previous study for another client in 2015. The number, locations, and depths of our explorations were completed within site and budget constraints. Because of the nature of exploratory work below ground, extrapolation of subsurface conditions between field explorations is necessary. It should be noted that differing subsurface conditions may sometimes be present due to the random nature of deposition and the alteration of topography by past grading and/or filling. The nature and extent of any variations between the field explorations may not become fully evident until construction. If variations are observed at that time, it may be necessary to re-evaluate specific recommendations in this report and make appropriate changes.

3.1 Exploration Pits

The exploration pits were excavated using a track-mounted excavator. The pits permitted direct, visual observation of subsurface conditions. Materials encountered in the exploration pits were studied and classified in the field by an engineering geologist from our firm. All exploration pits were backfilled immediately after examination and logging. Selected samples were then transported to our laboratory for further visual classification and testing, as necessary.

3.2 Exploration Borings

The exploration borings for this study were completed by advancing 8-inch, outside-diameter, hollow-stem auger tooling with a rubber track-mounted drill rig. During the drilling process, samples were obtained at generally 2.5- to 5-foot-depth intervals. The exploration borings were continuously observed and logged by an engineering geologist from our firm. The exploration logs presented in the Appendix are based on the field logs, drilling action, and inspection of the samples secured.

Disturbed, but representative samples were obtained by using the Standard Penetration Test (SPT) procedure in accordance with *American Society for Testing and Materials* (ASTM) D-1586. This test and sampling method consists of driving a standard 2-inch, outside-diameter, split-barrel sampler a distance of 18 inches into the soil with a 140-pound hammer free-falling a distance of 30 inches. The number of blows for each 6-inch interval is recorded, and the number of blows required to drive the sampler the final 12 inches is known as the Standard Penetration Resistance ("N") or blow count. If a total of 50 is recorded within one 6-inch interval, the blow count is recorded as the number of blows for the corresponding number of inches of penetration. The resistance, or N-value, provides a measure of the relative density of granular soils or the relative consistency of cohesive soils; these values are plotted on the attached exploration boring logs.

The samples obtained from the split-barrel sampler were classified in the field and representative portions placed in watertight containers. The samples were then transported to our laboratory for further visual classification and laboratory testing, as necessary.

3.3 Monitoring Well

Following drilling, a ground water monitoring well was installed in exploration boring EB-1W to allow for documentation and long-term monitoring of ground water levels below the site. This well consists of a 2-inch-diameter, polyvinyl chloride (PVC) Schedule-40 well casing with threaded connections. The lower 10 feet of the well is a finely slotted (0.020-inch machine slot) well screen to permit water inflow. The annular space around the well screen was backfilled with silica sand, and the upper portion of annulus was sealed with bentonite grout and chips. A steel flush-mount monument was placed over the top of the wellhead for protection. The as-built configuration of this well is illustrated on the associated boring log included in the Appendix.

4.0 SUBSURFACE CONDITIONS

Subsurface conditions at the project site were inferred from the field explorations accomplished for this study and our 2015 study, visual reconnaissance of the site, and review of selected geologic literature. The general distribution of geologic units is shown on the field logs. The explorations to the west of Tibbets Creek generally encountered very loose to dense Quaternary alluvium underlain by loose to medium dense Vashon recessional outwash sediments. The explorations to the east of Tibbets Creek generally encountered medium dense to dense recessional outwash sediments underlain by medium dense to dense ice-contact deposits.

We reviewed a published geologic map of the project, *Geologic Map of the Issaquah 7.5' Quadrangle, King County, Washington*, by Derek B. Booth and James P. Minard, 1992. The referenced map indicates that the site is expected to be underlain at shallow depths by Vashon recessional outwash with Vashon ice-contact sediments mapped nearby. Our on-site explorations and interpretations are generally consistent with the conditions depicted on the published map.

4.1 Stratigraphy

Grass/Topsoil

A surficial layer of grass and organic topsoil was encountered at each of the exploration locations. This organic layer ranged from approximately 6 to 8 inches in thickness. Observed topsoil thickness is shown on the attached subsurface exploration logs. Due to their high

organic content, these materials are not considered suitable for foundation, roadway, or slab-on-grade floor support, or for reuse in a structural fill.

Quaternary Alluvium

Six exploration pits and both exploration borings encountered sediments interpreted as alluvium deposits. The thickness of the alluvium ranged from 6 to 31.5 feet. The alluvium consisted primarily of stratified, loose to medium dense, silty fine sand and silt with occasional gravelly fine to coarse sand layers. The alluvium generally contained trace amounts of organics. Alluvium consists of unconsolidated sediments deposited by flowing water. Alluvial sediments are also susceptible to liquefaction during a seismic event. The alluvium is typically very loose to loose and is susceptible to consolidation under anything more than light foundation loads. These static and seismic settlement risks warrant raising the grade of the site with structural fill in order to mitigate the liquefaction risks. Excavated alluvial sediments are expected to be above optimum moisture content for compaction purposes. If reuse of alluvial sediments in compacted fills is explicitly allowed by project plans and specifications, they will need to be dried during favorable dry site and weather conditions to allow their reuse in structural fill applications.

Vashon Recessional Outwash Deposits

Sediments interpreted to be representative of Vashon recessional outwash were encountered directly below the alluvium in most of our explorations and at the surface at the locations of EP-3, EP-6, EP-9, EP-11, and EP-12. Where encountered, the recessional outwash extended for the full depth explored, except in EP-6 where it was underlain by ice-contact deposits. The recessional outwash was deposited by meltwater streams that emanated from the retreating glacial ice during the latter portion of the Vashon Stade of the Fraser Glaciation approximately 13,000 years ago, and has not been glacially overridden.

In general, these sediments consisted of stratified, gravelly, fine to coarse sand with a highly variable silt content interbedded with occasional layers of silty fine sand. These sediments were generally in a loose to medium dense condition; moderate caving was observed in the explorations pits especially when the soils were saturated.

Recessional outwash sediments are also susceptible to liquefaction during a seismic event. The alluvium is typically very loose to loose and is susceptible to consolidation under anything more than light foundation loads. These static and seismic settlement risks warrant raising the grade of the site with structural fill in order to mitigate the liquefaction risks. Excavated recessional outwash material may be suitable for reuse in structural fill applications if it is at a moisture content that allows compaction to the specified level for the intended use. At the time of exploration, we estimate that the majority of the recessional outwash that we observed was near optimum moisture content (near the surface) or above optimum moisture content (below

ground water level) for compaction purposes, and therefore may require drying during favorable weather prior to compaction in structural fill applications.

Vashon Ice-Contact

Below the recessional outwash at a depth of about 12 feet, exploration pit EP-6 encountered loose to medium dense, very silty sand with some gravel interpreted as ice-contact sediments. Ice-contact sediments were also encountered at the surface in EP-10. Ice-contact deposits consist of a wide variety of sediment types initially deposited above or within a glacial ice mass and later re-deposited when the ice melts. Ice-contact sediments can be normally consolidated or glacially overridden and are usually stratified. Ice-contact deposits at this site primarily consist of silt and are considered moisture-sensitive.

4.2 Hydrology

Ground water seepage was encountered in six of our exploration pits on the west part of the site and ground water was encountered in both exploration borings at a depth of approximately 1 foot below ground surface.

Ground water was encountered in all eight of our exploration pits on the west part of the property at the time of our field study in March of 2015 and in both exploration borings completed in February of 2017. The observed ground water is interpreted to be representative of the regional unconfined aquifer developed within the alluvium and recessional outwash. Ground water was generally encountered at depths of about 1 to 8 feet below the ground surface. Our explorations were completed near the end of the wet season (February and March) when ground water levels are typically approaching their seasonal high. Higher ground water levels may occur following large storm or river flood events, and lower ground water levels can be expected in the late summer and fall seasons. It should be noted that fluctuations in the level of the ground water can occur due to on- and off-site land use, variations in rainfall, and the water level of the nearby Tibbetts Creek.

4.3 Laboratory Test Results

Four laboratory grain-size analyses were performed in accordance with ASTM D-422 on representative selected samples of the Vashon recessional outwash. The tests were completed as part of our limited liquefaction analysis, as described in Section 6.3 of this report, and as part of our infiltration feasibility study. The grain-size analyses test results are included in the Appendix.

4.4 Infiltration Feasibility

We anticipate that Low Impact Development (LID) systems, such as permeable pavement and rain gardens, may be under consideration for the management of storm water runoff on this site. As discussed above, the site is underlain by alluvium (silty fine sand and silt) and recessional outwash (typically gravelly fine to coarse sand with a variable silt content). Due to the high content of fine-grained sediments of the alluvium, the highly variable silt content of the recessional outwash, and the generally shallow ground water, the potential for infiltration onsite would be considered low, in our opinion. There is a limited potential for infiltration on the western side of the site, where unsaturated recessional outwash was encountered near the surface, in EP-3 and EP-6 and on the east side of Tibbets Creek in EP-9, EP-11, and EP-12. However, due to the variable nature of its grain-size characteristics, the presence of occasional silt or silty fine sand layers, and the presence of shallow ground water, infiltration rates are anticipated to be very low. Grain-size analyses were completed in our laboratory on selected samples of the recessional outwash in EP-3 and the alluvium in EP-1. Results are included in the Appendix.

Further assessment of the potential use of LID at the site, if desired, would require additional work to evaluate subsurface conditions in the areas of any proposed facilities. This may include additional subsurface explorations to determine the extent and grain-size characteristics of the receptor horizon and the depth of shallow ground water. We also recommend that infiltration tests be completed within the footprint of any proposed facilities to determine a preliminary infiltration rate for design.

Infiltration testing would involve completion of Washington State Department of Ecology (Ecology) Pilot Infiltration Tests (PITs) at infiltration subgrade to measure the actual infiltration rate under saturated conditions. The PITs would typically be conducted using a 6-foot-diameter steel ring set into an excavation at the location of the infiltration facilities. Water would be discharged at a known rate into the ring for approximately 7 to 8 hours, and the saturated infiltration rate (hydraulic conductivity) would be calculated using a constant head analysis. A water truck or hydrant is typically used as the source of water for testing. This testing was not part of the current phase of work; however, we are available to conduct infiltration testing upon request.

II. GEOLOGIC HAZARDS AND MITIGATIONS

The following discussion of potential geologic hazards is based on the geologic, slope, and shallow ground water conditions, as observed and discussed herein.

5.0 LANDSLIDE HAZARDS AND MITIGATIONS

Issaquah Municipal Code (IMC) Section 18.10.390 defines Landslide Hazard Areas (LHA). Slopes south of the current proposed location for the new residential development are characterized by geometric criteria that qualifies for treatment as LHA based on our review of the King County GIS data. These slopes achieve the minimum inclination of 40 percent that is needed for classification as LHA. Based on the current concept design, these slopes are not within the immediate area of the proposed project. Therefore, no quantitative slope stability analysis has been completed and none is warranted, in our opinion.

6.0 SEISMIC HAZARDS AND MITIGATIONS

Earthquakes occur regularly in the Puget Lowland. Most of these events are small and are usually not felt by humans. However, large earthquakes do occur, as evidenced by the 2001, 6.8-magnitude event; the 1965, 6.5-magnitude event; and the 1949, 7.2-magnitude event. The 1949 earthquake appears to have been the largest in this region during recorded history and was centered in the Olympia area. Evaluation of earthquake return rates indicates that an earthquake of the magnitude between 5.5 and 6.0 is likely within a given 20-year period.

Generally, there are four types of potential geologic hazards associated with large seismic events: 1) surficial ground rupture, 2) seismically induced landslides, 3) liquefaction, and 4) ground motion. The potential for each of these hazards to adversely impact the proposed project is discussed below.

6.1 Surficial Ground Rupture

We reviewed a map of possible geologic fault traces on the United States Geological Survey (USGS) Interactive Fault Map. The site is located within the mapped limits of the Seattle Fault Zone but is not close to mapped potential faults.

6.2 Seismically Induced Landslides

It is our opinion that the potential risk of damage to the proposed development by seismically induced slope failures is low during a design-level seismic event, due to the lack of steep slopes in the immediate project area.

6.3 Liquefaction

Liquefaction is a process through which unconsolidated soil loses strength as a result of vibrations, such as those which occur during a seismic event. During normal conditions, the weight of the soil is supported by both grain-to-grain contacts and by the fluid pressure within the pore spaces of the soil below the water table. Extreme vibratory shaking can disrupt the grain-to-grain contact, increase the pore pressure, and result in a temporary decrease in soil shear strength. The soil is said to be liquefied when nearly all of the weight of the soil is supported by pore water pressure alone. Liquefaction can result in deformation of the sediment and settlement of overlying structures. Areas most susceptible to liquefaction include those areas underlain by non-cohesive silt and sand with low relative densities, accompanied by a shallow water table.

The subject site is underlain by loose, granular alluvium and recessional outwash sediments and relatively shallow ground water. The combination of loose granular sediments and shallow ground water poses a potential liquefaction risk. To assess the liquefaction risk and estimate settlement potential during a design-level seismic event, we performed a limited liquefaction hazard analysis for this site. Our liquefaction analysis was completed with the aid of LiquefyPro computer software Version 5.9a (2015) by CivilTech Corporation. This program accepts input for SPT data, ground water levels, soil unit weight, and the depth and grain-size distribution of the sediments of concern to calculate seismically induced settlement. The liquefaction analysis was conducted based on the subsurface conditions encountered in exploration borings EB-1W and EB-2. The following parameters were used during the analysis:

- Silt contents are based on laboratory testing of soil samples retrieved from exploration borings EB-1W and EB-2;
- Soil unit weights for granular soils are estimated based on the standard penetration number and on published ranges of soil unit weights in the project area;
- We used the Ishihara/Yoshimine analysis method in the LiquefyPro software;
- The peak horizontal ground acceleration value was retrieved from the USGS published United States Seismic Design Map for the specific location of the subject site.

Based on liquefaction analysis utilizing soil and ground water data from exploration borings EB-1W and EB-2, the subsurface conditions encountered at the site are predicted to experience liquefaction during a design-level seismic event. The liquefaction-induced settlement calculated for the site ranged from approximately 2 to 5 inches, and extends to a depth ranging from approximately 19 feet to the full depth explored in EB-1W (31.5 feet) below the ground surface, as shown on liquefaction analysis results pages included in the Appendix.

Preliminary design recommendations concerning use of structural fill to raise the grade of the site to mitigate liquefaction-induced settlement hazards are presented below in the "Site Preparation" section of this report.

In our opinion, buried utilities should be constructed with flexible joints where they enter the new building additions to limit the risk of water, gas, and other potentially hazardous pipe ruptures.

6.4 Ground Motion/Seismic Site Class (2015 *International Building Code*)

Structural design of the buildings should follow 2015 *International Building Code* (IBC) standards. We recommend that the project be designed in accordance with Site Class "D" as defined in IBC Table 20.3-1 of *American Society of Civil Engineers* (ASCE) *7 - Minimum Design Loads for Buildings and Other Structures*.

6.5 Erosion Control

Project plans should include implementation of temporary erosion controls in accordance with local standards of practice. Control methods should include limiting earthwork to seasonally drier periods, typically April 1 to October 31, use of perimeter silt fences, and straw mulch in exposed areas. Removal of existing vegetation should be limited to those areas that are required to construct the project, and new landscaping and vegetation with equivalent erosion mitigation potential should be established as soon as possible after grading is complete. During construction, surface water should be collected as close as possible to the source to minimize silt entrainment that could require treatment or detention prior to discharge. Timely implementation of permanent drainage control measures should also be a part of the project plans, and will help reduce erosion and generation of silty surface water onsite.

III. PRELIMINARY DESIGN RECOMMENDATIONS

7.0 INTRODUCTION

The lower portion of the site west of Tibbets Creek is underlain at shallow depths by loose and variable alluvium and recessional outwash sediments, and shallow ground water. The native sediments on this part of the site are not suitable to support foundation loads in their current condition. Existing fill was not encountered in any of our explorations completed for this study or for our study of the site in 2015. However, existing fill should be anticipated around existing structures and buried utilities. Existing fill, if encountered at the time of construction, is not suitable for support of new foundations, and warrants remedial preparation where it occurs below planned paving and similar lightly loaded structures.

The weak soils beneath the site extend below the ground water table. Ground water was encountered as shallow as 1 foot below existing ground level at the time of drilling exploration borings EB-1W and EB-2. Weak soils and shallow ground water result in risk of settlement due to liquefaction during a seismic event. Our analyses indicate that structures onsite are expected to experience approximately 2 to 5 inches of settlement during a design-level seismic event if no settlement mitigation measures are incorporated.

The following sections of this report provide preliminary recommendations concerning use of new engineered structural fill to raise the grade of the site to effectively mitigate static and seismic settlement risks and provide foundation support for the new residential development. Recommendations concerning site preparation, structural fill placement, building floor support, and drainage are also provided.

8.0 SITE PREPARATION

Site preparation should include removal of all grass, trees, brush, debris, and any other deleterious materials from structural areas. All existing fill around structures that have been demolished should be removed. If any heating oil storage tanks or other similar structures are discovered, they should be decommissioned and removed in accordance with applicable Ecology regulations. Existing septic systems should be decommissioned in accordance with King County Health Department regulations and removed from below planned structures. Any depressions below planned final grades caused by demolition activities should be backfilled with structural fill, as discussed under the "Structural Fill" section of this report.

The existing topsoil, grass, and shrubs should be removed from areas where new buildings, paving, or other structures are planned. The actual observed in-place depth of topsoil and sod at the exploration locations is presented on the exploration logs in the Appendix. After

stripping, remaining roots and stumps should be removed from structural areas. All soils disturbed by stripping and grubbing operations should be recompacted as described below for structural fill.

Once excavation to subgrade elevation is complete, placement of new structural fill should be addressed. Our limited liquefaction analyses indicate that structures onsite are expected to experience approximately 2 to 5 inches of settlement during a design-level seismic event if no settlement mitigation measures are incorporated. In order to mitigate the potential for settlement, we recommend raising the final grade of the site by 4 feet using engineered structural fill, as further described in the "Structural Fill" section of this report. The addition of structural fill provides confining pressure for the liquefiable zone reducing the potential for seismic-induced settlement to a tolerable amount. We recommend that project planning and budgeting take into account the need for a significant amount of new structural fill across the lower portion of the site.

8.1 Temporary Cut Slopes

In our opinion, stable construction slopes should be the responsibility of the contractor and should be determined during construction. For estimating purposes, however, temporary, unsupported cut slopes can be planned at 1.5H:1V (Horizontal:Vertical) in the alluvium, recessional outwash, and ice-contact sediments.

These slope angles are for areas where ground water seepage is not encountered, and assume that surface water is not allowed to flow across the temporary slope faces. If ground or surface water is present when the temporary excavation slopes are exposed, flatter slope angles or temporary shoring will be required. Our explorations completed for this study and our previous study of the site in 2015 encountered ground water seepage at depths ranging from 1 to 8 feet below the site. As is typical with earthwork operations, some sloughing and raveling may occur, and cut slopes may have to be adjusted in the field. In addition, WISHA/OSHA regulations should be followed at all times.

8.2 Site Disturbance

Most of the on-site soils contain fine-grained material, which makes them moisture-sensitive and subject to disturbance when wet. The contractor must use care during site preparation and excavation operations so that the underlying soils are not softened. If disturbance occurs, the softened soils should be removed and the area brought to grade with structural fill.

8.3 Winter Construction

The subsurface soils at this site contain variable amounts of silt and are considered highly moisture-sensitive. Portions of the recessional outwash sediments are anticipated to contain

somewhat less silt. Soils excavated onsite will likely require drying during favorable dry weather conditions to allow their reuse in structural fill applications. Care should be taken to seal all earthwork areas during mass grading at the end of each workday by grading all surfaces to drain and sealing them with a smooth-drum roller. Stockpiled soils that will be reused in structural fill applications should be covered whenever rain is possible.

If winter construction is expected, crushed rock fill could be used to provide construction staging areas where exposed soil is present. The stripped subgrade should be observed by the geotechnical engineer, and should then be covered with a geotextile fabric, such as Mirafi 500X or equivalent. Once the fabric is placed, we recommend using a crushed rock fill layer at least 10 inches thick in areas where construction equipment will be used.

9.0 STRUCTURAL FILL

All references to structural fill in this report refer to subgrade preparation, fill type, placement, and compaction of materials, as discussed in this section. If a percentage of compaction is specified under another section of this report, the value given in that section should be used. For backfill of buried utilities in the right-of-way, the backfill should be placed and compacted in accordance with the City of Issaquah codes and standards.

After stripping, planned excavation, and any required overexcavation have been performed to the satisfaction of the geotechnical engineer/engineering geologist, the surface of the exposed ground should be recompacted to a firm and unyielding condition. If the subgrade contains too much moisture, adequate recompaction may be difficult or impossible to obtain, and should probably not be attempted. In lieu of recompaction, the area to receive fill should be blanketed with washed rock or quarry spalls to act as a capillary break between the new fill and the wet subgrade. Where the exposed ground remains soft and further overexcavation is impractical, placement of an engineering stabilization fabric may be necessary to prevent contamination of the free-draining layer by silt migration from below.

After recompaction of the exposed ground is tested and approved, or a free-draining rock course is laid, structural fill may be placed to attain desired grades. Structural fill is defined as non-organic soil, acceptable to the geotechnical engineer, placed in maximum 8-inch loose lifts, with each lift being compacted to 95 percent of ASTM D-1557. The top of the compacted fill should extend horizontally outward a minimum distance of 3 feet beyond the locations of the perimeter footings or roadway edges before sloping down at a maximum angle of 2H:1V.

The contractor should note that any proposed fill soils must be evaluated by AESI prior to their use in fills. This would require that we have a sample of the material at least 72 hours in advance to perform a Proctor test and determine its field compaction standard.

Soils in which the amount of fine-grained material (smaller than the No. 200 sieve) is greater than approximately 5 percent (measured on the minus No. 4 sieve size) should be considered moisture-sensitive. The existing fill and alluvial soils are estimated to contain substantially more than 5 percent fine-grained material. Use of moisture-sensitive soil in structural fills should be limited to favorable dry weather and dry subgrade conditions. Construction equipment traversing the site when the soils are wet can cause considerable disturbance.

If fill is placed during wet weather or if proper compaction cannot be obtained, a select, import material consisting of a clean, free-draining gravel and/or sand should be used. Free-draining fill consists of non-organic soil, with the amount of fine-grained material limited to 5 percent by weight when measured on the minus No. 4 sieve fraction, and at least 25 percent retained on the No. 4 sieve.

In order to reuse excavated on-site soils in structural fill applications, it will be necessary to moisture-condition wet site soils by aeration and drying during favorable dry weather conditions. Alternatives to drying site soils include using imported granular soils suitable for use in structural fill, or treating wet soils with Portland cement.

10.0 FOUNDATIONS

Spread footings may be used for building support when they are founded on approved structural fill placed over the weak native soils, as described above. Recommendations regarding foundation support for the proposed bridge crossing Tibbets Creek are provided in Section 10.1 of this report.

For residential structures, footings may be designed for an allowable foundation soil bearing pressure of 2,000 pounds per square foot (psf), including both dead and live loads. An increase of one-third may be used for short-term wind or seismic loading. Perimeter footings should be buried at least 18 inches into the surrounding soil for frost protection. However, all foundations must penetrate to the prescribed bearing strata, and no foundations should be constructed in or above loose, organic, or existing fill soils.

Anticipated settlement of footings founded, as recommended, should be on the order of ¾ inch or less, with differential settlement of ½ inch or less. However, disturbed material not removed from footing trenches prior to footing placement could result in increased settlements. All footing areas should be inspected by AESI prior to placing concrete to verify that the foundation subgrades are undisturbed and construction conforms to the recommendations contained in this report. Such inspections may be required by the City of Issaquah. Perimeter footing drains should be provided, as discussed under the "Drainage Considerations" section of this report.

It should be noted that the area bounded by lines extending downward at 1H:1V from any footing must not intersect another footing or intersect a filled area that has not been compacted to at least 95 percent of ASTM D-1557. In addition, a 1.5H:1V line extending down and away from any footing must not daylight because sloughing or raveling may eventually undermine the footing. Thus, footings should not be placed near the edges of steps or cuts in the bearing soils.

10.1 Bridge Foundations

We understand that a single-lane pedestrian and vehicular bridge is proposed between the upper and lower portion of the project area to provide access to the additional four lots to the east of Tibbets Creek. We anticipate the subsurface soils near and within the creek bed will be loose and saturated, and will not be suitable for the direct support of the bridge foundations without the risk of post-construction settlement under both static and seismic conditions. Therefore, we recommend that the structure be supported on a deep pile foundation system, such as pipe piles, to transmit footing loads to suitable bearing sediments at depth. The following preliminary recommendations are based on the explorations completed for this study and our previous study in 2015. Additional deep exploration borings could be completed on the site to determine site-specific soil conditions at depth, where these deep foundations will be completed.

Pipe Piles

A deep foundation system consisting of small-diameter driven steel pipe piles is recommended for support of the bridge foundation. Pipe piles may consist of 4- or 6-inch-diameter pipe depending on the required structural loads. The piles should be galvanized steel pipe, driven with a suitable hydraulic hammer to the refusal criteria shown in Table 1. The following table provides required minimum hammer weights, refusal criteria, and allowable loads for pipe piles. Based on the subsurface conditions encountered in our exploration borings in the lower part of the site, pile lengths are estimated to be on the order of 30 to 40 feet. Actual driven lengths are unpredictable and may be substantially longer or shorter than estimated.

Table 1
Pipe Pile Design Parameters

Pipe Diameter (inches)	Wall Thickness	Minimum Hammer Size (pounds)	Refusal Criteria[1] (seconds)	Allowable Load[2] (kips)
4	Schedule 40	850	16	20
6	Schedule 40	1,100	20	30

[1] Refusal is defined as less than 1 inch of penetration in "X" seconds under constant driving.
[2] Allowable load for 4-inch or greater diameter piles to be verified by load tests (200 percent of allowable load) in accordance with *American Society for Testing and Materials* (ASTM) D-1145 "quick load test"; a minimum of 3 percent of piles require load testing.

Anticipated settlement of pipe pile-supported foundations should be less than ½ inch. The allowable load given above should be verified by load tests (200 percent of allowable load) in accordance with ASTM D-1145 "quick load test." Pile installation and load test(s) must be observed by AESI to verify that the design bearing capacity of the piles has been attained and that construction conforms to the recommendations contained herein. AESI, acting as the owner's field representative, would determine the required pile lengths, and keep records of pertinent installation data. The City of Issaquah will likely require such observations.

No lateral capacity would be provided by vertically installed pipe piles. Lateral resistance can be derived from passive soil resistance against the buried portion of the foundation (i.e., the grade beam) or from the installation of batter piles. Lateral resistance for batter piles should be taken as the horizontal component of the axial pile load. Batter piles are typically installed at a 1H:4V inclination.

11.0 FLOOR SUPPORT

If crawl-space floors are used, an impervious moisture barrier should be provided above the soil surface within the crawl space. Slab-on-grade floors may be used over medium dense to very dense native soils, or over structural fill placed as recommended in the "Site Preparation" and "Structural Fill" sections of this report. Slab-on-grade floors should be cast atop a minimum of 4 inches of washed pea gravel or washed crushed "chip" rock with less than 3 percent passing the U.S. No. 200 sieve to act as a capillary break. The floors should also be protected from dampness by covering the capillary break layer with an impervious moisture barrier at least 10 mils in thickness.

12.0 DRAINAGE CONSIDERATIONS

All footings, basement walls, and retaining walls should be provided with a drain at the footing elevation. Drains should consist of rigid, perforated, PVC pipe surrounded by washed pea gravel. The level of the perforations in the pipe should be set downward and at the bottom of the footing at all locations, and the drain collectors should be constructed with sufficient gradient to allow gravity discharge away from the buildings. In addition, all foundation walls taller than 3 feet should be lined with a minimum, 12-inch-thick, washed gravel blanket drain provided to within 1 foot of finish grade that ties into the footing drain. A prefabricated drainage mat is not an acceptable alternative to the gravel blanket drain unless the entire excavation backfill consists of free-draining structural fill. Roof and surface runoff should not discharge into the footing drain system, but should be handled by a separate, rigid, tightline drain.

In planning, exterior grades adjacent to foundations should be sloped downward away from the structures to achieve surface drainage. These recommendations apply to conventional shallow foundation walls and landscape walls less than about 4 feet tall. One should refer to the following section for walls up to 10 feet tall.

13.0 CAST-IN-PLACE RETAINING WALLS AND BASEMENT WALLS

All backfill behind foundation walls or around foundation units should be placed as per our recommendations for structural fill and as described in this section of the report. Horizontally backfilled walls that are free to yield laterally at least 0.1 percent of their height may be designed to resist active lateral earth pressure represented by an equivalent fluid equal to 35 pounds per cubic foot (pcf). Fully restrained, horizontally backfilled, rigid walls that cannot yield should be designed for at-rest conditions and an equivalent fluid of 50 pcf. Walls with sloping backfill up to a maximum gradient of 2H:1V should be designed using an equivalent fluid of 55 pcf for yielding conditions or 75 pcf for fully restrained conditions. If parking areas are adjacent to walls, a surcharge equivalent to 2 feet of soil should be added to the wall height in determining lateral design forces.

As required by the 2015 IBC, retaining wall design should include a seismic surcharge pressure in addition to the equivalent fluid pressures presented above. Considering the site soils and the recommended wall backfill materials, we recommend a seismic surcharge pressure of 8H and 10H psf, where H is the wall height in feet for the "active" and "at-rest" loading conditions, respectively. The seismic surcharge should be modeled as a rectangular distribution with the resultant applied at the midpoint of the walls.

The lateral pressures presented above are based on the conditions of a uniform backfill consisting of excavated on-site soils, or imported structural fill compacted to 90 percent of ASTM D-1557. A higher degree of compaction is not recommended, as this will increase the pressure acting on the walls. A lower compaction may result in settlement of the slab-on-grade or other structures supported above the walls. Thus, the compaction level is critical and must be tested by our firm during placement. Surcharges from adjacent footings or heavy construction equipment must be added to the above values. Perimeter footing drains should be provided for all retaining walls, as discussed under the "Drainage Considerations" section of this report.

It is imperative that proper drainage be provided so that hydrostatic pressures do not develop against the walls. This would involve installation of a minimum 1-foot-wide blanket drain to within 1 foot of finish grade for the full wall height using imported, washed gravel against the walls. If situations exist where a footing drain is not feasible for a foundation wall or retaining wall, the wall should be designed for saturated lateral earth pressures and a hydrostatic surcharge. We should be allowed to offer situation-specific recommendations if this situation

arises. The use of drainage improvements as recommended herein does not alleviate the need for waterproofing where finished spaces are planned on the interior side of basement walls. Backfilled walls with finished interior space should be waterproofed in accordance with recommendations of the building designer.

13.1 Passive Resistance and Friction Factors

Lateral loads can be resisted by friction between the foundation and the natural alluvial soils or supporting structural fill soils, or by passive earth pressure acting on the buried portions of the foundations. The foundations must be backfilled with structural fill and compacted to at least 95 percent of the maximum dry density to achieve the passive resistance provided below. We recommend the following allowable design parameters:

- Passive equivalent fluid = 250 pcf
- Coefficient of friction = 0.35

14.0 PAVEMENT RECOMMENDATIONS

We understand that the current concept will include construction of new paved parking lots and access roads. At this time we do not anticipate that new paving will be completed on Frontage Street (SR 900). If new paving is planned on Frontage Street we should be allowed to make situation-specific paving recommendations.

After the area to be paved is stripped, any organic soils are removed, and the soils are recompacted, the area should be proof-rolled with a loaded truck under the observation of AESI. Any soft, wet, organic, or yielding areas should be repaired as recommended during construction. If warranted, engineering stabilization fabric, such as Mirafi 500X (or equivalent), should be placed over the subgrade with the edges overlapped in accordance with the manufacturer's recommendations. Following subgrade preparation, clean, free-draining structural fill should be placed over the fabric and compacted to 95 percent of ASTM D-1557. Where fabric is exposed, spreading should be performed such that the dozer remains on the fill material and is not allowed to operate on uncovered fabric. When 12 inches of fill has been placed, the fabric should be proof-rolled with a loaded dump truck to pretension the fabric and identify soft spots in the fill. Upon completing the proof-rolling operation, additional structural fill should be placed and compacted to attain desired grades.

For driveways and new paving serving passenger cars within the plat, we recommend a paving section consisting of 3 inches of Class ½-inch Hot Mix Asphalt (HMA) underlain by 4 inches of crushed surfacing base course (CSBC). Alternatively asphalt treated base (ATB) or Class ¾-inch HMA could be used for construction access followed by repair of any construction damage and final surfacing. If this alternative is used, we recommend a minimum of 2 inches of CSBC to

serve as a working surface and a minimum of 3 inches of ATB. Final surfacing should consist of 2 inches of Class ½-inch HMA after any construction damage has been repaired.

15.0 DETENTION VAULT CONSIDERATIONS

The current design concept identifies a detention vault on the north part of the site. The detention vault footings may be designed using an allowable foundation soil bearing pressure of 3,000 psf. The detention vaults may be designed to resist active or at-rest lateral earth pressures as described in Section 13.0 "Cast-in-Place Retaining Walls and Basement Walls" of this report assuming drained conditions. If it is not possible to construct the vault with a foundation drain, hydrostatic surcharges must be incorporated and a lateral pressure of 90 pcf (equivalent fluid) should be assumed, representing combined soil and hydrostatic loads, under active conditions. If paved surfaces are to be constructed above the backfill soils, lateral pressures should include a uniform traffic surcharge of equivalent to 2 additional feet of soil depth. At this time the elevation of the vault is not known. We recommend taking into consideration the depth of the water table and the effects of buoyancy. We can provide recommendations when the design has been completed.

16.0 PROJECT DESIGN AND CONSTRUCTION MONITORING

At the time of this report, site development/grading plans had not been developed, and our recommendations should be considered preliminary. We are available to provide additional geotechnical consultation as the project design develops and possibly changes from that upon which this report is based. We recommend that AESI perform a geotechnical review of the plans prior to construction. In this way, our earthwork and foundation recommendations may be properly interpreted and implemented in the design.

We are also available to provide geotechnical engineering and monitoring services during construction. The integrity of the foundations for buildings and of new rockeries and retaining walls depends on proper site preparation and construction procedures. In addition, engineering decisions may have to be made in the field in the event that variations in subsurface conditions become apparent. Construction monitoring services are not part of the current scope of work. If these services are desired, please let us know, and we will prepare a cost proposal.

We have enjoyed working with you on this study and are confident that these preliminary recommendations will aid in the successful completion of your project. If you should have any questions or require further assistance, please do not hesitate to call.

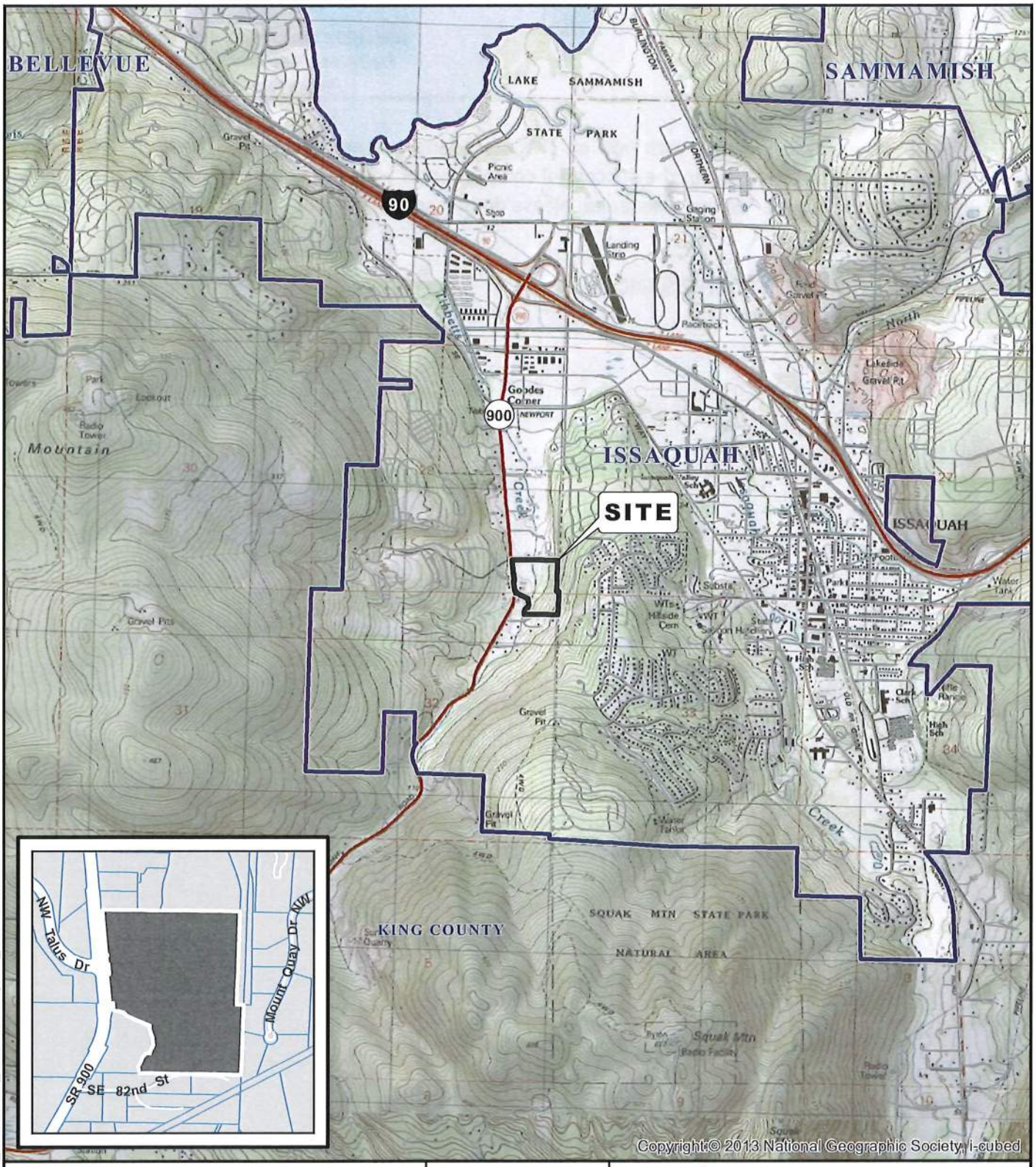
Sincerely,
ASSOCIATED EARTH SCIENCES, INC.
Kirkland, Washington

MATTHEW A. MILLER
STATE OF WASHINGTON
30281
REGISTERED
PROFESSIONAL ENGINEER
5-12-17

Daniel D. Voth
Staff Geologist

Matthew A. Miller, P.E.
Principal Engineer

Attachments:	Figure 1:	Vicinity Map
	Figure 2:	Site and Exploration Plan
	Appendix:	Exploration Logs
		Laboratory Test Results
		Liquefaction Hazard Analysis Results



DATA SOURCES / REFERENCES:
USGS: 24K SERIES TOPOGRAPHIC MAPS
KING CO: STREETS, CITY LIMITS, PARCELS 2016

LOCATIONS AND DISTANCES SHOWN ARE APPROXIMATE

N

0 1500 3000
FEET

NOTE: BLACK AND WHITE REPRODUCTION OF THIS COLOR ORIGINAL MAY REDUCE ITS EFFECTIVENESS AND LEAD TO INCORRECT INTERPRETATION

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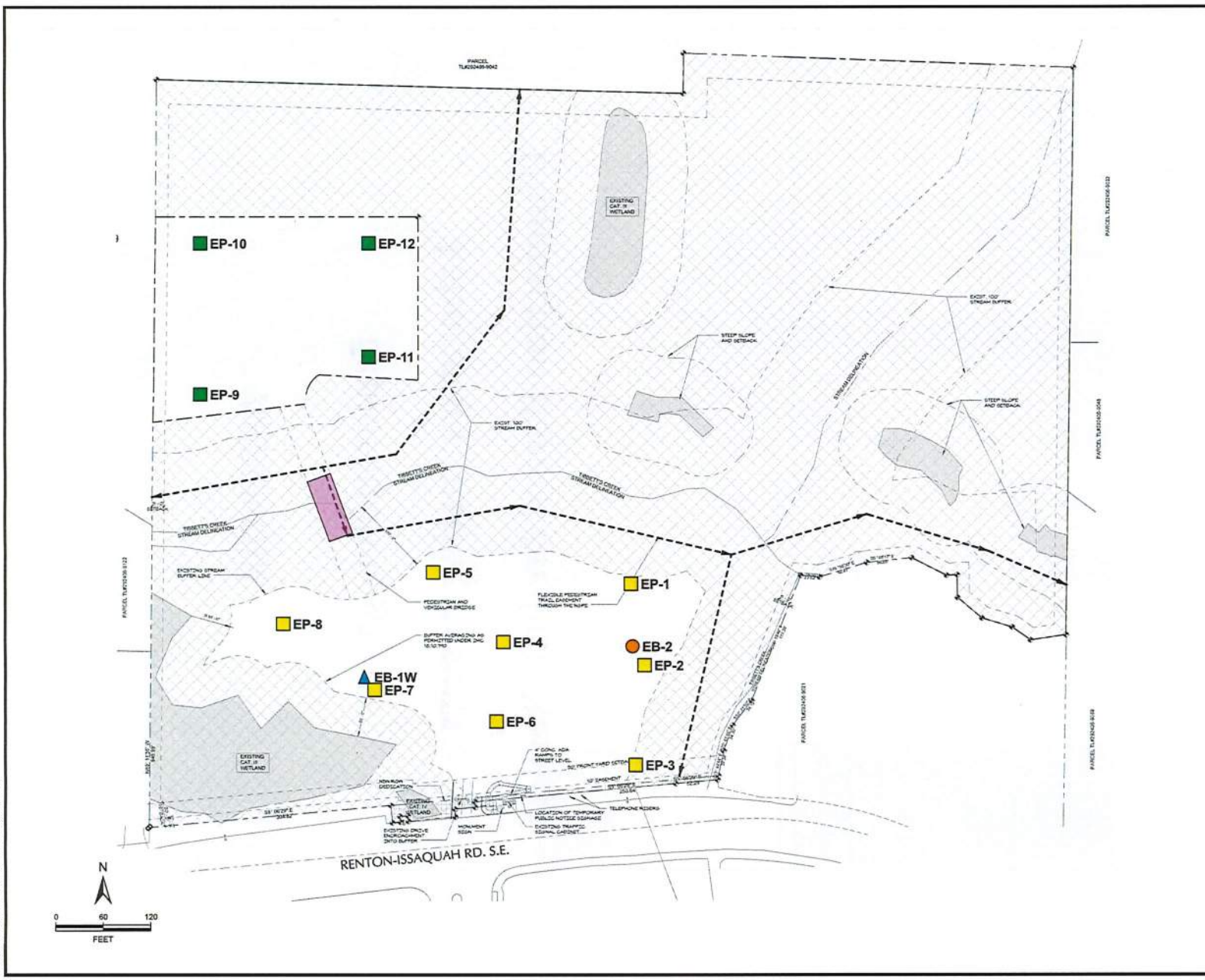
VICINITY MAP

BURNSTEAD MULTI-FAMILY
ISSAQUAH, WASHINGTON

PROJ NO.	DATE:	FIGURE:
KE170037A	2/17	1

Document Path: G:\GIS_Projects\aTemplates\VM_Template\VM_MXD\170037 Fig1 VM_Burnstead.mxd



LEGEND:

- EB — EXPLORATION BORING - 2017
- EB — MONITORING WELL - 2017
- EP — EXPLORATION PIT - 2017
- EP — EXPLORATION PIT - 2015
- PROPOSED SINGLE LANE BRIDGE

CONTOUR INTERVAL = N/A

NOTE: LOCATION AND DISTANCES SHOWN ARE APPROXIMATE.

NOTES:
1. BASE MAP REFERENCE: WATTENBARGER ARCHITECTURE, SILVERADO-ISSAQUAH, SITE PARCEL PLAN, SHEET A-2.2, 10/21/16

BLACK AND WHITE REPRODUCTION OF THIS COLOR ORIGINAL MAY REDUCE ITS EFFECTIVENESS AND LEAD TO INCORRECT INTERPRETATION.

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SITE AND EXPLORATION PLAN

BURNSTEAD MULTI-FMILY
ISSAQUAH, WASHINGTON

PROJ NO.	DATE:	FIGURE:
170037E001	5/17	2

170037 Burnstead \ 170037E001 F2 Site-Exp's 5-17.cdr

APPENDIX

Exploration Logs

Laboratory Testing Results

Liquefaction Hazard Analysis Results

Coarse-Grained Soils - More than 50% [1] Retained on No. 200 Sieve	Gravels - More than 50% [1] of Coarse Fraction Retained on No. 4 Sieve	≤5% Fines [5]	GW	Well-graded gravel and gravel with sand, little to no fines
			GP	Poorly-graded gravel and gravel with sand, little to no fines
		≥12% Fines [5]	GM	Silty gravel and silty gravel with sand
			GC	Clayey gravel and clayey gravel with sand
	Sands - 50% [1] or More of Coarse Fraction Passes No. 4 Sieve	≤5% Fines [5]	SW	Well-graded sand and sand with gravel, little to no fines
			SP	Poorly-graded sand and sand with gravel, little to no fines
		≥12% Fines [5]	SM	Silty sand and silty sand with gravel
			SC	Clayey sand and clayey sand with gravel
Fine-Grained Soils - 50% [1] or More Passes No. 200 Sieve	Silts and Clays Liquid Limit Less than 50		ML	Silt, sandy silt, gravelly silt, silt with sand or gravel
			CL	Clay of low to medium plasticity; silty, sandy, or gravelly clay, lean clay
			OL	Organic clay or silt of low plasticity
	Silts and Clays Liquid Limit 50 or More		MH	Elastic silt, clayey silt, silt with micaceous or diatomaceous fine sand or silt
			CH	Clay of high plasticity, sandy or gravelly clay, fat clay with sand or gravel
			OH	Organic clay or silt of medium to high plasticity
Highly Organic Soils			PT	Peat, muck and other highly organic soils

Terms Describing Relative Density and Consistency

Coarse-Grained Soils

Density	SPT[2] blows/foot
Very Loose	0 to 4
Loose	4 to 10
Medium Dense	10 to 30
Dense	30 to 50
Very Dense	>50

Fine-Grained Soils

Consistency	SPT[2] blows/foot
Very Soft	0 to 2
Soft	2 to 4
Medium Stiff	4 to 8
Stiff	8 to 15
Very Stiff	15 to 30
Hard	>30

Test Symbols

G = Grain Size
M = Moisture Content
A = Atterberg Limits
C = Chemical
DD = Dry Density
K = Permeability

Component Definitions

Descriptive Term	Size Range and Sieve Number
Boulders	Larger than 12"
Cobbles	3" to 12"
Gravel	3" to No. 4 (4.75 mm)
Coarse Gravel	3" to 3/4"
Fine Gravel	3/4" to No. 4 (4.75 mm)
Sand	No. 4 (4.75 mm) to No. 200 (0.075 mm)
Coarse Sand	No. 4 (4.75 mm) to No. 10 (2.00 mm)
Medium Sand	No. 10 (2.00 mm) to No. 40 (0.425 mm)
Fine Sand	No. 40 (0.425 mm) to No. 200 (0.075 mm)
Silt and Clay	Smaller than No. 200 (0.075 mm)

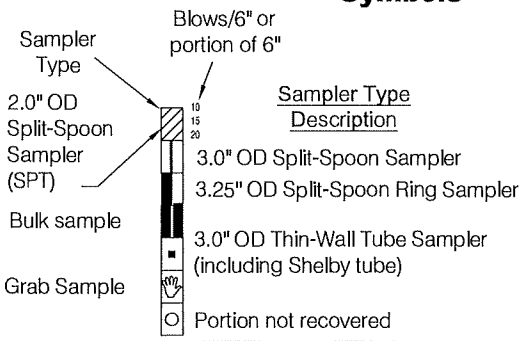
[3] Estimated Percentage

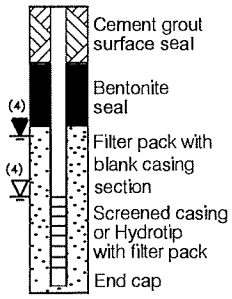
Component	Percentage by Weight
Trace	<5
Some	5 to <12
Modifier (silty, sandy, gravelly)	12 to <30
Very *modifier* (silty, sandy, gravelly)	30 to <50

Moisture Content

Dry - Absence of moisture, dusty, dry to the touch
Slightly Moist - Perceptible moisture
Moist - Damp but no visible water
Very Moist - Water visible but not free draining
Wet - Visible free water, usually from below water table

Symbols





[1] Percentage by dry weight
[2] (SPT) Standard Penetration Test (ASTM D-1586)
[3] In General Accordance with Standard Practice for Description and Identification of Soils (ASTM D-2488)
[4] Depth of ground water
▼ ATD = At time of drilling
▽ Static water level (date)
[5] Combined USCS symbols used for fines between 5% and 12%

Classifications of soils in this report are based on visual field and/or laboratory observations, which include density/consistency, moisture condition, grain size, and plasticity estimates and should not be construed to imply field or laboratory testing unless presented herein. Visual-manual and/or laboratory classification methods of ASTM D-2487 and D-2488 were used as an identification guide for the Unified Soil Classification System.

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EXPLORATION LOG KEY

FIGURE A1

blocks \ dwg \ log_key.dwg LAYOUT: Layout 4 -2014 Qty Chng

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Geologic & Monitoring Well Construction Log

Project Number	Well Number	Sheet
KE170037A	EB-1W	1 of 1

Project Name	Burnstead Mult-Family	Location	Issaquah, WA
Elevation (Top of Well Casing)	155	Surface Elevation (ft)	155.00
Water Level Elevation	154	Date Start/Finish	2/9/17,2/9/17
Drilling/Equipment	Gregory / Track	Hole Diameter (in)	8 inches
Hammer Weight/Drop	140# / 30"		

Depth (ft)	Water Level	WELL CONSTRUCTION	ST	Blows/ 6"	Graphic Symbol	DESCRIPTION
	▼	Flush mount monument				**Grass / Topsoil**
						Quaternary Alluvium
5		Grout 0 to 15 feet		1 4 6		Loose to medium dense, wet, dark brown to gray, very silty, gravelly, fine to coarse SAND, some organics (SM).
10		2-inch I.D. Sch 40 PVC casing 0.5 to 20.5 feet		6 2 2		Very loose to loose, wet, dark gray, very silty, fine to medium SAND, some gravel (SM).
15		Bentonite chips 15 to 17 feet		12 13 9		**Vashon Recessional Outwash** Medium dense, wet, oxidized gray, gravelly, silty, fine to coarse SAND (SM).
20		10x20 silica sand 17 to 31.5 feet		14 9 9		Becomes very gravelly.
25		2-inch I.D. Sch 40 PVC well screen, 0.020-inch slot width 20.5 to 30.5 feet		4 4 8		No recovery due to rock.
30		Threaded end cap		0 4 6		Loose to medium dense, wet, brown, silty, fine to medium SAND (SM).
		Well tag #BJZ 725				Boring terminated at 31.5 feet. Well completed at 30.5 feet on 2/9/17.
35						

Sampler Type (ST):

- 2" OD Split Spoon Sampler (SPT)
- 3" OD Split Spoon Sampler (D & M)
- Grab Sample
- No Recovery
- Ring Sample
- Shelby Tube Sample

M - Moisture

Water Level ()

Water Level at time of drilling (ATD)

Logged by: DV

Approved by: CJK

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Exploration Log

Project Number	Exploration Number	Sheet
KE170037A	EB-2	1 of 1

Project Name: Burnstead Mult-Family
Location: Issaquah, WA
Driller/Equipment: Gregory / Track
Hammer Weight/Drop: 140# / 30"

Ground Surface Elevation (ft): 170
Datum: Google Earth
Date Start/Finish: 2/9/17,2/9/17
Hole Diameter (in): 8 inches

Depth (ft)	ST	Samples	Graphic Symbol	DESCRIPTION	Well Completion	Water Level	Blows/6"	Blows/Foot (10 20 30 40)	Other Tests
				Grass / Topsoil					
				Quaternary Alluvium					
5		S-1		Dense, wet, grayish brown, silty, sandy GRAVEL (GM).			31 25 12	▲37	
10		S-2		Loose, wet, brown to gray, very silty, fine to coarse SAND, some gravel (SM).			2 4 5	▲9	
15		S-3		Soft to medium stiff, wet, dark gray, sandy SILT, trace to some gravel, some organic layers (ML).			0 0 4	▲4	
20		S-4		Becomes organic rich.			4 8 7	▲15	
25		S-5		Very dense, wet, dark gray, silty, fine to medium SAND, some gravel (SM).			8 29 47	▲76	
30		S-6		Becomes medium dense, very silty.			10 9 8	▲17	
				Bottom of exploration boring at 31.5 feet					
35									

Sampler Type (ST):

- 2" OD Split Spoon Sampler (SPT)
- 3" OD Split Spoon Sampler (D & M)
- Grab Sample
- No Recovery
- Ring Sample
- Shelby Tube Sample
- M - Moisture
- Water Level ()
- Water Level at time of drilling (ATD)

Logged by: DV
Approved by: CJK

LOG OF EXPLORATION PIT NO. EP-1

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered. **DESCRIPTION** Elev: 158 feet
	Topsoil
	Quaternary Alluvium
1	Loose, very moist, light brown, silty fine SAND, trace organics; stratified (SM).
2	
3	
4	
5	
6	Loose to medium dense, very moist, reddish brown and gray, very silty fine SAND to fine to medium SAND, some silt, some gravel, trace organics; stratified (SM/SP-SM).
	Vashon Recessional Outwash
7	Loose to medium dense, wet, gray, gravelly, silty to very silty, fine SAND; stratified (SM).
8	
9	
10	Loose to medium dense, wet, gray, gravelly, silty fine to coarse SAND; stratified (SM).
11	
12	Loose to medium dense, wet, brown to gray, very silty fine SAND to sandy SILT, trace gravel; stratified (SM/ML).
13	
14	Bottom of exploration pit at depth 13 feet Seepages at 8 feet and below. Slight caving below 4 feet.
15	
16	
17	
18	
19	
20	

Burnstead Multi-Family
Issaquah, WA

Logged by: LDM
Approved by: CJK

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Project No. 170037E001
3/9/15

KCTP3 170037.GPJ May 11, 2017

LOG OF EXPLORATION PIT NO. EP-2

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered. **DESCRIPTION** Elev: 165 feet
	Topsoil
1	**Quaternary Alluvium**
2	Loose, very moist, light brown, very silty fine SAND, trace organics; stratified (SM).
3	
4	
5	Loose, very moist, mottled brown, silty to very silty fine SAND, trace organics; stratified (SM).
6	**Vashon Recessional Outwash**
7	
8	Medium dense, wet, brown, gravelly, silty fine to coarse SAND, some cobbles; stratified (SM).
9	
10	As above with lenses (< 6 inches thick) of sandy silt and very silty fine to medium sand.
11	
12	Medium dense, wet, brown, gravelly fine to coarse SAND, some silt, some cobbles; stratified (SW-SM).
13	
14	Bottom of exploration pit at depth 13 feet Seepage at 8 feet and below. Moderate caving below 5 to 6 feet.
15	
16	
17	
18	
19	
20	

Burnstead Multi-Family
Issaquah, WA

Logged by: LDM
Approved by: CJK

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Project No. 170037E001
3/9/15

LOG OF EXPLORATION PIT NO. EP-3

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered. **DESCRIPTION** Elev: 170 feet
	Vashon Recessional Outwash
1	Loose, very moist, dark brown grading down to brown, silty fine SAND; stratified (SM).
2	Medium dense, moist, brown, very sandy, fine to coarse GRAVEL, some cobbles, trace silt; stratified (GW).
3	
4	
5	Medium dense, wet, mottled reddish-brown, very gravelly, silty fine to coarse SAND to fine to coarse SAND, some silt; stratified (SM/SW-SM).
6	
7	
8	
9	
10	
11	
12	Bottom of exploration pit at depth 11 feet Seepage at 5 feet and below. Moderate caving below 2 feet.
13	
14	
15	
16	
17	
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20	

Burnstead Multi-Family
Issaquah, WA

Logged by: LDM
Approved by: CJK

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Project No. 170037E001
3/9/15

LOG OF EXPLORATION PIT NO. EP-4

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered. **DESCRIPTION** Elev: 159 feet
	Topsoil
	Quaternary Alluvium
1	Loose, moist, brown, fine to medium SAND, trace silt; stratified (SP).
2	
3	Loose, very moist, brown, very silty fine SAND to SILT, trace organics; stratified (SM/ML).
4	Very moist to wet.
5	Loose, very moist, brown, silty fine SAND, trace organics; stratified (SM).
6	Wet and gravel layer (1 foot thick)
7	Medium stiff, very moist to wet, SILT with trace organic debris (roots) interbedded with gravelly, silty fine to coarse SAND, some cobbles (ML/SM).
8	**Vashon Recessional Outwash**
9	Medium dense, wet, brown, gravelly fine to coarse SAND, some silt to silty, gravelly fine to coarse sand, some cobbles; stratified (SW-SM/SM).
10	
11	
12	
13	
14	Bottom of exploration pit at depth 13.5 feet Seepage at approximately 6 feet and below. Moderate caving below 5 to 6 feet.
15	
16	
17	
18	
19	
20	

Burnstead Multi-Family
Issaquah, WA

Logged by: LDM
Approved by: CJK

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Project No. 170037E001
3/9/15

LOG OF EXPLORATION PIT NO. EP-5

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered. **DESCRIPTION** Elev: 151 feet
	Quaternary Alluvium
1	Loose, very moist, dark brown, silty to very silty fine SAND, trace organics; stratified (SM).
2	
3	
4	
5	Soft to medium stiff, very moist, gray with reddish mottling, SILT, trace fine to coarse sand, trace organics; stratified (ML).
6	
7	
8	Contact ranges from 2 to 8 feet. Quaternary Alluvium thickens to east closer to creek.
	Vashon Recessional Outwash
9	Medium dense, wet, brown, silty, gravelly fine to coarse SAND; stratified (SW).
10	
11	Bottom of exploration pit at depth 10 feet Seepage at 4 to 5 feet and below. Moderate caving in gravel 2 to 4 feet and below.
12	
13	
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Burnstead Multi-Family
Issaquah, WA

Logged by: LDM
Approved by: CJK

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Project No. 170037E001
3/9/15

LOG OF EXPLORATION PIT NO. EP-6

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered. **DESCRIPTION** Elev: 160 feet
	Vashon Recessional Outwash
1	Loose, moist, brown, silty fine to medium SAND, some gravel; stratified with layers of gravelly fine to coarse sand, some silt (SM/SP-SM).
2	
3	Gravel layer (1 foot thick).
4	
5	Very moist to wet.
6	Loose, wet, brown to gray, silty fine sand; stratified (SM).
7	
8	Loose to medium dense, wet, mottled brown, gravelly fine to coarse SAND, some silt (SW-SM).
9	
10	Loose to medium dense, wet, brown, gravelly, silty fine to coarse SAND; stratified (SW).
11	
12	**Vashon Ice-Contact**
	Loose, very moist to wet, gray, very silty fine SAND, trace medium to coarse sand; diamict (SM).
13	
14	Bottom of exploration pit at depth 13 feet Wet at 4 to 5 feet and below. Heavy seepage at 9 to 10 feet. Moderate to heavy caving below 6 to 8 feet.
15	
16	
17	
18	
19	
20	

Burnstead Multi-Family
Issaquah, WA

Logged by: LDM
Approved by: CJK

associated earth sciences incorporated

Project No. 170037E001
3/9/15

LOG OF EXPLORATION PIT NO. EP-7

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered. **DESCRIPTION** Elev: 152 feet
	Quaternary Alluvium
1	Loose, very moist to wet, reddish brown to gray, silty fine to coarse SAND interbedded with very silty fine SAND, trace organics (SM).
2	
3	
4	
5	
6	Loose, wet, gray, silty fine to coarse SAND, some gravel, with lens (1 foot thick) of organic rich silty sand (SM).
7	
8	Loose to medium dense, wet, reddish brown, silty, gravelly fine to coarse SAND, trace organics; stratified (SM).
9	
10	
11	
12	Loose to medium dense, wet, gray, silty to very silty, fine SAND, trace organics; stratified (SM).
13	
14	Bottom of exploration pit at depth 13 feet Seepage at 6 feet and below. Heavy seepage at approximately 10 feet. Moderate caving below 3 to 4 feet.
15	
16	
17	
18	
19	
20	

Burnstead Multi-Family
Issaquah, WA

Logged by: LDM
Approved by: CJK

associated earth sciences incorporated

Project No. 170037E001
3/9/15

LOG OF EXPLORATION PIT NO. EP-8

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered. **DESCRIPTION** Elev: 146 feet
	Quaternary Alluvium
1	
2	Loose, moist, brown, fine SAND grading to fine to coarse SAND some silt, some gravel, with silty layers (2 to 6 inches thick), trace organics; stratified (SP).
3	
4	Becomes silty.
5	Loose, wet, greenish-gray with reddish-brown mottling, silty to very silty, fine SAND, some fine to coarse gravel, trace organics; stratified (SM).
6	
7	
8	
9	Loose, wet, gray, fine SAND, trace silt interbedded with soft to medium stiff, wet, gray, SILT and very silty fine SAND, trace organics (SP/ML/SM).
10	Buried log at 10 feet, approximately 1-foot diameter.
11	
12	
13	
14	Loose, wet, gray, gravelly, silty medium to coarse SAND (SM).
15	
16	Bottom of exploration pit at depth 15 feet Seepage at approximately 5 feet and below. Heavy seepage at approximately 7 to 8 feet. Moderate caving.
17	
18	
19	
20	

Burnstead Multi-Family
Issaquah, WA

Logged by: LDM
Approved by: CJK

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Project No. 170037E001
3/9/15

LOG OF EXPLORATION PIT NO. EP-9

Depth (ft)

This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.

DESCRIPTION

Elev: 155 feet

Topsoil

Vashon Recessional Outwash

1 Medium dense, moist, brown, silty, fine to coarse SAND, some gravel; stratified (SM).

2

3

4

5 Medium dense to dense, moist, brownish gray, gravelly, fine to coarse SAND, some silt; stratified (SP-SM).

6

7

8

9 Bottom of exploration pit at depth 8 feet
No seepage. Minor caving from 1 to 4 feet.

10

11

12

13

14

15

16

17

18

19

20

Burnstead Multi-Family
Issaquah, WA

Logged by: DV

Approved by: CJK

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Project No. 170037E001

4/25/17

KCTP3 170037.GPJ May 11, 2017

LOG OF EXPLORATION PIT NO. EP-10

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered. **DESCRIPTION** Elev: 175 feet
	Topsoil
1	**Vashon Ice-Contact**
2	Medium dense, moist to very moist, mottled gray, silty to very silty, fine to medium SAND, trace to some gravel; stratified (SM).
3	
4	
5	
6	Becomes dense to very dense, brownish gray.
7	
8	
9	Bottom of exploration pit at depth 8 feet No seepage. No caving.
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	

Burnstead Multi-Family
Issaquah, WA

Logged by: DV
Approved by: CJK

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Project No. 170037E001
4/25/17

LOG OF EXPLORATION PIT NO. EP-11

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered. **DESCRIPTION** Elev: 180 feet
	Topsoil
	Vashon Recessional Outwash
1	Medium dense, moist, brown, silty, fine to coarse SAND, some gravel; stratified (SM).
2	
3	
4	
5	Medium dense to dense, moist, brownish gray, sandy GRAVEL, some silt; stratified (GP-GM).
6	
7	
8	
9	Bottom of exploration pit at depth 8 feet No seepage. Minor caving from 2 to 5 feet.
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	

Burnstead Multi-Family
Issaquah, WA

Logged by: DV
Approved by: CJK

associated earth sciences incorporated

Project No. 170037E001
4/25/17

LOG OF EXPLORATION PIT NO. EP-12

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered. **DESCRIPTION** Elev: 200 feet
	Topsoil
1	**Vashon Recessional Outwash**
	Medium dense, moist, brown, silty, gravelly, fine to coarse SAND; stratified (SM).
2	
3	
4	
5	Becomes medium dense to dense, brownish gray.
6	
7	
8	
9	Bottom of exploration pit at depth 8 feet No seepage. Minor caving from 1 to 5 feet.
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	

Burnstead Multi-Family
Issaquah, WA

Logged by: DV
Approved by: CJK

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Project No. 170037E001
4/25/17

Particle Size Distribution Report

	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○				0.5	14.2	78.6	6.6	
□			5.0	3.3	6.2	28.7	54.0	

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○		EB-1W	30'	poorly graded sand with silt	SP-SM
□		EB-2	15'	sandy silt	ML

These results are for the exclusive use of the client for whom they were obtained. They apply only to the samples tested and are not indicitive of apparently identical samples.

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Client:

Project: Burnstead Multi Family

Project No.: KE170037A

Figure

Tested By: _____ **Checked By:** _____

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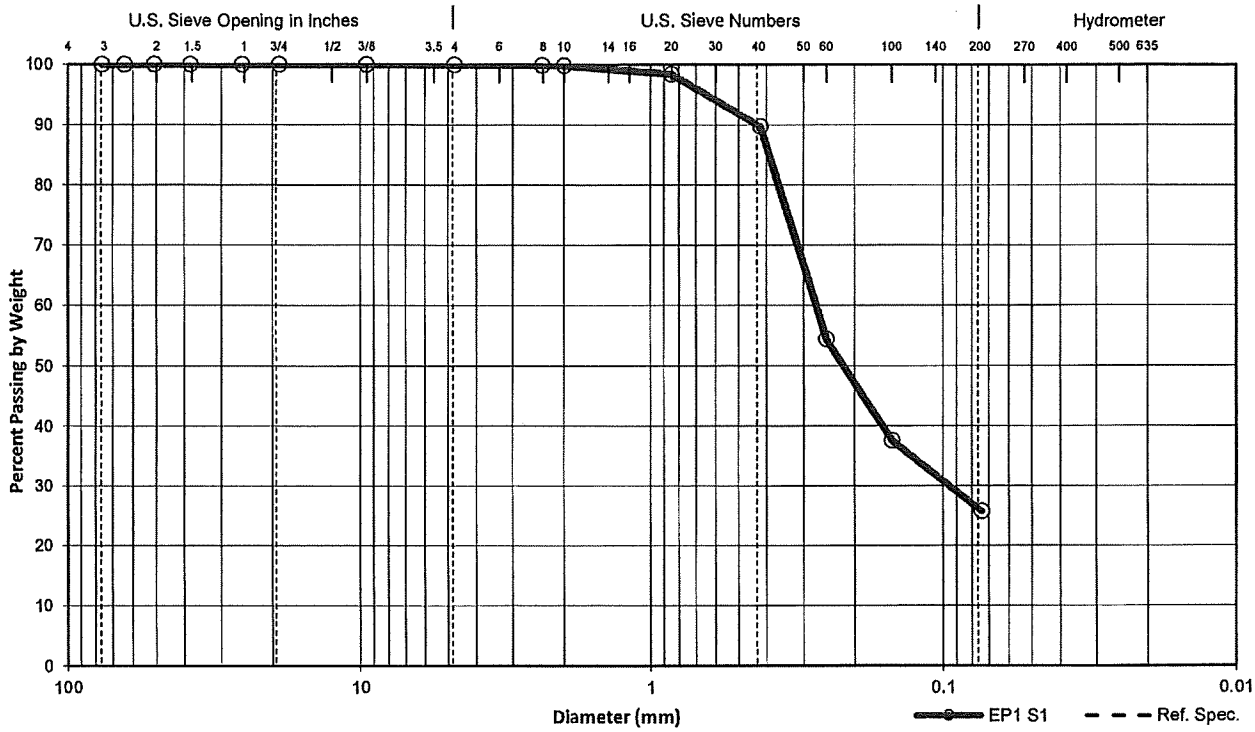
GRAIN SIZE ANALYSIS - MECHANICAL ASTM D422

Project Name	Project Number	Date Sampled	Date Tested	Tested By
Silverado Memory Care	**KE150106A**	**3/9/2015**	**3/10/2015**	**M5**
Sample Source	Sample No.	Depth (ft)	Soil Description	
	EP1 51	**5'**	**silty SAND (SM)**	
Total Sample Dry Wt. (g)	Moisture Content (%)	D_{10} (mm)	Reference Specification	
465.5	**28**	**~0.02**		



Cobb.	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

Sieve. No.	Diam. (mm)	Cum. Wt. Ret. (g)	% Ret. by Wt.	% Passing by Wt.	% Specs. Pass. by Wt.	
					Min	Max
3	76.1		0.0	100.0		
2.5	64		0.0	100.0		
2	50.8		0.0	100.0		
1.5	38.1		0.0	100.0		
1	25.4		0.0	100.0		
3/4	19		0.0	100.0		
3/8	9.51		0.0	100.0		
#4	4.76		0.0	100.0		
#8	2.38	0.5	0.1	99.9		
#10	2	0.7	0.1	99.9		
#20	0.85	7.6	1.6	98.4		
#40	0.42	47.7	10.2	89.8		
#60	0.25	212.2	45.6	54.4		
#100	0.149	290.6	62.4	37.6		
#200	0.074	345.7	74.3	25.7		

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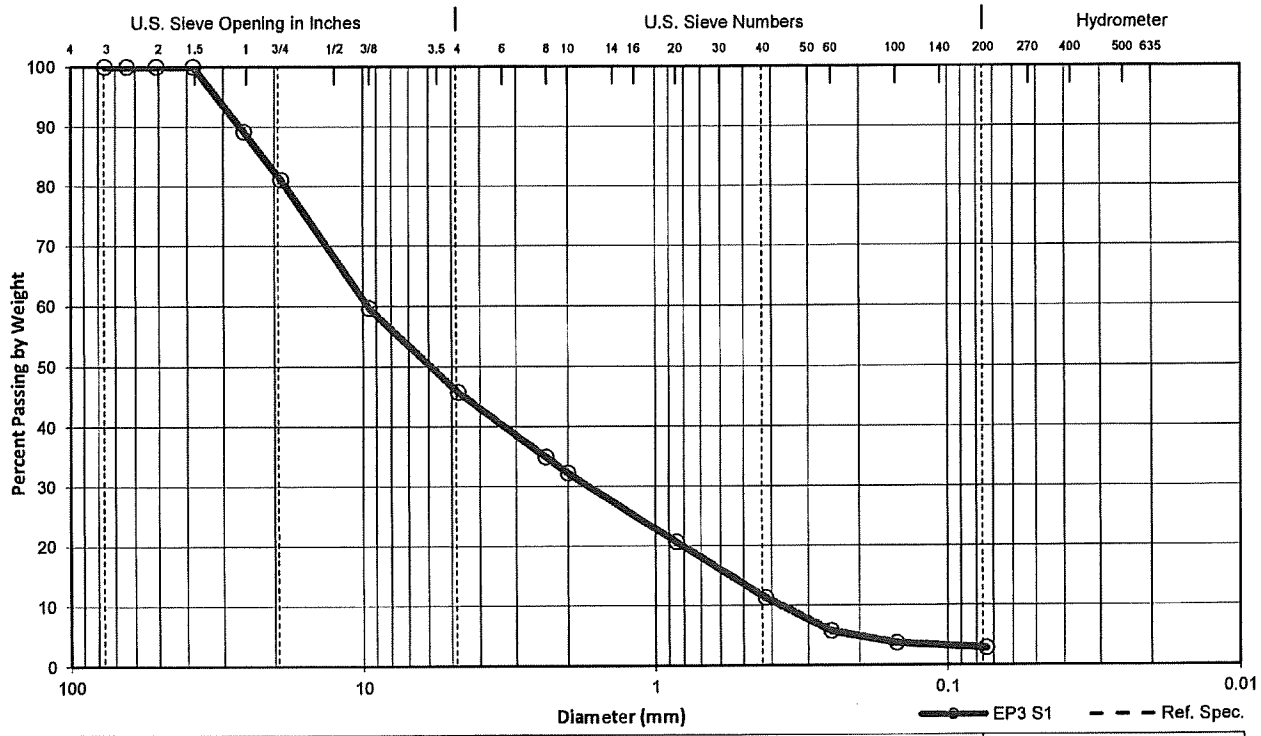
GRAIN SIZE ANALYSIS - MECHANICAL ASTM D422

Project Name	Project Number	Date Sampled	Date Tested	Tested By
Silverado Memory Care	KE150106A	3/9/2015	3/10/2015	MS
Sample Source	Sample No.	Depth (ft)	Soil Description	
	EP3 S1	2-3'	very sandy GRAVEL, trace silt (GP)	
Total Sample Dry Wt. (g)	Moisture Content (%)	D_{10} (mm)	Reference Specification	
2012.6	4	0.372		



Cobb.	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

Sieve. No.	Diam. (mm)	Cum. Wt. Ret. (g)	% Ret. by Wt.	% Passing by Wt.	% Specs. Pass. by Wt.	
					Min	Max
3	76.1		0.0	100.0		
2.5	64		0.0	100.0		
2	50.8		0.0	100.0		
1.5	38.1		0.0	100.0		
1	25.4	218.6	10.9	89.1		
3/4	19	381.4	18.9	81.1		
3/8	9.51	811.9	40.3	59.7		
#4	4.76	1091.6	54.2	45.8		
#8	2.38	1309.9	65.1	34.9		
#10	2	1363.9	67.8	32.2		
#20	0.85	1597.6	79.4	20.6		
#40	0.42	1785.8	88.7	11.3		
#60	0.25	1897.1	94.3	5.7		
#100	0.149	1937.2	96.3	3.7		
#200	0.074	1954.8	97.1	2.9		

LIQUEFACTION ANALYSIS

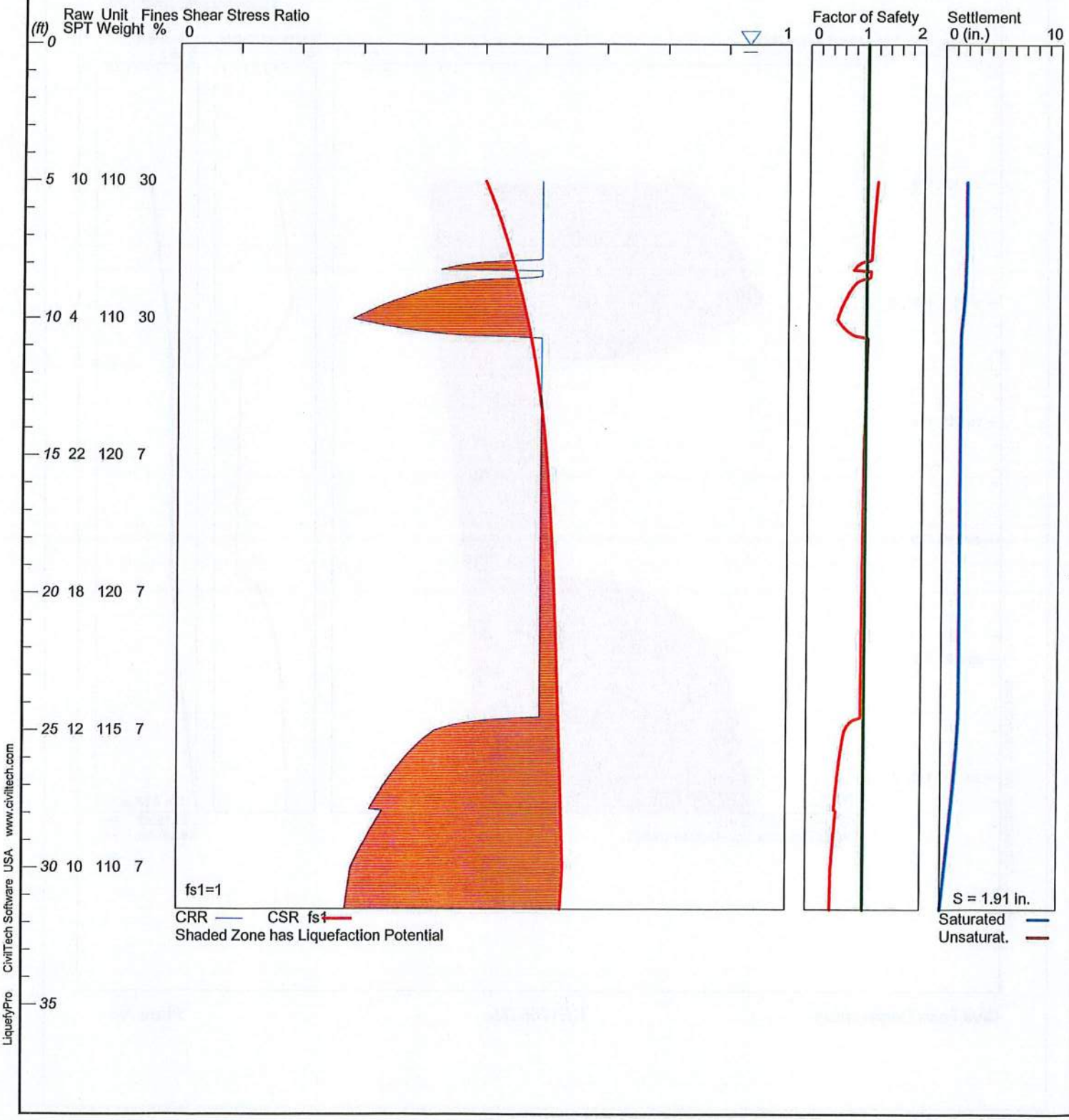
Burnstead Multi-Family

Hole No.=EB-1W Water Depth=0 ft Surface Elev.=155

Magnitude=7

Ground Improvement of Fill=4 ft

Acceleration=0.55g

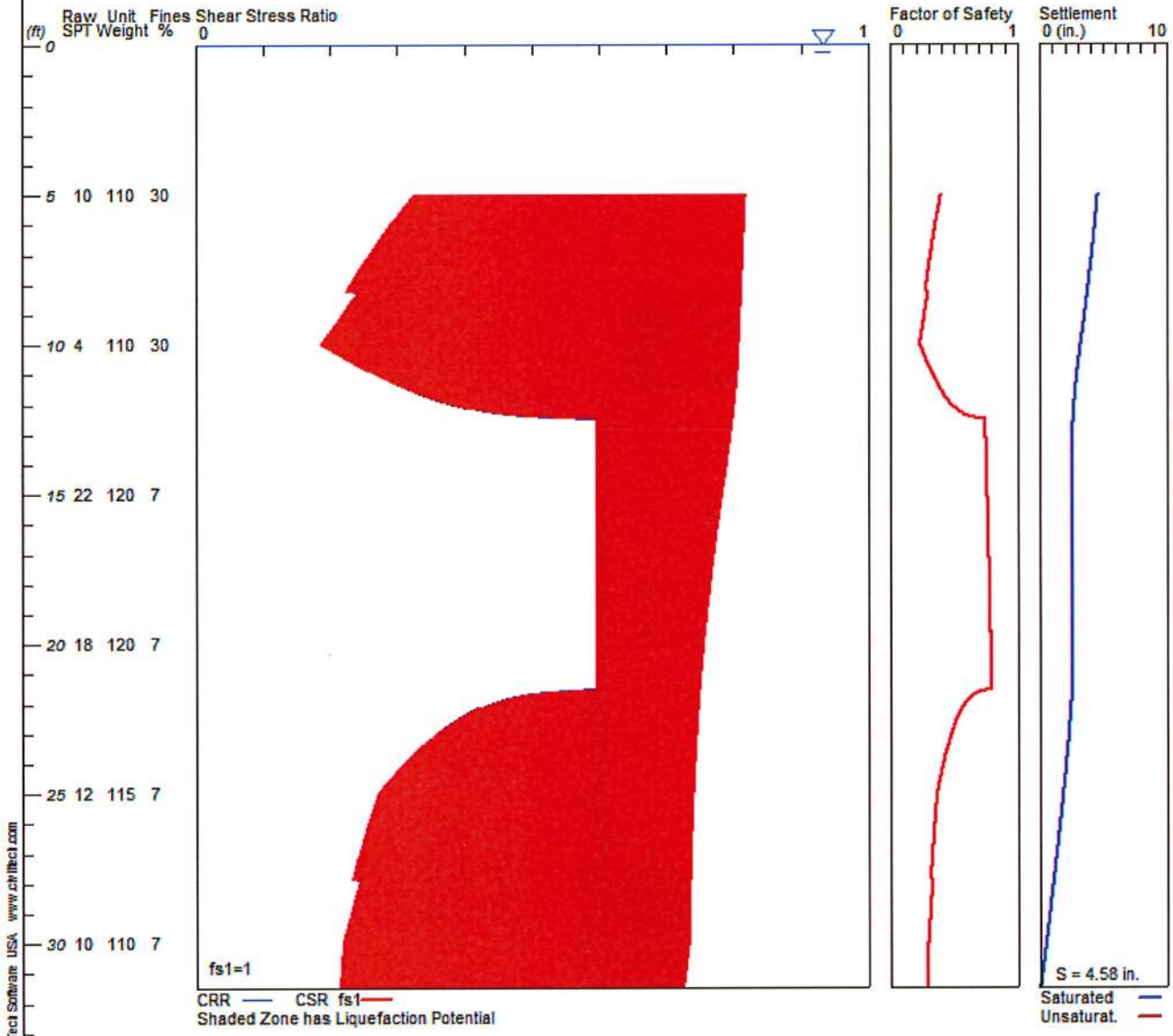


LIQUEFACTION ANALYSIS

Burnstead Multi-Family

Hole No.=EB-1W Water Depth=0 ft Surface Elev.=155

Magnitude=7
Acceleration=0.55g



LIQUEFACTION ANALYSIS

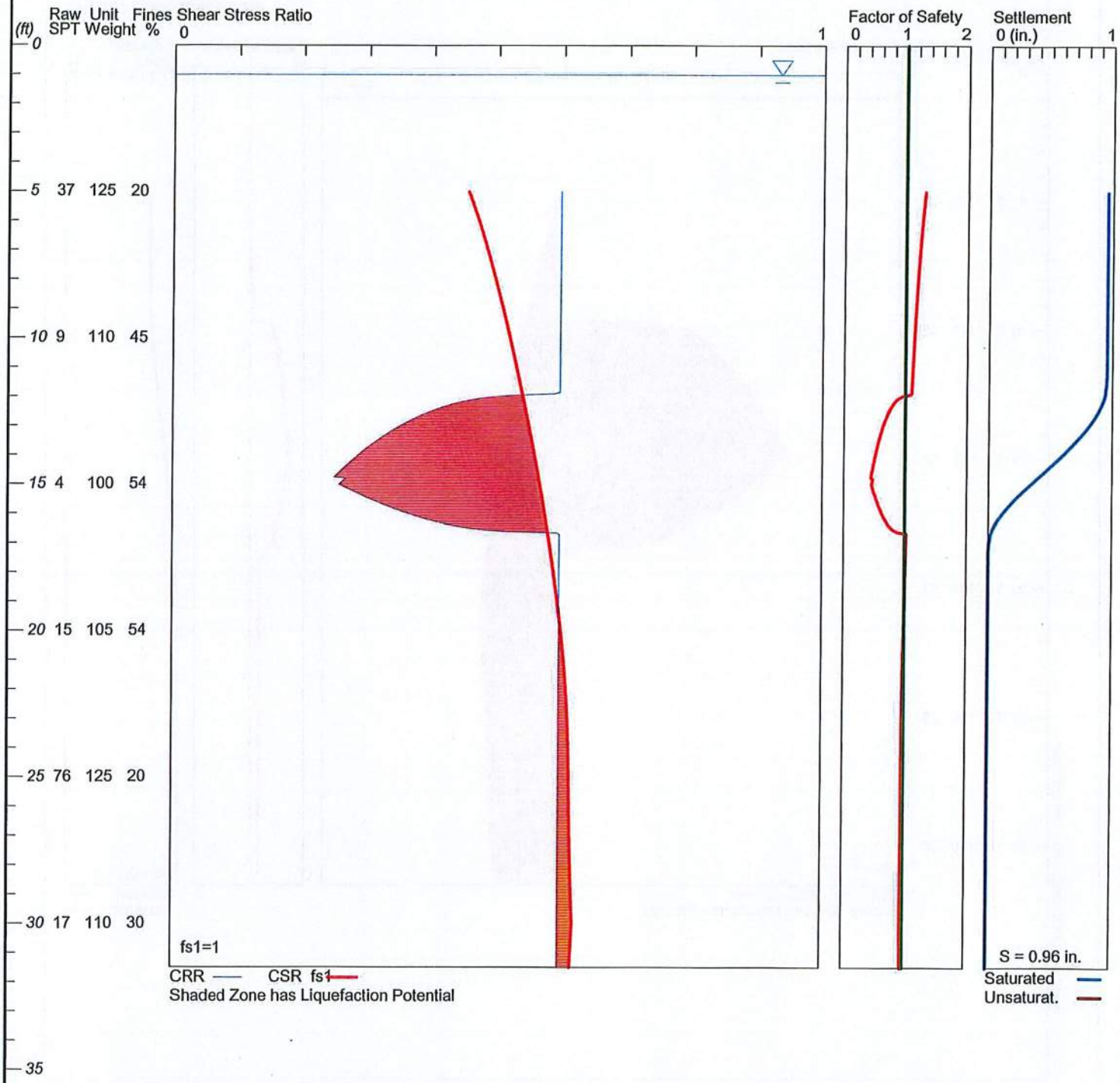
Burnstead Multi-Family

Hole No.=EB-2 Water Depth=1 ft Surface Elev.=170

Ground Improvement of Fill=4 ft

Magnitude=7

Acceleration=0.55g



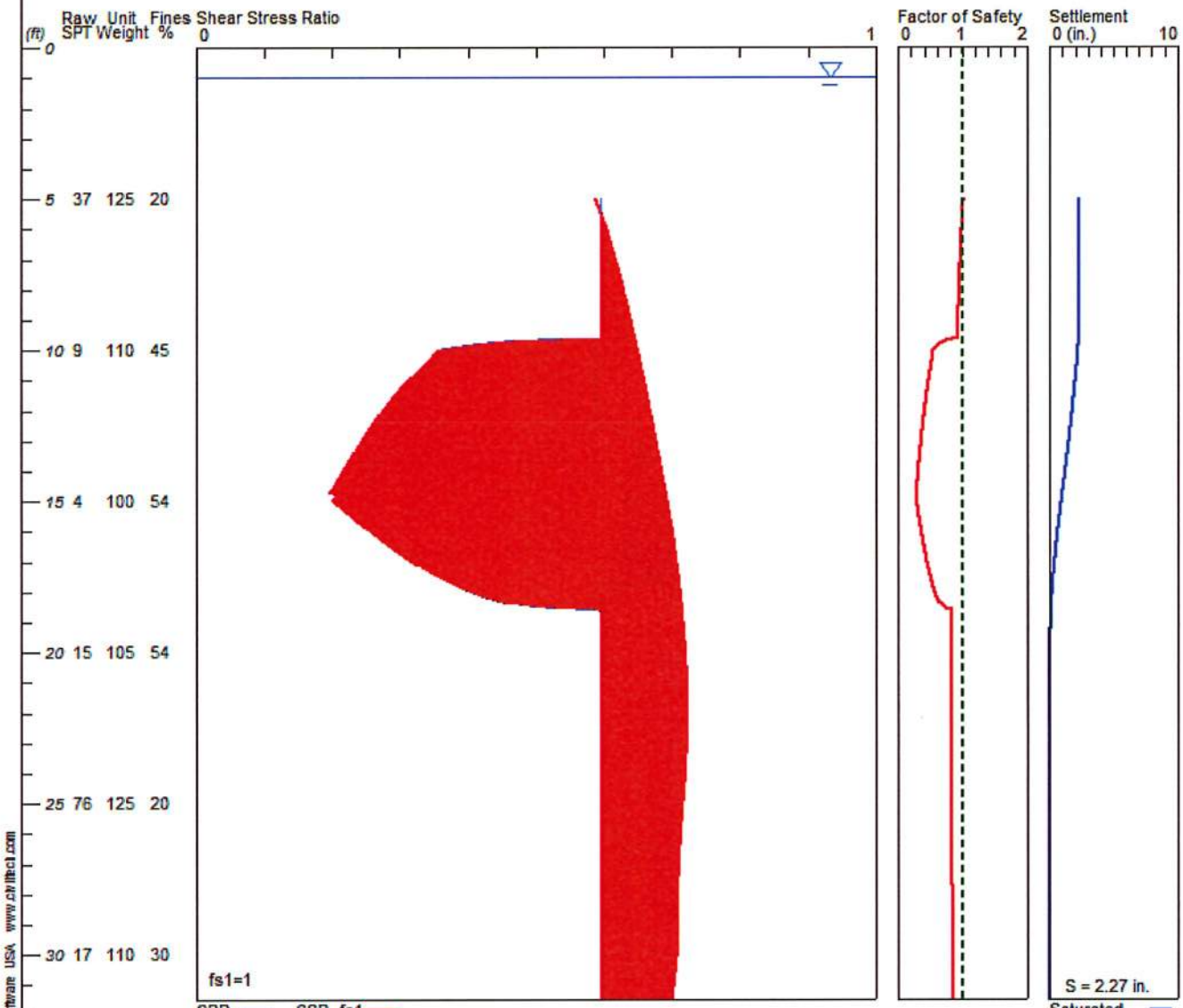
LiquefyPro CivilTech Software USA www.civiltech.com

LIQUEFACTION ANALYSIS

Burnstead Multi-Family

Hole No.=EB-2 Water Depth=1 ft Surface Elev.=170

Magnitude=7
Acceleration=0.55g



PRELIMINARY

TECHNICAL INFORMATION REPORT

FOR

TIBBETT'S CROSSING

CITY OF ISSAQUAH IN KING COUNTY, WASHINGTON

Project Manager: Sheri Murata, P.E.
Prepared by: Daniel J. Larson, E.I.T.
First Submittal:
Revised:
Core No.: 17127

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Tibbett's Crossing

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Appendix A – Parcel & Basin Information

King County Parcel Report

Figure 2-2 Stormwater Drainage Sub-basins in Issaquah

Appendix B – Resource Review & Off-site Analysis Documentation

Critical Aquifer Recharge Area Classification Map

FEMA Map (53033C0693G)

USDA NRCS Site Soils Report

Drainage Complaints Exhibit

Appendix C – Vault Sizing

West Vault Summary

East Vault Summary

Peaks Performance Plot

Durations Performance Plot

1 PROJECT OVERVIEW

The project site is located at 7932 Renton-Issaquah Road SE in the City of Issaquah, King County. Specifically, the project is located partially in the southeast quarter of Section 29, Township 24 North, Range 6 East, W.M. and partially in the northeast quarter of Section 32, Township 24 North, Range 6 East, W.M. The site is bordered by single-family residences and a nursery to the north, a parcel owned by King County to the east and additional single-family residences to the east and south. The west property line is bordered by Renton-Issaquah Road SE and a single-family residence on the south half of the site. The King County tax parcel ID number is shown in Table 1 below (refer to the King County Parcel Reports included in Appendix A).

Table 1: Parcel Information		
KC Parcel #	**Parcel Area (SF)**	**Parcel Area (ac)**
2924069041	955,902	21.9

The total parcel area is approximately 21.9 acres in size and forested on the east half of the site with a single-family residence and lawn covering the west half of the site. Tibbett's Creek occupies the west property line for approximately 300 feet, before continuing north through the center of the site. The project area drains towards the center of the site where Tibbett's Creek collects the runoff and flows north, exiting the site near the center of the north property line. The entire project site is tributary to Tibbett's Creek, eventually discharging into Lake Sammamish. Minimal upstream drainage will flow on to the site from the single-family residence east of the project site.

The proposed development includes 20 lots, two detention vaults, dispersion and infiltration BMPs, buffer averaging and the associated roads and utilities. BMP design is described in detail in Section 4 of this report. Critical areas include wetlands, steep slopes and Tibbett's Creek. See *Figure 1-1: Vicinity Map*, provided below.

The project will be designed using the guidelines and requirements established in the 2009 King County Surface Water Design Manual (2009 KCSWDM) and City of Issaquah Addendum criteria. The project will be adding more than 5,000 square feet of new impervious area so it is required to apply Conservation Flow Control (Level 2) and Sensitive Lake Water Quality.

The detention vaults have been modeled using the King County Runoff Time Series (KCRTS) software.

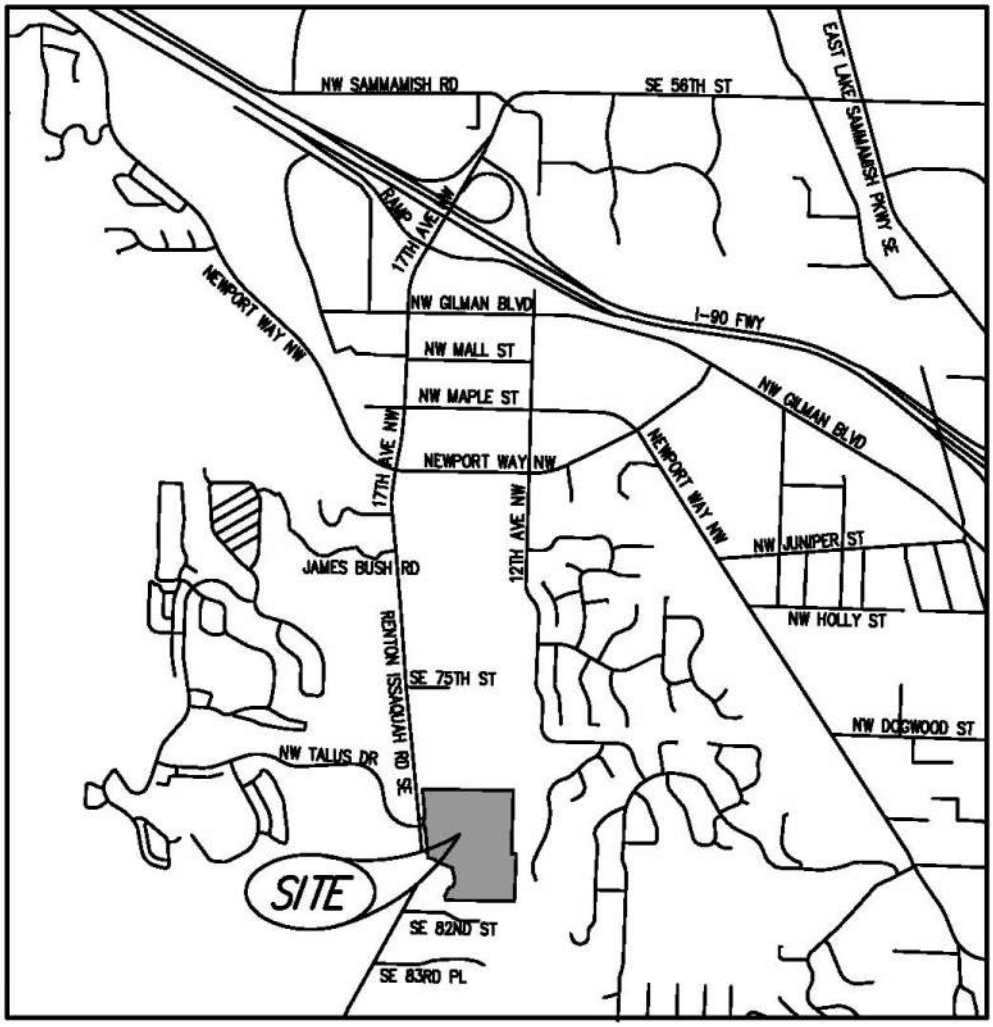


Figure 1-1: Vicinity Map

2 CONDITIONS AND REQUIREMENTS SUMMARY

The proposed project is classified as requiring "Full Drainage Review" per the 2009 KCSWDM. Therefore, all eight core requirements and five special requirements will be addressed per Section 1.1 of the 2009 KCSWDM.

2.1 Core Requirements

2.1.1 Core Requirement #1: Discharge at the Natural Location

This project will match the natural discharge point of Tibbett's Creek at the north property line.

2.1.2 Core Requirement #2: Offsite Analysis

An offsite analysis has been completed for the project site. This core requirement is addressed in Section 3 of this report.

2.1.3 Core Requirement #3: Flow Control

The detention vaults are designed for Conservation Flow Control (Level 2). This requires that the developed condition discharge durations match the existing condition durations from 50% of the 2-year to the 50-year storm events and that the developed 2-year and 10-year peak discharge rates do not exceed the existing 2-year and 10-year peak discharge rates, respectively.

2.1.4 Core Requirement #4: Conveyance System

Conveyance and backwater analysis calculations will be completed during final engineering. The proposed conveyance system will provide sufficient capacity for the 25-year storm as calculated by the Rational Method.

2.1.5 Core Requirements #5: Erosion and Sediment Control

Erosion and sediment control design will be provided during the Site Work Permit.

2.1.6 Core Requirement #6: Maintenance and Operations

The detention vaults and stormwater BMPs will be privately maintained.

2.1.7 Core Requirement #7: Financial Guarantees and Liability

A bond quantities worksheet will be provided in Section 9 of this Report during final engineering.

2.1.8 Core Requirement #8: Water Quality

Lake Sammamish is listed as a Sensitive Lake, therefore the project is subject to the Sensitive Lake Protection menu for water quality. Water quality design is discussed in Section 4 of this report.

2.2 Special Requirement #1: Other Adopted Area-Specific Requirements

2.2.1 Critical Drainage Areas

Per the City's Critical Aquifer Recharge Areas map (included in Appendix B) the site is not located within a Critical Aquifer Recharge Area.

2.2.2 Master Drainage Plan

Not applicable.

2.2.3 Basin Plans

The project site is located within the Issaquah Creek Basin Plan. The entire site is tributary to the Tibbett's Creek Subbasin, which drains to Lake Sammamish.

2.2.4 Salmon Conservation Plans (SCPs)

Not applicable.

2.2.5 Stormwater Compliance Plans (SWCPs)

Not applicable.

2.2.6 Lake Management Plans (LMPs)

Not applicable.

2.2.7 Flood Hazard Reduction Plan Updates (FHRPs)

A Flood Hazard Reduction Plan is not applicable to the project site.

2.2.8 Shared Facility Drainage Plans (SFDPs)

Not applicable.

2.3 Special Requirement #2: Floodplain / Floodway Delineation

Tibbett's Creek, containing a 100-year floodplain, crosses through the project site (see FEMA Map included in Appendix B). The floodplain will be delineated on the engineering plans.

2.4 Special Requirement #3: Flood Protection Facilities

The project site contains a 100-year floodplain, however the floodplain lies outside the areas proposed for development. Refer to the FEMA Map included in Appendix B.

2.5 Special Requirement #4: Source Controls

This project does not require a commercial building or commercial site development permit so source controls do not apply.

2.6 Special Requirement #5: Oil Control

This project is not considered a high use site so oil control does not apply.

3 OFFSITE ANALYSIS

TASK 1 Study Area Definition and Maps

The proposed project contains parcel number 2924069041.

TASK 2 Resource Review

Basin Reconnaissance Summary Reports

No Basin Reconnaissance Summary Reports appear to be available for the area that is within one mile of this project site.

FEMA Maps

A FEMA map dated April 19, 2005 number 53033C0693G was reviewed. Tibbett's Creek, containing a 100 year floodplain, crosses through the project site. The FEMA Map is included in Appendix B.

Sensitive Areas Folio

The project site has steep slopes, a creek and wetlands on site.

USDA Natural Resources Conservation Service Soil Survey

The USDA Natural Resources Conservation Service (NRCS) Web Soil Survey covers the project site area and states that the area of interest comprises of mainly of Kitsap Silt Loam, with smaller areas of Everett very gravelly sandy loam and mixed alluvial sand. The Soils Map exhibit is included in Appendix B.

Downstream Drainage Complaints

Drainage complaints were researched within 1 mile downstream of the study area. King County lists three complaints located within a one-mile radius downstream of the project site. According to the 2009 KCSWDM, drainage complaints that are over 10 years old are not required for a level 1 downstream analysis. All three complaints were made over 10 years ago, therefore a review of these complaints is not required.

There are no current documented downstream problems associated with this project site. See *Drainage Complaint Exhibit* in Appendix B.

TASK 3 Field Investigation

Upstream Tributary Area

A negligible amount of upstream drainage enters the site from the single family residences immediately east of the property. Any upstream drainage is tributary to Tibbett's creek running through the center of the site and exiting the site at the north property line

Level 1 Downstream Analysis

The field investigation was completed on September 6, 2018. The weather was sunny and the temperature was approximately 75 degrees. See Downstream Drainage Exhibit at the end of this section.

The site currently consists of several dilapidated wood structures and an abandoned single family house. Area west of Tibbetts Creek in covered in pasture with clusters of trees scattered throughout, sloping east towards Tibbets Creek. The area surrounding the creek is forested and with overgrown blackberry bushes. Area on site east of Tibbetts Creek is entirely forested, sloping to the west with slopes up to 25%. A wetland exists at the northwest corner of the site.

Runoff on site currently sheet flows towards the center of the site, where Tibbetts Creek flows from the south property line to the north property line and exits the property, continuing north. All area on site is tributary to Tibbetts Creek. Runoff exits the site at the north property line where it continues in a northerly direction for approximately 500 feet before entering a bridge culvert about 6 feet wide and travels under a driveway on the property to the north. The creek then continues north through several single family properties before reaching a point ¼ mile downstream, where the analysis is terminated.

The condition of Tibbetts Creek was evaluated at several points along the downstream path. The creek ranges from 5-8 feet in width on average and up to 6 inches in depth, with no signs of erosion or significant sedimentation observed. The downstream system appears, in general, to be stable.

The following pages show photos of the downstream path. See Figure 3-1 Downstream Drainage Exhibit following this analysis for location of photos and location of points referenced in the report.

1 – On site looking south, upstream Tibbett's Creek.

2 – Tibbett's Creek on site looking north.

3 – Location 2 on map. Downstream of site looking south.

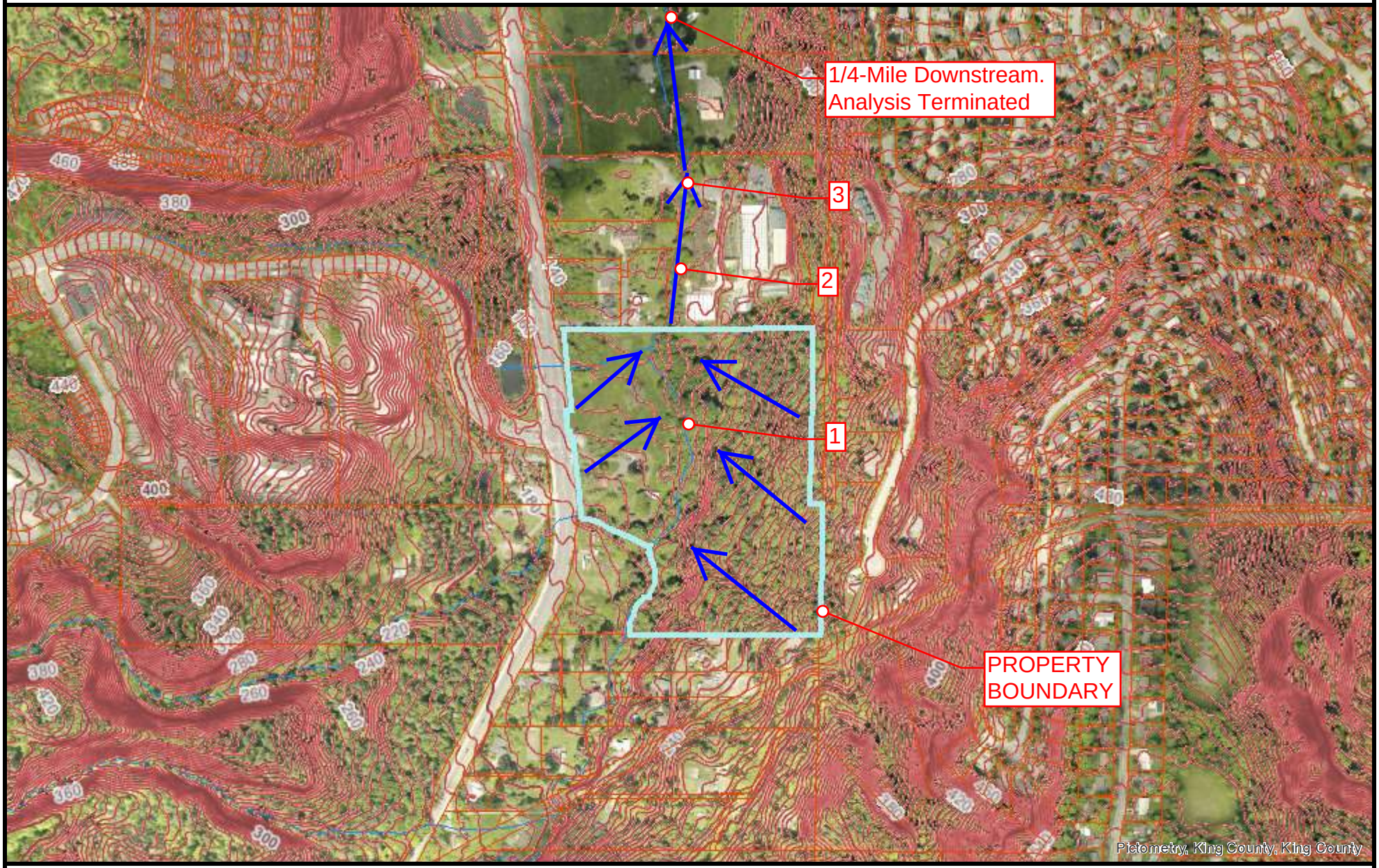
4 – Location 2. 300 feet downstream of site looking north.

5 – Location 3 looking north of downstream culvert.

6 – Location 3 looking south of downstream culvert.

7 – Looking south though downstream culvert, approximately 500 feet downstream of site to north.

King County iMap



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Date: 9/4/2018 Notes:

N

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TASK 4 Drainage System Description and Problem Description

A description of the existing drainage system has been included in the downstream analysis and all drainage system components can be seen in Figure 3-1: Downstream Drainage Exhibit.

TASK 5 Mitigation of Existing and Potential Problems

Downstream Drainage Problems Requiring Special Attention

Type 1 – Conveyance System Nuisance Problems

There are no known, reported or observed current downstream conveyance nuisance problems.

Type 2 – Severe Erosion Problems

There are no known, reported or observed current downstream severe erosion problems

Type 3-Severe Flooding Problems

There are no known, reported or observed current downstream severe flooding problems.

Downstream Water Quality Problems Requiring Special Attention

The City of Issaquah Surface Water Design Manual Addendum, the current (2012) EPA approved Water Quality Assessment (303d) list for Washington State and the 2009 KCSWDM Reference 10, King County-Identified Water Quality Problems were reviewed for each of the seven downstream water quality problem types to a distance of one mile downstream of the project site. The following discussion includes reference to the updated (2012) 303(d) list of impaired water bodies.

Type 1 – Bacteria Problems
There are no known or reported downstream bacteria problems.

Type 2 – Dissolved Oxygen (DO) Problems

Tibbett's Creek is listed as a Category 5 on the impaired water body list for dissolved oxygen.

Figure 3-3: Current Water Quality Conditions (Dissolved Oxygen Levels)

Listing ID: 15778	
Main Listing Information	
Listing ID: 15778	**2014 Category:** 5
Waterbody Name: TIBBETTS CREEK	**2012 Category:** 5
Medium: Water	**2008 Category:** 5
Parameter: Dissolved Oxygen	**2004 Category:** 5
WQI Project: None Assigned	**On 1998 303(d) List?:** N
Designated Use: None Assigned	**On 1996 303(d) List?:** N
Assessment Unit	
Assessment Unit ID: 17110012000224	
Location Identification	
Counties: King	**WRIA:** 8 - Cedar-Sammamish
Waterbody ID (WBID): WA-08-1115	**Waterbody Class:** RAA
Town/Range/Section (Legacy): 24N-6E-29	
Basis	
King County unpublished data from station A630 (Tibbetts Creek RM 1.0) show the criterion was exceeded in 1987, 1988, 1989, and 1990.	
Remarks	
No Remarks Entered	
EIM	
No EIM Records Entered	

Type 3 – Temperature Problems

Tibbett's Creek is listed as a Category 5 on the impaired water body list for temperature.

Figure 3-4: Current Water Quality Conditions (Temperature Levels)

Listing ID: 15781	
Main Listing Information	
Listing ID: 15781	**2014 Category:** 5
Waterbody Name: TIBBETTS CREEK	**2012 Category:** 5
Medium: Water	**2008 Category:** 5
Parameter: Temperature	**2004 Category:** 5
WQI Project: None Assigned	**On 1998 303(d) List?:** N
Designated Use: None Assigned	**On 1996 303(d) List?:** Y
Assessment Unit	
Assessment Unit ID: 17110012000224	
Location Identification	
Counties: King	**WRIA:** 8 - Cedar-Sammamish
Waterbody ID (WBID): WA-08-1115	**Waterbody Class:** RAA
Town/Range/Section (Legacy): 24N-6E-29	
Basis	
U.S.Geological Survey data from NWIS database station 12121699 (Tibbetts Cr at SE Newport Way nr Issaquah) shows 1 excursions beyond the criterion out of 1 samples collected between 01/93 - 10/00. King County unpublished data from station A630 (Tibbetts Creek RM 1.0) show the criterion was exceeded in 1987, 1988, 1989, and 1990.between 1/91 and 4/97.	
Remarks	
No Remarks Entered	
EIM	
No EIM Records Entered	

Type 4 – Metals Problems

There are no known or reported downstream metals problems.

Type 5 – Phosphorous Problems

There are no known or reported downstream phosphorous problems.

Type 6 – Turbidity Problems

There are no known or reported downstream turbidity problems.

Type 7 – High pH Problems

There are no known or reported downstream turbidity problems.

Other

Tibbett's Creek is listed as a Category 5 for bioassessment.

Listing ID: 70112

Main Listing Information

Listing ID:	70112	**2014 Category:**	5
Waterbody Name:	TIBBETTS CREEK	**2012 Category:**	3
Medium:	Other	**2008 Category:**	3
Parameter:	Bioassessment	**2004 Category:**	3
WQI Project:	None Assigned	**On 1998 303(d) List?:**	N
Designated Use:	None Assigned	**On 1996 303(d) List?:**	N

Assessment Unit

Assessment Unit ID: 17110012000224

Location Identification

Counties: King **WRIA:** 8 - Cedar-Sammamish
Waterbody ID (WBID): None Assigned **Waterbody Class:** None Assigned
Town/Range/Section (Legacy): 24N-6E-20

Basis

Location ID [08LAK3616] was sampled by King County - the Benthic Index of Biotic Integrity (B-IBI) score was 26 in 2006, 20 in 2007, 20 in 2008, 18 in 2010;
Location ID [08LAK3699] was sampled by King County - the Benthic Index of Biotic Integrity (B-IBI) score was 26 in 2006, 20 in 2007, 16 in 2008, 18 in 2009, 30 in 2010

Remarks

Remark	Modified By	Modified On	Visibility
The source of the benthic macroinvertebrate community data and associated B-IBI scores is the Puget Sound Stream Benthos database, which is maintained by King County.	Patrick Lizon	12/22/2015	Private
The listing has been reassessed under the current Policy 1-11 and has been moved from Category 3 to Category 5 based on new data.	Curtis Cooper	8/13/2015	Private
The listing has been placed in Category 5 because the two most recent data points indicate that biological integrity is degraded or because two or more B-IBI/RIVPACS data points in the most recent five data points indicate biological degradation and the scores do not qualify for Category 1 or Category 2. A B-IBI score ≤ 27 and a RIVPACS score less than 0.73 indicates degraded biological integrity. A data point is the lowest bioassessment score observed for a given year.	Curtis Cooper	8/13/2015	Public

EIM

No EIM Records Entered

Drainage Adjustments

There is no drainage adjustment proposed for this project.

4 FLOW CONTROL AND WATER QUALITY DESIGN

4.1 Existing Site Hydrology

The total site area for the plat including the critical areas is 21.94 acres, however the total developable area is 16.47 acres. The existing parcel is forested on the east half, with a single family residence, grass, and scattered trees on the west half. The site contains slopes up to 25% on the east half and average slopes of 5-10% on the west half. The entire site slopes towards the center where Tibbett's Creek exists and is flowing to the north, exiting the site at the north property line. A wetland also exists near the center of the site associated with Tibbett's Creek, with an additional wetland at the northwest corner of the project site. A geotechnical investigation of the project site has been completed by Associated Earth Sciences, Inc. and is included in Appendix B of this report.

As stated above, the entire site slopes towards the center, thus the entire site area is tributary to Tibbett's Creek. The site has been delineated further into two subbasins, one for the area west of Tibbett's Creek, and one subbasin for the area east of Tibbett's Creek.

See Table 4-1 below and *Figure 4-1: Existing Conditions* provided in the following pages of this section. Existing site conditions (forested) are assumed for all predeveloped areas. The predeveloped areas were determined based on historic conditions of the site including existing impervious are and are excluding all critical areas and area not affected by development. This assumption is based on Section 1.1.3 of the Issaquah Surface Water Design Manual Addendum which says projects proposing more than 5,000 sf of new impervious surface shall assume historic conditions except for existing impervious surfaces for the pre-developed condition. Area shown for the east basin is tributary to the east vault while area shown for the west basin is tributary to the west vault.

Table 4-1 Predeveloped Areas			
GROUND COVER	**EAST AREA (acres)**	**WEST AREA (acres)**	**TOTAL (acres)**
Till-Forest	0.32	2.34	2.66
Impervious	0.00	0.32	0.32
TOTAL	**0.32**	**2.66**	**2.98**

The peak flow rates for the pre-developed conditions of each basin as determined by KCRTS (one hour time steps) are shown below. A regional scale factor of LA 1.1 was used as determined by Figure 3.2.2.A.

```
          Flow Frequency Analysis
  Time Series File:predev_east.tsf
  Project Location:Landsburg

  ---Annual Peak Flow Rates---      -----Flow Frequency Analysis-------
 Flow Rate  Rank  Time of Peak       - - Peaks - -  Rank  Return  Prob
   (CFS)                               (CFS)             Period
   0.032      2   2/09/01 18:00        0.038         1  100.00   0.990
   0.005      7   1/05/02 16:00        0.032         2   25.00   0.960
   0.021      4   2/28/03 16:00        0.027         3   10.00   0.900
   0.004      8   3/03/04  5:00        0.021         4    5.00   0.800
   0.019      5   1/05/05 10:00        0.019         5    3.00   0.667
   0.015      6   1/18/06 21:00        0.015         6    2.00   0.500
   0.027      3  11/24/06  5:00        0.005         7    1.30   0.231
   0.038      1   1/09/08  7:00        0.004         8    1.10   0.091
Computed Peaks                         0.036             50.00   0.980
```

```
          Flow Frequency Analysis
  Time Series File:predev_west.tsf
  Project Location:Landsburg

  ---Annual Peak Flow Rates---      -----Flow Frequency Analysis-------
 Flow Rate  Rank  Time of Peak       - - Peaks - -  Rank  Return  Prob
   (CFS)                               (CFS)             Period
   0.269      2   2/09/01 18:00        0.319         1  100.00   0.990
   0.044      7   1/05/02 16:00        0.269         2   25.00   0.960
   0.172      4   2/28/03 16:00        0.219         3   10.00   0.900
   0.031      8   3/03/04  2:00        0.172         4    5.00   0.800
   0.157      5   1/05/05 10:00        0.157         5    3.00   0.667
   0.126      6   1/18/06 21:00        0.126         6    2.00   0.500
   0.219      3  11/24/06  5:00        0.044         7    1.30   0.231
   0.319      1   1/09/08  7:00        0.031         8    1.10   0.091
Computed Peaks                         0.303             50.00   0.980
```

4.2 Developed Site Hydrology

This project includes 20 lots with associated roads and utilities, and two combined detention and water quality vaults. As previously stated, the project site has been delineated into two subbasins, one for the developed area west of Tibbett's Creek and another for developed area east of the creek. A detention vault will collect and treat stormwater for each subbasin in order to meet flow control and water quality requirements. The detention vault for the east basin will be located under the roadway on the east side of the bridge that spans Tibbett's Creek. Stormwater runoff from the roadway east of the creek and some roadway from the west side of the creek will be tributary to this vault. Runoff from Lots 1-16 and the rest of the roadway will be tributary to the west vault located north of Lot 14. Each detention vault will then discharge into Tibbett's Creek, preserving the natural discharge location of the site.

When modeling the detention vaults, only areas tributary to the detention facilities will be accounted for, including all impervious areas and landscaping. Critical areas such as Tibbett's Creek, wetlands, and all associated buffers are not included in the areas used for sizing the detention facilities. Lots 17-20 have been mitigated for flow control using full infiltration and full dispersion BMPs and have therefore been excluded from the areas used for modeling. In addition, 0.04 acres of roadway directly above Tibbett's Creek will be modeled as bypass as it cannot be directed to a flow control facility. The areas input to KCRTS for modeling of the detention facilities are summarized in Table 4-2 below. These areas also include modeling credits earned from the use of Flow Control BMPs. Design of the flow control BMPs and the applicable credits are discussed further in Section 4.4 of this report.

Table 4-2 Developed Condition Areas

GROUND COVER	EAST AREA (acres)	WEST AREA (acres)	TOTAL (acres)
Till-Forest	0.00	0.56	0.56
Till-Grass	0.01	0.37	0.38
Outwash- Forest	0.00	0.04	0.04
Outwash- Grass	0.00	1.02	1.02
Effective Impervious	0.27	0.67	0.94
Bypass (Impervious)	0.04	0.00	0.04
TOTAL DEVELOPED AREA	**0.32**	**2.66**	**2.98**

4.3 Performance Standards

All stormwater facilities will be designed in accordance with the 2009 KCSWDM with the City of Issaquah Surface Water Design Manual Addendum, Attachment B, dated October 31, 2011, with Conservation Flow Control Standards. The proposed water quality treatment system will meet requirements from the Sensitive Lake Water Quality Protection Menu.

Flow Control: Conservation Flow Control Standard
The Conservation Flow Control Standard requires maintaining the durations of high flows at their pre-development levels for all flows greater than one-half of the 2-year peak flow through the 50-year peak flow. The pre-development peak flow rates for the 2-year and 10-year runoff events must also be maintained under this requirement.

Conveyance Capacity:
The proposed conveyance system will be designed with sufficient capacity to convey and contain the 25-year peak flow as determined by the Rational Method. It will also be verified that the 100-year peak flow will not create or aggravate a severe flooding or erosion problem per Section 1.2.2.

Water Quality: Sensitive Lake Water Quality Menu

The Sensitive Lake Protection Water Quality Menu includes two pollutant removal targets and includes the control of phosphorous as follows:

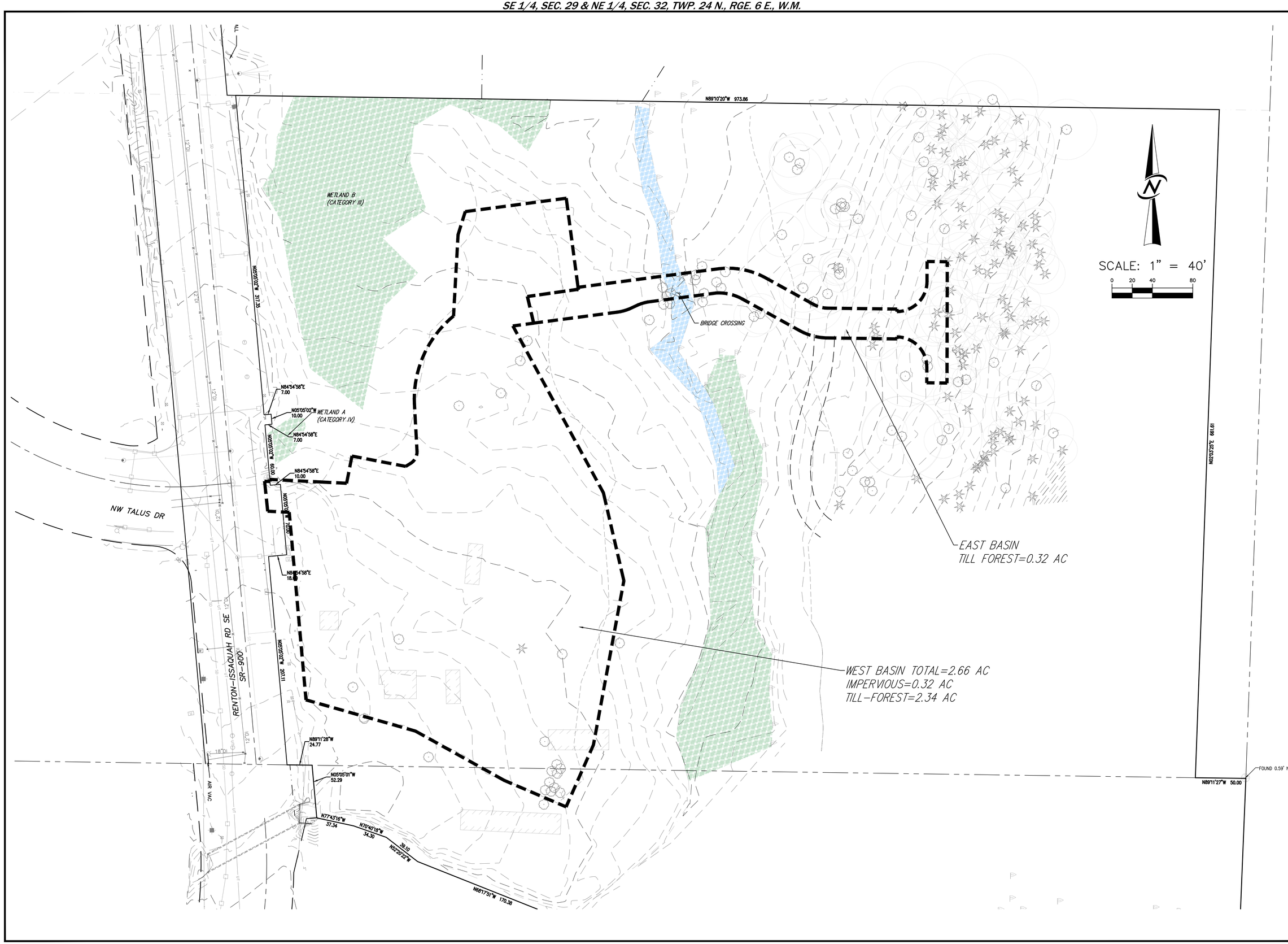
- Total Suspended Solids (TSS) = 80% reduction
- Total Phosphorus = 50% reduction

The Sensitive Lake Protection Menu, described in detail in Section 6.1.3 provides four options to meet the pollutant removal targets listed above.

- Option 1: Large Wetpond
- Option 2: Large Sand Filter
- Option 3: Two-Facility Treatment Train
- Option 4: Basic Menu Plus Phosphorous Credit

The project elects to utilize Lake Protection Option 4, which allows the project to use the Basic water quality menu while earning credit for proposing a land use action that reduces phosphorus in stormwater runoff. The project will comply with credit-earning action #1, which requires the project to leave at least 65% of the site undisturbed, including undevelopable land. The project proposes to develop 4.44 acres of the 21.94 acre site, leaving 80% of the site undeveloped and earning the phosphorus credit for option 4. Therefore, the project is subject to the basic water quality menu. The project will implement basic water quality option 4: Wetvault, utilizing dead storage volume within the detention vaults proposed for flow control.

More detailed discussion and sizing calculations of the flow control and water quality treatment facility proposed for this project follows later in this section.



NO.	REVISIONS	DATE

9-17-18

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Bellevue, Washington 98007
425.885.7877 Fax 425.885.7963

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FIGURE 4-1: EXISTING CONDITIONS TIBBETTS CROSSING

STEVE BURNSTEAD CONSTRUCTION, LLC

11980 NE 24TH STREET SUITE 200
BELLEVUE, WA 98005

DATE	AUGUST 2018
DESIGNED	SHERI H. MURATA, P.E.
DRAWN	DAVID S. VAUGHN
APPROVED	SHERI H. MURATA, P.E. PROJECT MANAGER

SHEET	OF
C4.00	13

PROJECT NUMBER
17127

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4.4 Flow Control System

Calculation of Impervious Area

The minimum impervious area per lot per the 2009 KCSWDM (page 3-27) would either be 4,000 square feet per lot or the maximum impervious area per zoning, whichever is less. The project has estimated 50% impervious coverage as the maximum allowed for each lot based on zoning.

Flow Control BMPs/Individual Lot BMPs

This project proposes to implement various flow control BMPs to reduce runoff volumes and decrease the size of the detention facilities through credits as allowed in Section 5.2.2 of the 2009 KCSWDM. The project contains lots that are under 22,000 square feet, therefore the project is subject to the small lot BMP requirements listed in Section 5.2.1.1 of the 2009 KCSWDM. The requirements and responses for each are listed below.

1. The feasibility and applicability of full dispersion as detailed in Appendix C, Section C.2.1 must be evaluated for the roof area (or an impervious area of equivalent size) on the site/lot. If feasible and applicable, full dispersion of roof runoff must be implemented as part of the proposed project. Typically, small lot full dispersion will be applicable only in subdivisions where enough forest was preserved by tract, easement or covenant to meet the minimum requirements for full dispersion in Appendix C, Section C.2.1.1. If this first requirement is met for the site/lot, no other flow control BMPs are required, and the remaining requirements below are optional.

Response: *The project proposes to implement full dispersion on lots where the flow path can be supported. A total of 33,298 square feet of impervious roof area will be mitigated using full dispersion. By implementing full dispersion, the project is able to model all fully dispersed surfaces as forest when sizing the detention facilities. This credit has been accounted for in tables 4-2 and 4-3 above.*

2. Where full dispersion of roof runoff (or equivalent) is not feasible or applicable, or will cause flooding or erosion impacts, the feasibility and applicability of full infiltration as detailed in Appendix C, Section C.2.2 must be evaluated for roof runoff (note, this will require a soils report for the site/lot). If feasible and applicable, full infiltration of roof runoff must be implemented as part of the proposed project. If this requirement or the full dispersion requirement above is met for the site/lot, no other flow control BMPs are required, and the remaining requirements below are optional.

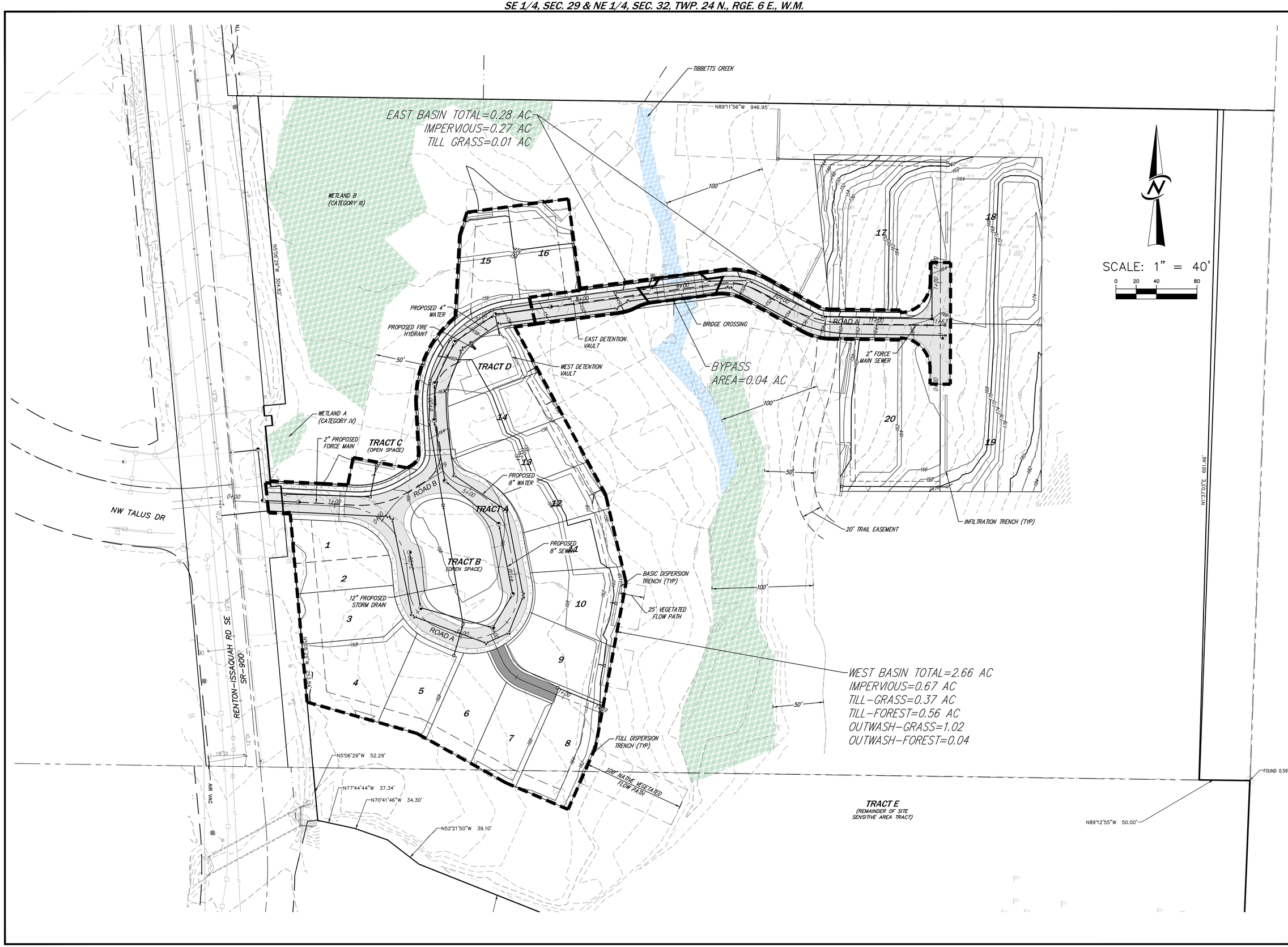
Response: *Full infiltration will be implemented on several of the lots in the east basin where infiltration is feasible and applicable. The project will mitigate a total of 5,000 square feet of impervious roof area using infiltration, allowing the project to remove the mitigated area for modeling of the detention facilities per Table 5.2.2.A of the 2009 KCSWDM.*

3. Where full dispersion or full infiltration of roof runoff as specified in Requirements 1 and 2 above is not feasible or applicable, or will cause flooding or erosion impacts, one or more of the following BMPs must be applied to (or used to mitigate for) an impervious area equal to at least 10% of the site/lot for site/lot sizes up to 11,000 square feet and at least 20% of the site/lot for site/lot sizes between 11,000 and 22,000 square feet. For projects located in critical aquifer recharge areas, these impervious area amounts must be doubled. The BMPs listed below may be located anywhere on the site/lot subject to the limitations and design specifications for each BMP. These BMPs must be implemented as part of the proposed project.

- Limited Infiltration
- **Basic Dispersion**
- Rain Garden
- Permeable Pavement
- Rainwater Harvesting
- Vegetated Roof
- Reduced Impervious Surface Credit
- Native Growth Retention Credit

Response: *The project proposes to implement sheetflow (basic) dispersion for impervious roof area that is not mitigated through full dispersion or full infiltration. A total of 11,564 square feet of impervious roof area will be mitigated using sheetflow dispersion.*

In addition to the BMPs implemented for impervious roof area, the project proposes basic sheetflow dispersion BMPs for the impervious roadway and full dispersion where feasible. A total of 14,981 square feet of impervious road surface will be mitigated using dispersion BMPs. Refer to the Developed Condition Exhibit at the end of this section for locations of all proposed flow control BMPs for the project site.



NO.	REVISIONS	DATE

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FIGURE 4-2: DEVELOPED CONDITIONS TIBBETTS CROSSING

STEVE BURNSTEAD CONSTRUCTION, LLC

11980 NE 24TH STREET SUITE 200
BELLEVUE, WA 98005

DATE	AUGUST 2018
DESIGNED	SHERI H. MURATA, P.E.
DRAWN	DAVID S. VAUGHN
APPROVED	SHERI H. MURATA, P.E. PROJECT MANAGER

SHEET	OF
C4.00	13

PROJECT NUMBER 17127

9-10-18

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Detention Vaults

The West Vault has been sized to receive runoff from the entry road and the entire west basin, after accounting for all flow control BMP facility sizing credits, per Table 5.2.2.A of the 2009 KCSWDM. A flow splitter will be utilized to divert flows that have been designated for full dispersion as discussed in the previous section. The east tank is unable to meet the flow control standard for the east basin, so the west tank will over detain the runoff from the west basin to accommodate. The combined outflow of the east and west detention tanks as well as the 0.04 acres of bypass will meet the level 2 flow control standard for the entire site. The KCRTS summaries for the west and east detention vaults are shown in this section.

West - KCRTS Vault Calculation

```
         Type of Facility: Detention Vault
         Facility Length:       50.00  ft
          Facility Width:       25.00  ft
           Facility Area:     1250.    sq. ft
 Effective Storage Depth:        8.80  ft
       Stage 0 Elevation:        0.00  ft
          Storage Volume:    11000.    cu. ft
              Riser Head:        8.80  ft
          Riser Diameter:       12.00  inches
      Number of orifices:        3
                                     Full Head    Pipe
    Orifice #      Height  Diameter  Discharge  Diameter
                    (ft)     (in)      (CFS)      (in)
       1            0.00      1.38        0.152
       2            3.00      1.00        0.065    4.0
       3            6.50      1.00        0.041    4.0
          Top Notch Weir: None
    Outflow Rating Curve: None
```

The proposed detention vault includes a three orifice control structure. Locations and sizes of the orifices can be seen in the previous KCRTS summary.

East - KCRTS Vault Calculation

```
Type of Facility: Detention Vault
         Facility Length:       45.00  ft
          Facility Width:        5.00  ft
           Facility Area:      225.    sq. ft
 Effective Storage Depth:        4.80  ft
       Stage 0 Elevation:        0.00  ft
          Storage Volume:     1080.    cu. ft
              Riser Head:        4.80  ft
          Riser Diameter:       12.00  inches
      Number of orifices:        2
                                     Full Head    Pipe
    Orifice #      Height  Diameter  Discharge  Diameter
                    (ft)     (in)      (CFS)      (in)
       1            0.00      1.00        0.059
       2            3.50      0.75        0.017    4.0
          Top Notch Weir: None
    Outflow Rating Curve: None
```

Since the point of compliance is downstream of both vaults, the outflow of the East vault was modeled as a tributary time series file to the West vault. Therefore, the outflow at the point of compliance is 0.164 cfs for the 2-year event and 0.273 cfs for the 10-year event as shown in the KCRTS modeling file below. Note that both the 2-year and 10-year release rates are below the target peak flow rates of 0.185 cfs and 0.311 cfs respectively from the output file also shown below.

```
          Flow Frequency Analysis
  Time Series File:dsout_total.tsf
  Project Location:Landsburg

  ---Annual Peak Flow Rates---      -----Flow Frequency Analysis-------
 Flow Rate  Rank  Time of Peak       - - Peaks - -  Rank  Return  Prob
   (CFS)                                (CFS)             Period
   0.303      2   2/09/01 15:00        0.981         1  100.00   0.990
   0.087      8  12/03/01 22:00        0.303         2   25.00   0.960
   0.182      5   2/28/03  8:00        0.273         3   10.00   0.900
   0.116      7   8/23/04 22:00        0.188         4    5.00   0.800
   0.188      4   1/05/05 11:00        0.182         5    3.00   0.667
   0.164      6   1/18/06 22:00        0.164         6    2.00   0.500
   0.273      3  11/24/06  6:00        0.116         7    1.30   0.231
   0.981      1   1/09/08  8:00        0.087         8    1.10   0.091
Computed Peaks                         0.755             50.00   0.980
```

```
          Flow Frequency Analysis
  Time Series File:predev.tsf
  Project Location:Landsburg
```

---Annual Peak Flow Rates---			-----Flow Frequency Analysis-------			
Flow Rate (CFS)	Rank	Time of Peak	- - Peaks - - (CFS)	Rank	Return Period	Prob
0.347	2	2/09/01 15:00	0.509	1	100.00	0.990
0.105	8	1/05/02 16:00	0.347	2	25.00	0.960
0.246	4	2/28/03 16:00	**0.311**	**3**	**10.00**	**0.900**
0.149	7	8/26/04 1:00	0.246	4	5.00	0.800
0.228	5	1/05/05 10:00	0.228	5	3.00	0.667
0.185	6	1/18/06 16:00	**0.185**	**6**	**2.00**	**0.500**
0.311	3	11/24/06 5:00	0.149	7	1.30	0.231
0.509	1	1/09/08 7:00	0.105	8	1.10	0.091
Computed Peaks			0.455		50.00	0.980

The flow duration comparison analysis results for the provided detention vault are shown below and there is no positive excursion.

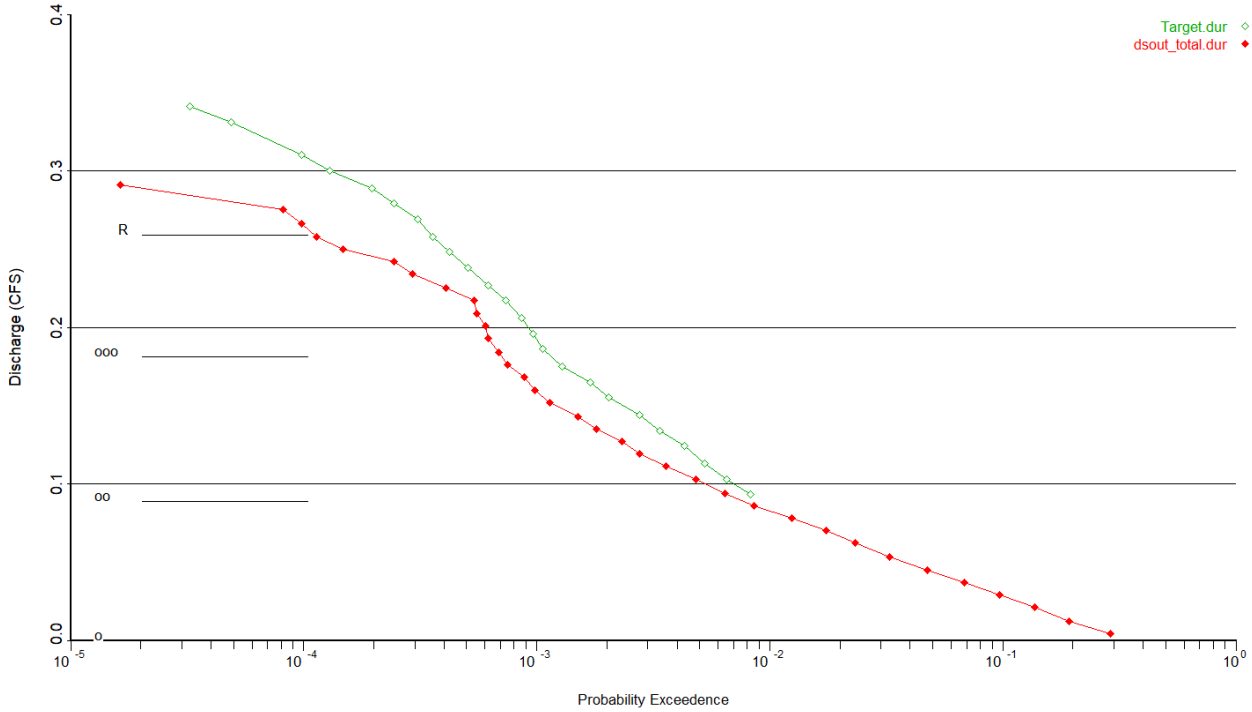
```
Duration Comparison Anaylsis
   Base File: predev.tsf
    New File: dsout_total.tsf
Cutoff Units: Discharge in CFS
```

	-----Fraction of Time-----				---------Check of Tolerance-------			
Cutoff	Base	New	%Change	Probability	Base	New	%Change
0.092	0.83E-02	0.76E-02	-9.0	0.83E-02	0.092	0.090	-3.1
0.112	0.54E-02	0.38E-02	-28.6	0.54E-02	0.112	0.103	-7.9
0.132	0.36E-02	0.23E-02	-35.4	0.36E-02	0.132	0.114	-13.8
0.151	0.22E-02	0.14E-02	-35.8	0.22E-02	0.151	0.134	-11.5
0.171	0.14E-02	0.90E-03	-37.5	0.14E-02	0.171	0.151	-11.5
0.190	0.10E-02	0.64E-03	-38.1	0.10E-02	0.190	0.163	-14.6
0.210	0.80E-03	0.57E-03	-28.6	0.80E-03	0.210	0.179	-14.6
0.230	0.57E-03	0.52E-03	-8.6	0.57E-03	0.230	0.218	-5.1
0.249	0.42E-03	0.34E-03	-19.2	0.42E-03	0.249	0.238	-4.7
0.269	0.31E-03	0.13E-03	-57.9	0.31E-03	0.269	0.258	-4.1
0.288	0.20E-03	0.82E-04	-58.3	0.20E-03	0.288	0.265	-8.1
0.308	0.98E-04	0.00E+00	-100.0	0.98E-04	0.308	0.282	-8.5
0.328	0.49E-04	0.00E+00	-100.0	0.49E-04	0.328	0.291	-11.0
0.347	0.16E-04	0.00E+00	-100.0	0.16E-04	0.347	0.303	-12.7

```
There is no positive excursion

Maximum negative excursion = 0.036 cfs (-17.8%)
occurring at 0.201 cfs on the Base Data:predev.tsf
and at 0.165 cfs on the  New Data:dsout_total.tsf
```

Figure 4-3: Flow Durations Plot



4.5 Water Quality Calculations

Water Quality treatment is required for new and replaced pollution generating impervious surfaces and new pollution generating pervious surfaces (PGIS).

The project is subject to the Sensitive Lake Water Quality standard. The Sensitive Lake Protection Menu, described in detail in Section 6.1.3 provides four options to meet the pollutant removal targets listed above.

- Option 1: Large Wetpond
- Option 2: Large Sand Filter
- Option 3: Two-Facility Treatment Train
- Option 4: Basic Menu Plus Phosphorous Credit

The project elects to utilize Lake Protection Option 4, which allows the project to use the Basic water quality menu while earning credit for proposing a land use action that reduces phosphorus in stormwater runoff. Because the project elects to leave over 65% of the site undeveloped, the project is

able to use the basic water quality menu. Water quality treatment will be accommodated with a combined detention/water quality treatment vault in the form of dead storage.

BASIC WETVAULT - (DEAD STORAGE)

The required dead storage volume needed within the vaults to meet the water quality standard was determined using procedures provided in Section 6.4.1.1 of the 2009 KCSWDM. Areas tabulated below are the subject site's developed areas tributary to the vaults.

$V_B = f\ V_r$

where: f = volume correction factor = 3 (Basic)

V_r = volume of runoff from mean annual storm, CF

$V_r = (0.9A_i + 0.25A_{tg} + 0.10A_{tf} + 0.01A_o) \times R$

where: A_i = area of impervious surface, SF

A_{tg} = area of till grass and pasture, SF

A_{tf} = area of till forest, SF

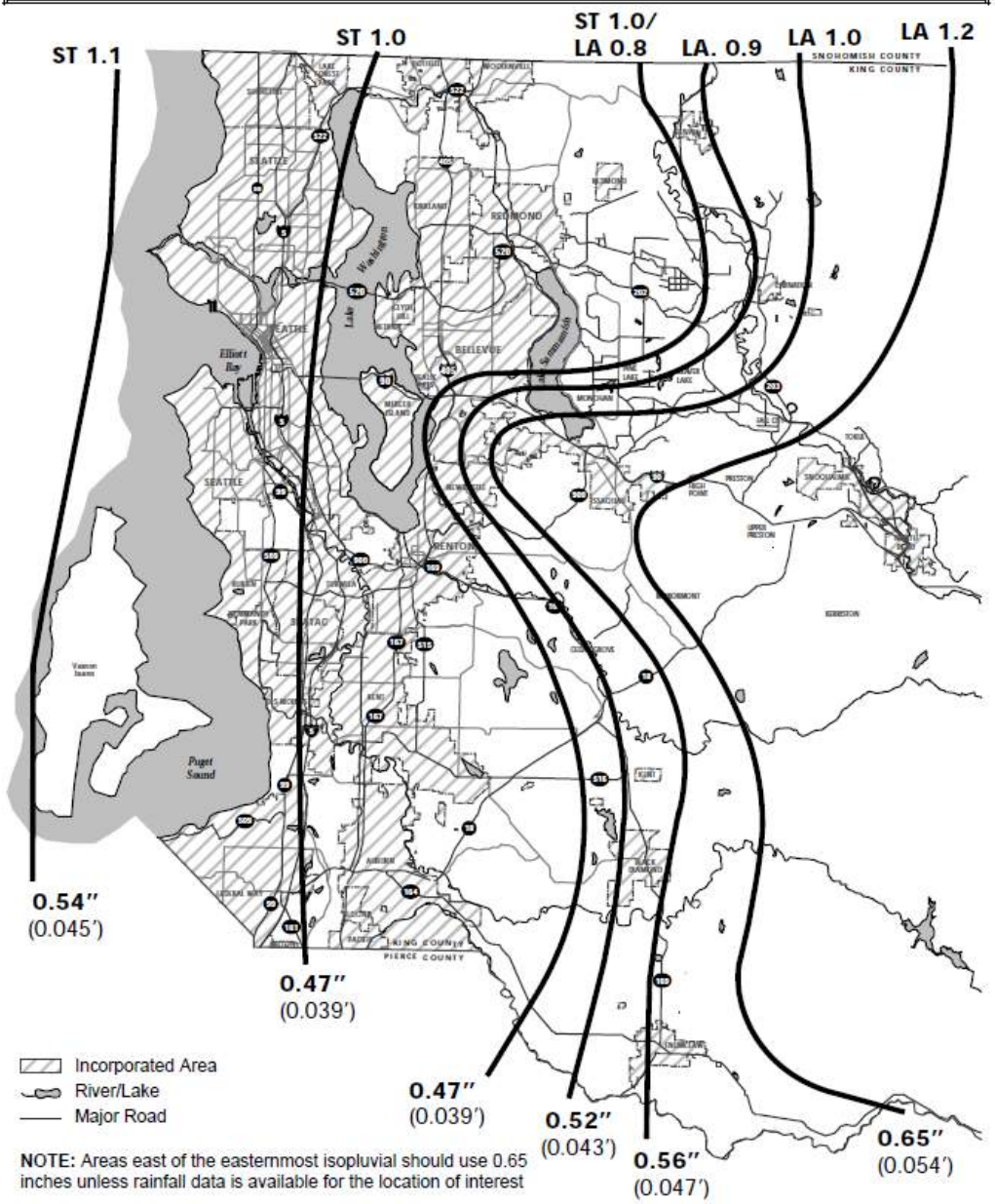
A_o = area of outwash soils, SF

R = rainfall from mean annual storm = 0.05 feet (from Fig 6.4.1.A at the end of this section.)

$V_B = 3[0.9(0.98) + 0.25(0.38) + 0.1(0.56) + 0.01(1.06)]*43{,}560*0.05 = 6{,}819$ CF

A dead storage volume of 6,819 cubic feet is necessary to satisfy the water quality requirement for the entire site. Assuming an average of 5 feet of dead storage, the on site vaults provide a total of 7,375 CF of storage volume. The provided volume is greater than the required volume calculated above, meeting the water quality requirement for the site.

FIGURE 6.4.1.A PRECIPITATION FOR MEAN ANNUAL STORM IN INCHES (FEET)



NOTE: Areas east of the easternmost isopluvial should use 0.65 inches unless rainfall data is available for the location of interest

5 CONVEYANCE SYSTEM ANALYSIS AND DESIGN

Conveyance calculations to be provided with final engineering.

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6 SPECIAL REPORTS AND STUDIES

(Under separate cover)

The following reports and assessments are provided for reference and informational purposes only. Core Design takes no responsibility or liability for these reports, assessments or designs as they were not completed under the direct supervision of Core Design.

- Tibbetts Creek Traffic Analysis
  Prepared by: Michael Read, P.E.
  Dated: September 5, 2018
  TENW
  11400 SE 8th Street, Suite 200
  Bellevue, Wa 98004

- Arborist Report, Tibbetts Crossing
  Prepared by: Lonnie Olson, ISA Certified Arborist
  Dated: July 9, 2018
  Lonnson Arbor Care
  2616 169th Street SE
  Bothell, WA 98012

- Preliminary Geotechnical Engineering Report
  Prepared by: Matthew A. Miller, P.E.
  Dated: May 12, 2017
  Associated Earth Sciences, Inc.
  911 5th Avenue
  Kirkland, WA 98033

- Critical Area Study
  Prepared by: Wetland Resources, Inc.
  Dated: August 5, 2015
  Wetland Resources, Inc.
  9505 19th Ave SE, Suite 106
  Everett, WA 98208

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7 OTHER PERMITS

- NPDES Permit
- Building Permits
- ROW Use Permit
- Site Work Permit

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8 ESC ANALYSIS AND DESIGN

Erosion and sediment control analysis to be provided during final engineering.

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9 BOND QUANTITIES, FACILITY SUMMARIES, AND DECLARATION OF COVENANT

9.1 Bond Quantities

A bond quantity worksheet will be provided during final engineering.

9.2 Facility Summaries

Not applicable.

9.3 Declaration of Covenant

A Declaration of Covenant will be provided during final engineering.

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10 OPERATIONS AND MAINTENANCE

The operations and maintenance information will be provided through select portions from Appendix A of the 2009 KCSWDM during Final Engineering.

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Appendix A

Parcel & Basin Information

- King County Parcel Report
- Figure 2-2 Stormwater Drainage Sub-basins in Issaquah

Department of Assessments

500 Fourth Avenue, Suite ADM-AS-0708, Seattle, WA 98104

Office Hours: Mon - Fri 8:30 a.m. to 4:30 p.m.

TEL: 206-296-7300
FAX: 206-296-5107
TTY: 206-296-7888

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- Glossary of Terms
- Area Report
- Property Detail

PARCEL

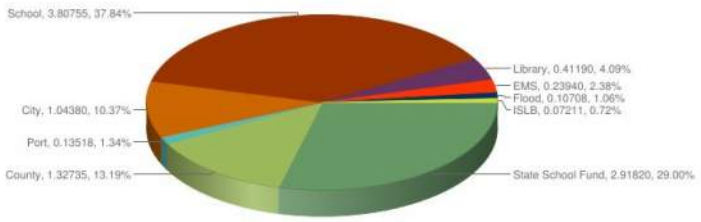
Parcel Number	292406-9041
Name	STEVE BURNSTEAD CONSTRUCTIO
Site Address	7932 RENTON-ISSAQUAH RD SE 98027
Legal	LOT B ISSAQUAH LLA #PLN12-00027 REC #20121213900009 SD LLA BEING POR S 1/2 OF SE 1/4 OF SE 1/4 STR 29-24-6 LESS RD TGW POR NE 1/4 OF NE 1/4 LY ELY OF RD STR 32-24-6

BUILDING 1

Year Built	1922
Total Square Footage	2290
Number Of Bedrooms	5
Number Of Baths	1.00
Grade	7 Average
Condition	Good
Lot Size	955902
Views	No
Waterfront	

TOTAL LEVY RATE DISTRIBUTION

Tax Year: 2018 **Levy Code:** 1404 **Total Levy Rate:** $10.06257 **Total Senior Rate:** $4.92228



56.16% Voter Approved

Click here to see levy distribution comparison by year.

TAX ROLL HISTORY

Valued Year	Tax Year	Appraised Land Value ($)	Appraised Imps Value ($)	Appraised Total ($)	Taxable Land Value ($)	Taxable Imps Value ($)	Taxable Total ($)
2018	2019	883,000	166,000	1,049,000	883,000	166,000	1,049,000
2017	2018	772,000	136,000	908,000	772,000	136,000	908,000
2016	2017	715,000	98,000	813,000	715,000	98,000	813,000
2015	2016	681,000	156,000	837,000	681,000	156,000	837,000
2014	2015	617,000	142,000	759,000	617,000	142,000	759,000
2013	2014	561,000	98,000	659,000	561,000	98,000	659,000
2012	2013	761,200	79,000	840,200	761,200	79,000	840,200
2011	2012	472,000	69,000	541,000	472,000	69,000	541,000
2010	2011	498,000	80,000	578,000	498,000	80,000	578,000
2009	2010	451,000	24,000	475,000	451,000	24,000	475,000
2008	2009	502,000	98,000	600,000	502,000	98,000	600,000
2007	2008	453,000	95,000	548,000	453,000	95,000	548,000
2006	2007	394,000	112,000	506,000	394,000	112,000	506,000
2005	2006	365,000	116,000	481,000	365,000	116,000	481,000
2004	2005	345,000	111,000	456,000	345,000	111,000	456,000
2003	2004	345,000	111,000	456,000	345,000	111,000	456,000
2002	2003	340,000	247,000	587,000	340,000	247,000	587,000

Reference Links:

- King County Taxing Districts Codes and Levies (.PDF)
- King County Tax Links
- Property Tax Advisor
- Washington State Department of Revenue (External link)
- Washington State Board of Tax Appeals (External link)
- Board of Appeals/Equalization
- Districts Report
- iMap
- Recorder's Office
- Scanned images of surveys and other map documents

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Notice mailing date: 07/05/2018

2001	2002	321,000	235,000	556,000	321,000	235,000	556,000
2000	2001	292,000	226,000	518,000	292,000	226,000	518,000
1999	2000	254,000	95,000	349,000	254,000	95,000	349,000
1998	1999	221,000	73,000	294,000	221,000	73,000	294,000
1997	1998	0	0	0	211,000	69,000	280,000
1996	1997	0	0	0	211,000	1,000	212,000
1994	1995	0	0	0	211,000	1,000	212,000
1992	1993	0	0	0	159,300	43,200	202,500
1990	1991	0	0	0	141,000	38,200	179,200
1988	1989	0	0	0	126,900	32,900	159,800
1986	1987	0	0	0	126,900	31,300	158,200
1984	1985	0	0	0	139,600	30,600	170,200
1982	1983	0	0	0	139,600	30,600	170,200

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Updated: March 17, 2016

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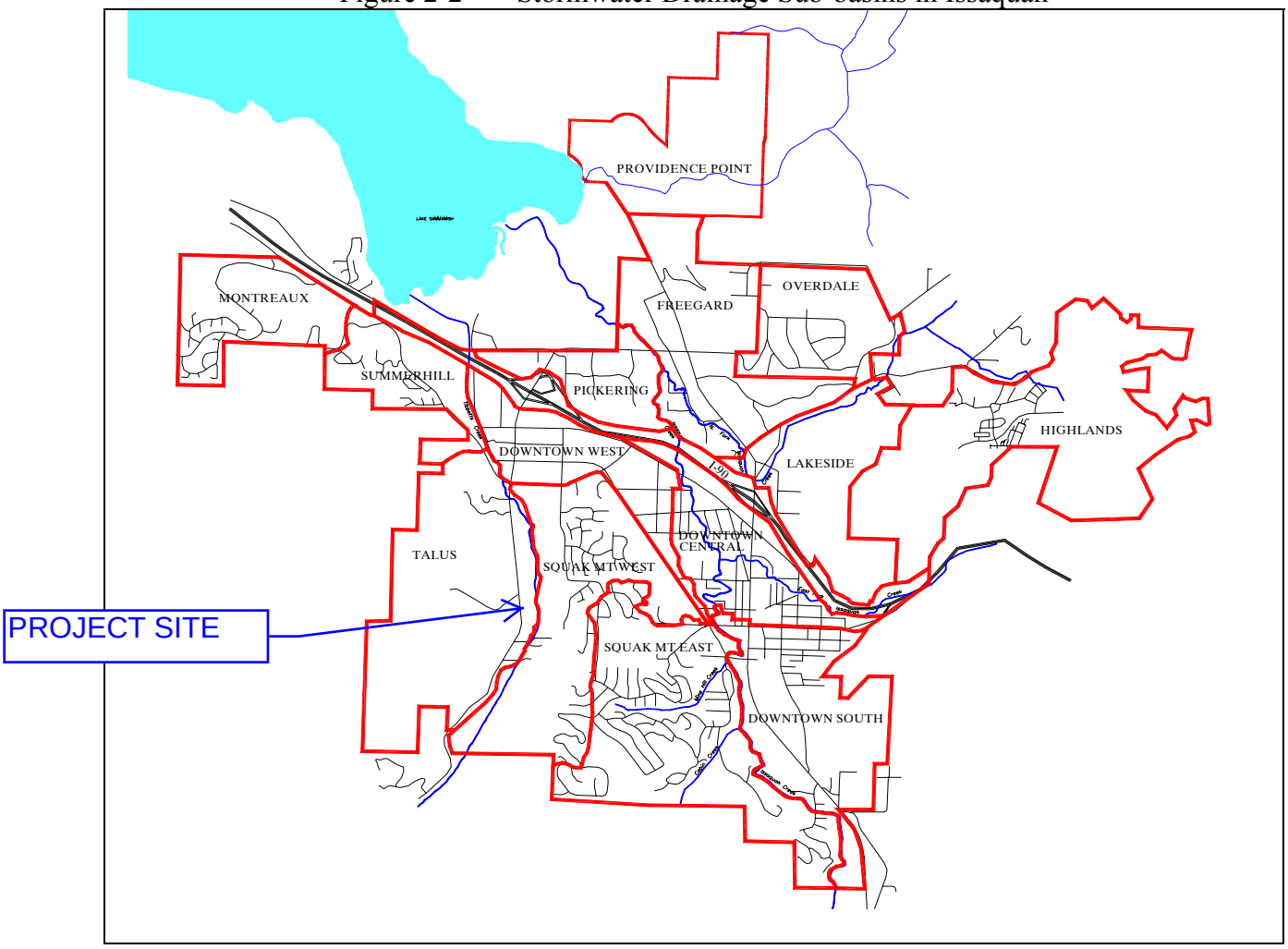
Figure 2-2 Stormwater Drainage Sub-basins in Issaquah



2.2.3 Fish Usage

Table 2-4 summarizes the important fish species that are present in the principal streams in Issaquah, as reported by the Final Issaquah Creek Basin and Non-point Action Plan and the Issaquah Creek Basin Draft Sub-Area Summary.

Table 2-4 Fish Presence in Issaquah Streams

Stream	Species
Issaquah Creek	Chinook, Sockeye, Steelhead, Dolly Varden, Coho, Cutthroat, Rainbow, Kokanee, Bull trout
North Fork Issaquah Creek	Sockeye, Coho, Cutthroat
East Fork Issaquah Creek	Sockeye, Coho, Cutthroat, Chinook, Rainbow
Tibbetts Creek	Coho, Sockeye, Cutthroat

Major species of salmon are described below:

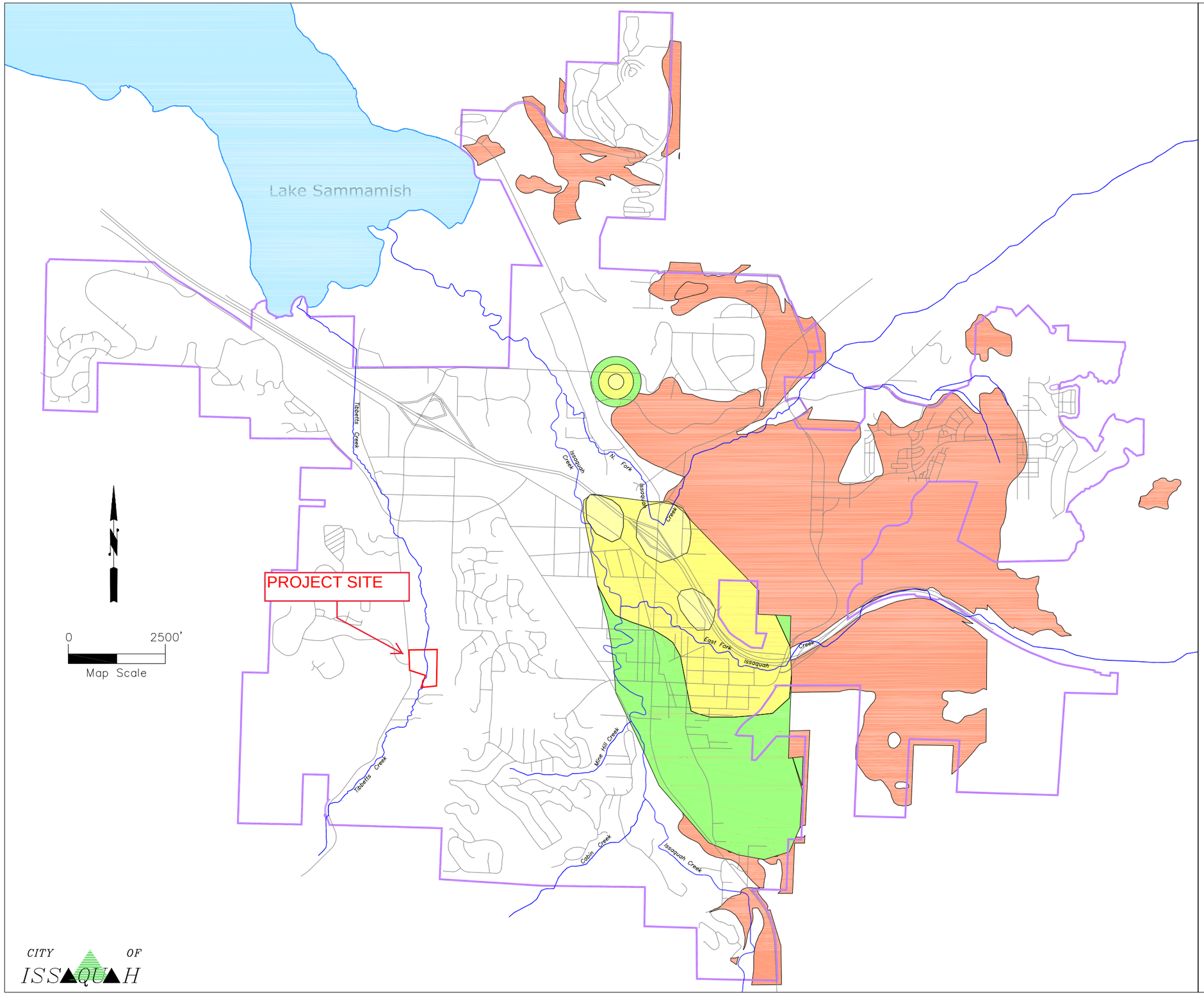
- **Chinook salmon**, also called "king," is the largest of the Pacific Salmon. Chinook have been observed spawning 11 miles upstream on Issaquah Creek in Holder and Carey creeks. They are often found spawning in rivers or larger streams, and are usually one of the earlier salmon species to spawn in the fall. Chinook salmon in Issaquah Creek is entirely of hatchery origin,

Appendix B

Resource Review & Off-site Analysis Documentation

- Critical Aquifer Recharge Area Classification Map
- FEMA Map (53033C0693G)
- USDA NRCS Site Soils Map
- Drainage Complaints Exhibit

CRITICAL AQUIFER RECHARGE AREA CLASSIFICATION MAP



LEGEND

CARA CLASSES

- Class 1 - 1 & 5 year Wellhead Capture Zone
- Class 2 - 10 year Wellhead Capture Zone
- Class 3 - High Aquifer Recharge Area

AB 5676
Exhibit A
Page A-66

Notes:
1) CARA Class 1 and Class 2 are based on wellhead capture zones that are documented in Lower Issaquah Valley Wellhead Protection Plan (Golder Associates, 1993) and Wellhead Protection Delineation for Overdale Well (Golder Associates, 1997).

2) CARA Class 3– High Aquifer Recharge Area is based on surficial geology and soil units have high to moderate susceptibility to contamination. Sources for recharge area mapping include: Geologic Map of the Issaquah 7.5' Quadrangle (Booth and Minard, 1992) for all areas except Issaquah Highlands; Report on Geotechnical Services, Draft Environmental Impact Statement for Proposed Grand Ridge Development (Geoengineers, 1995) for Issaquah Highlands; and King County Soil Survey (U.S. Soil Conservation Service, 1973) for all areas.

CITY OF ISSAQUAH

Exhibit C to Ordinance: CARA Map

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevation** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevation (BFEs) shown on this map apply only landward of 0.0' National Geodetic Vertical Datum (NGVD). Users of this FIRM should be aware that coastal flood elevations may also be provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this community. Elevations shown in the Summary of Stillwater Elevations table should be used for construction, and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures.** Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures in this jurisdiction.

The **projection** used in the preparation of this map is Universal Tranverse Mercator (UTM) zone 10. The **horizontal datum** is NAD27, CLARKE1866 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the National Geodetic Vertical Datum of 1929. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum.** For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

Spatial Reference System Division
National Geodetic Survey, NOAA
Silver Spring Metro Center
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3191

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242,** or visit their website at www.ngs.noaa.gov.

Base map information shown on this FIRM was provided in digital format by the U.S. Bureau of Census TIGER files and have been geopositionally corrected.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

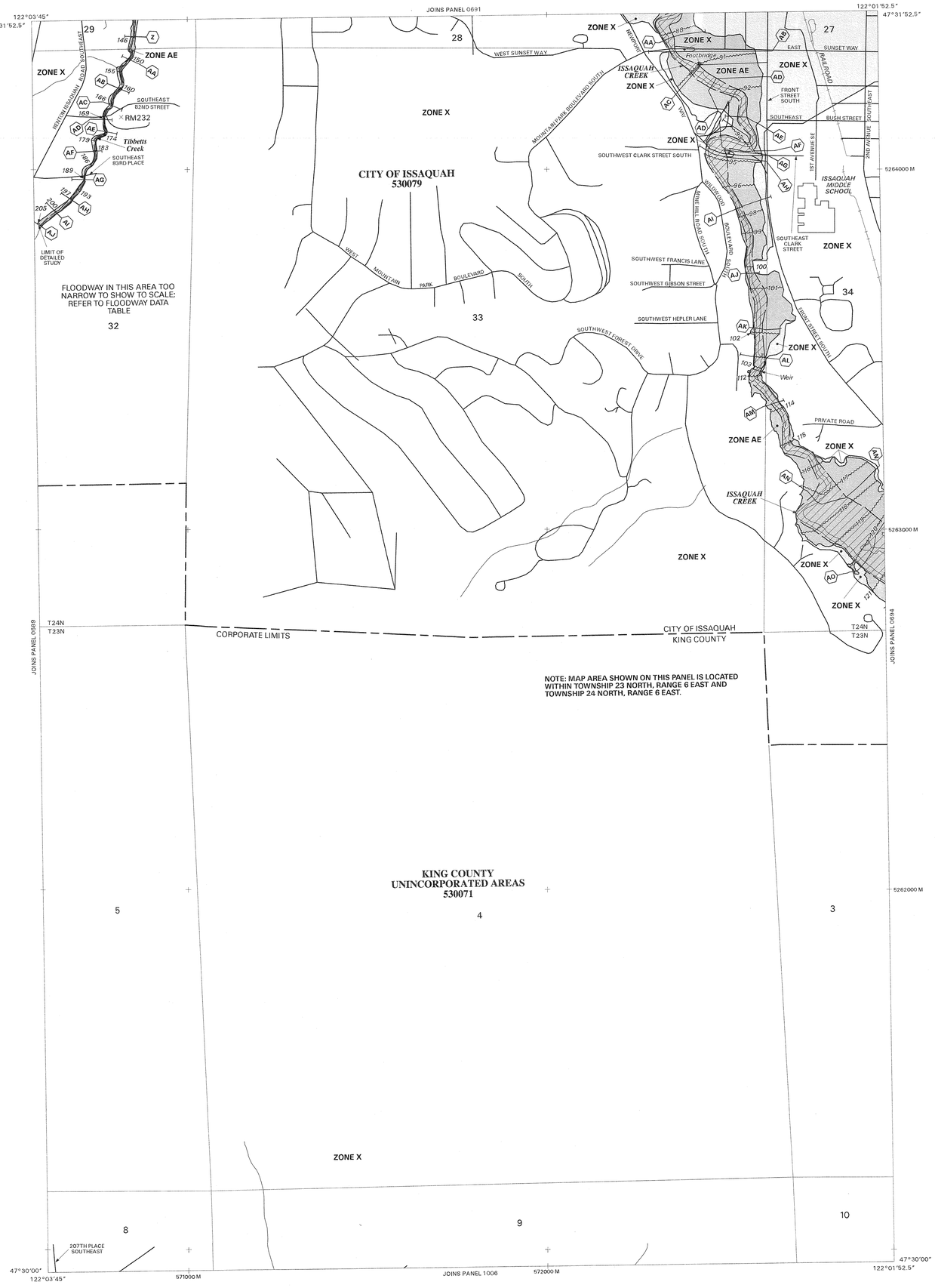
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

An accompanying Flood Insurance Study report, Letters of Map Revision or Letters of Map Amendment revising portions of this panel, and digital versions of this PANEL may be available. Contact the **FEMA Map Service Center** at the following phone numbers and Internet address for infomation on all related products available from FEMA;

Phone: 800-358-9616
FAX: 800-358-9620
www.fema.gov/msc

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at www.fema.gov.

This map reflects more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report may reflect stream channel distances that differ from what is shown on this map.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD EVENT

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood.

ZONE A	No base flood elevations determined.
ZONE AE	Base flood elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Area of special flood hazard formerly protected from the 1% annual chance flood event by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood event.
ZONE A99	Area to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no base flood elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no base flood elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	Floodplain boundary
	Floodway boundary
	Zone D boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or velocities.
513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the National Geodetic Vertical Datum of 1929

(A)———(A)	Cross Section Line
(23)- - - - - -(23)	Transect Line
97°07'30", 32°22'30"	Geographic coordinates referenced to the North American Datum of 1927 (NAD 27)
4276000M	1000-meter Universal Transverse Mercator grid values, zone 10
600000 FT	5000-foot grid ticks
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel).
• M1.5	River Mile

MAP REPOSITORY
Refer to Repository Listing on Index Map

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
SEPTEMBER 29, 1989

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
MAY 16, 1995
April 19, 2005: to update corporate limits, to change base flood elevations, to add base flood elevations, to add special flood hazard areas, to add roads and road names, to reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at (800) 638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0693G

FIRM
FLOOD INSURANCE RATE MAP
KING COUNTY,
WASHINGTON
AND INCORPORATED AREAS

PANEL 693 OF 1725

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

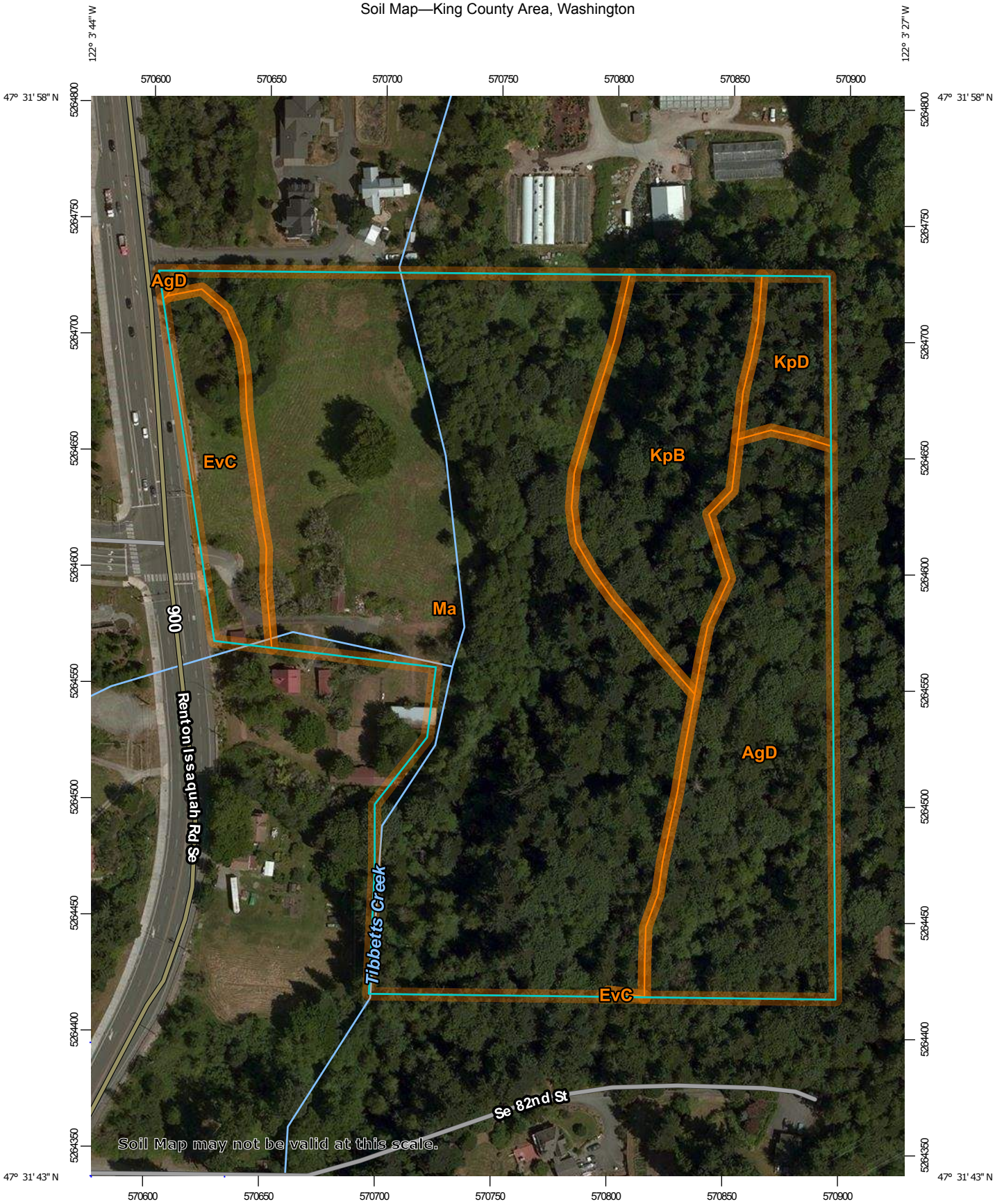
COMMUNITY	NUMBER	PANEL	SUFFIX
KING COUNTY,			
UNINCORPORATED AREAS	530071	0693	G
ISSAQUAH, CITY OF	530079	0693	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
53033C0693G

MAP REVISED:
APRIL 19, 2005

Federal Emergency Management Agency



Map Scale: 1:2,260 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 30 60 120 180

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: King County Area, Washington
Survey Area Data: Version 13, Sep 7, 2017

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

Date(s) aerial images were photographed: Jul 8, 2014—Jul 15, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AgD	Alderwood gravelly sandy loam, 15 to 30 percent slopes	3.7	20.4%
EvC	Everett very gravelly sandy loam, 8 to 15 percent slopes	1.0	5.7%
KpB	Kitsap silt loam, 2 to 8 percent slopes	2.4	12.9%
KpD	Kitsap silt loam, 15 to 30 percent slopes	0.6	3.2%
Ma	Mixed alluvial land	10.5	57.7%
Totals for Area of Interest		**18.3**	**100.0%**

Drainage Complaint Exhibit

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Date: 9/6/2018 Notes:

N

King County
GIS Center

Appendix C

Vault Sizing

- West Vault Summary
- East Vault Summary
- Site Flow Frequency Plot
- Site Flow Duration Plot

Retention/Detention Facility

Type of Facility: West Detention Vault
Facility Length: 50.00 ft
Facility Width: 25.00 ft
Facility Area: 1250. sq. ft
Effective Storage Depth: 8.80 ft
Stage 0 Elevation: 0.00 ft
Storage Volume: 11000. cu. ft
Riser Head: 8.80 ft
Riser Diameter: 12.00 inches
Number of orifices: 3

Orifice #	Height (ft)	Diameter (in)	Full Head Discharge (CFS)	Pipe Diameter (in)
1	0.00	1.38	0.152	
2	3.00	1.00	0.065	4.0
3	6.50	1.00	0.041	4.0

Top Notch Weir: None
Outflow Rating Curve: None

Stage (ft)	Elevation (ft)	Storage (cu. ft)	(ac-ft)	Discharge (cfs)	Percolation (cfs)
0.00	0.00	0.	0.000	0.000	0.00
0.01	0.01	13.	0.000	0.006	0.00
0.03	0.03	38.	0.001	0.009	0.00
0.04	0.04	50.	0.001	0.011	0.00
0.06	0.06	75.	0.002	0.012	0.00
0.07	0.07	88.	0.002	0.014	0.00
0.09	0.09	113.	0.003	0.015	0.00
0.10	0.10	125.	0.003	0.016	0.00
0.11	0.11	138.	0.003	0.017	0.00
0.13	0.13	163.	0.004	0.018	0.00
0.30	0.30	375.	0.009	0.028	0.00
0.47	0.47	588.	0.013	0.035	0.00
0.65	0.65	813.	0.019	0.041	0.00
0.82	0.82	1025.	0.024	0.046	0.00
0.99	0.99	1238.	0.028	0.051	0.00
1.16	1.16	1450.	0.033	0.055	0.00
1.34	1.34	1675.	0.038	0.059	0.00
1.51	1.51	1888.	0.043	0.063	0.00
1.68	1.68	2100.	0.048	0.067	0.00
1.85	1.85	2313.	0.053	0.070	0.00
2.03	2.03	2538.	0.058	0.073	0.00
2.20	2.20	2750.	0.063	0.076	0.00
2.37	2.37	2963.	0.068	0.079	0.00
2.54	2.54	3175.	0.073	0.082	0.00
2.72	2.72	3400.	0.078	0.085	0.00
2.89	2.89	3613.	0.083	0.087	0.00
3.00	3.00	3750.	0.086	0.089	0.00
3.01	3.01	3763.	0.086	0.089	0.00

3.02	3.02	3775.	0.087	0.090	0.00
3.03	3.03	3788.	0.087	0.091	0.00
3.04	3.04	3800.	0.087	0.093	0.00
3.05	3.05	3813.	0.088	0.095	0.00
3.06	3.06	3825.	0.088	0.097	0.00
3.07	3.07	3838.	0.088	0.097	0.00
3.08	3.08	3850.	0.088	0.098	0.00
3.26	3.26	4075.	0.094	0.106	0.00
3.43	3.43	4288.	0.098	0.113	0.00
3.60	3.60	4500.	0.103	0.118	0.00
3.77	3.77	4713.	0.108	0.123	0.00
3.95	3.95	4938.	0.113	0.128	0.00
4.12	4.12	5150.	0.118	0.133	0.00
4.29	4.29	5363.	0.123	0.137	0.00
4.46	4.46	5575.	0.128	0.141	0.00
4.64	4.64	5800.	0.133	0.145	0.00
4.81	4.81	6013.	0.138	0.149	0.00
4.98	4.98	6225.	0.143	0.153	0.00
5.15	5.15	6438.	0.148	0.156	0.00
5.33	5.33	6663.	0.153	0.160	0.00
5.50	5.50	6875.	0.158	0.163	0.00
5.67	5.67	7088.	0.163	0.166	0.00
5.84	5.84	7300.	0.168	0.170	0.00
6.02	6.02	7525.	0.173	0.173	0.00
6.19	6.19	7738.	0.178	0.176	0.00
6.36	6.36	7950.	0.183	0.179	0.00
6.50	6.50	8125.	0.187	0.181	0.00
6.51	6.51	8138.	0.187	0.182	0.00
6.52	6.52	8150.	0.187	0.183	0.00
6.53	6.53	8163.	0.187	0.184	0.00
6.54	6.54	8175.	0.188	0.185	0.00
6.55	6.55	8188.	0.188	0.187	0.00
6.56	6.56	8200.	0.188	0.189	0.00
6.57	6.57	8213.	0.189	0.190	0.00
6.58	6.58	8225.	0.189	0.191	0.00
6.59	6.59	8238.	0.189	0.191	0.00
6.77	6.77	8463.	0.194	0.200	0.00
6.94	6.94	8675.	0.199	0.207	0.00
7.11	7.11	8888.	0.204	0.213	0.00
7.28	7.28	9100.	0.209	0.219	0.00
7.46	7.46	9325.	0.214	0.224	0.00
7.63	7.63	9538.	0.219	0.229	0.00
7.80	7.80	9750.	0.224	0.234	0.00
7.97	7.97	9963.	0.229	0.238	0.00
8.15	8.15	10188.	0.234	0.243	0.00
8.32	8.32	10400.	0.239	0.247	0.00
8.49	8.49	10613.	0.244	0.251	0.00
8.66	8.66	10825.	0.249	0.255	0.00
8.80	8.80	11000.	0.253	0.259	0.00
8.90	8.90	11125.	0.255	0.569	0.00
9.00	9.00	11250.	0.258	1.130	0.00
9.10	9.10	11375.	0.261	1.870	0.00
9.20	9.20	11500.	0.264	2.660	0.00
9.30	9.30	11625.	0.267	2.940	0.00

9.40	9.40	11750.	0.270	3.200	0.00
9.50	9.50	11875.	0.273	3.440	0.00
9.60	9.60	12000.	0.275	3.660	0.00
9.70	9.70	12125.	0.278	3.870	0.00
9.80	9.80	12250.	0.281	4.060	0.00
9.90	9.90	12375.	0.284	4.250	0.00
10.00	10.00	12500.	0.287	4.430	0.00
10.10	10.10	12625.	0.290	4.600	0.00
10.20	10.20	12750.	0.293	4.760	0.00
10.30	10.30	12875.	0.296	4.920	0.00
10.40	10.40	13000.	0.298	5.080	0.00
10.50	10.50	13125.	0.301	5.230	0.00
10.60	10.60	13250.	0.304	5.370	0.00

Hyd	Inflow	Outflow	Peak		Storage	
			Stage	Elev	(Cu-Ft)	(Ac-Ft)
1	0.81	0.70	8.92	8.92	11155.	0.256
2	0.45	0.23	7.55	7.55	9442.	0.217
3	0.43	0.18	6.32	6.32	7899.	0.181
4	0.23	0.13	4.17	4.17	5212.	0.120
5	0.27	0.13	4.07	4.07	5082.	0.117
6	0.21	0.11	3.46	3.46	4320.	0.099
7	0.36	0.07	1.90	1.90	2371.	0.054
8	0.19	0.06	1.24	1.24	1554.	0.036

Hyd	R/D Facility	Tributary	Reservoir	POC Outflow	
	Outflow	Inflow	Inflow	Target	Calc
1	0.70	0.18	********	*******	0.86
2	0.23	0.09	********	*******	0.29
3	0.18	0.10	********	0.31	0.25
4	0.13	0.05	********	*******	0.18
5	0.13	0.05	********	*******	0.17
6	0.11	0.05	********	0.19	0.15
7	0.07	0.04	********	*******	0.11
8	0.06	0.03	********	*******	0.08

Retention/Detention Facility

Type of Facility:	East Detention Vault	
Facility Length:	45.00	ft
Facility Width:	5.00	ft
Facility Area:	225.	sq. ft
Effective Storage Depth:	4.80	ft
Stage 0 Elevation:	0.00	ft
Storage Volume:	1080.	cu. ft
Riser Head:	4.80	ft
Riser Diameter:	12.00	inches
Number of orifices:	2	

Orifice #	Height (ft)	Diameter (in)	Full Head Discharge (CFS)	Pipe Diameter (in)
1	0.00	1.00	0.059	
2	3.50	0.75	0.017	4.0

Top Notch Weir: None

Outflow Rating Curve: None

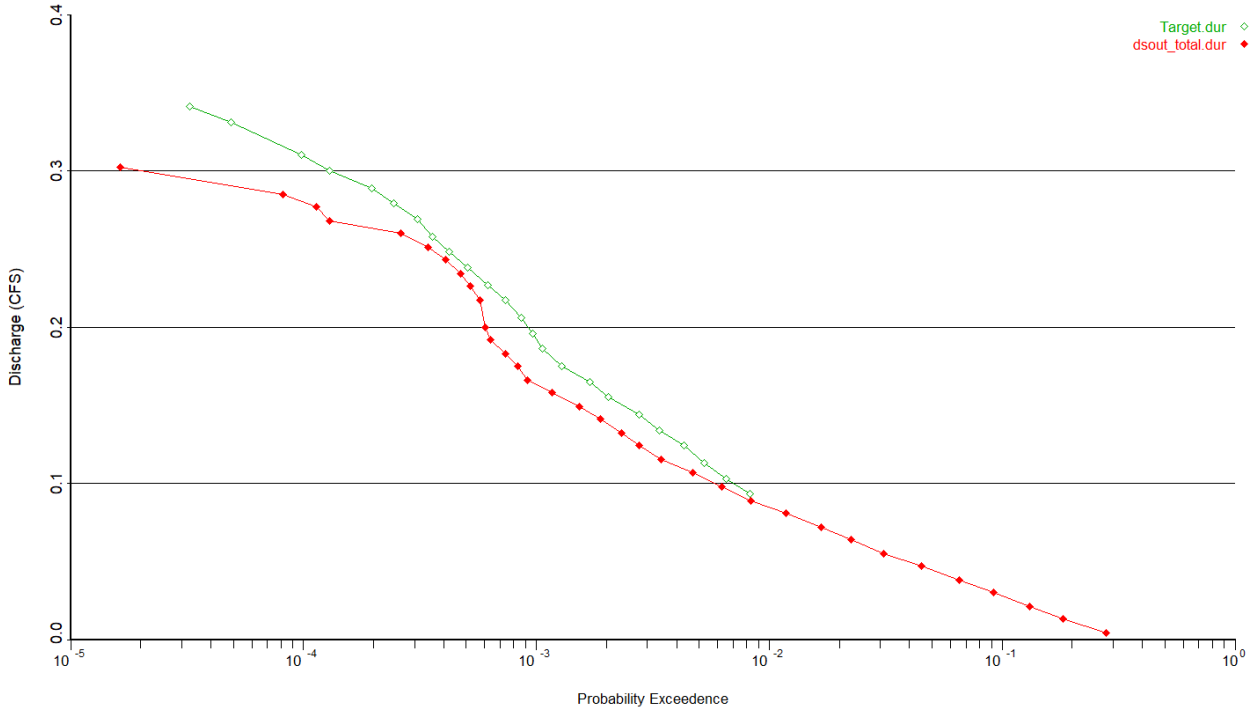
Stage (ft)	Elevation (ft)	Storage (cu. ft)	(ac-ft)	Discharge (cfs)	Percolation (cfs)
0.00	0.00	0.	0.000	0.000	0.00
0.01	0.01	2.	0.000	0.003	0.00
0.02	0.02	5.	0.000	0.004	0.00
0.03	0.03	7.	0.000	0.005	0.00
0.04	0.04	9.	0.000	0.006	0.00
0.05	0.05	11.	0.000	0.006	0.00
0.06	0.06	14.	0.000	0.007	0.00
0.07	0.07	16.	0.000	0.007	0.00
0.08	0.08	18.	0.000	0.008	0.00
0.09	0.09	20.	0.000	0.008	0.00
0.19	0.19	43.	0.001	0.012	0.00
0.29	0.29	65.	0.001	0.015	0.00
0.39	0.39	88.	0.002	0.017	0.00
0.49	0.49	110.	0.003	0.019	0.00
0.59	0.59	133.	0.003	0.021	0.00
0.69	0.69	155.	0.004	0.023	0.00
0.79	0.79	178.	0.004	0.024	0.00
0.89	0.89	200.	0.005	0.026	0.00
0.99	0.99	223.	0.005	0.027	0.00
1.09	1.09	245.	0.006	0.028	0.00
1.19	1.19	268.	0.006	0.030	0.00
1.29	1.29	290.	0.007	0.031	0.00
1.39	1.39	313.	0.007	0.032	0.00
1.49	1.49	335.	0.008	0.033	0.00
1.59	1.59	358.	0.008	0.034	0.00
1.69	1.69	380.	0.009	0.035	0.00
1.79	1.79	403.	0.009	0.036	0.00
1.89	1.89	425.	0.010	0.037	0.00
1.99	1.99	448.	0.010	0.038	0.00

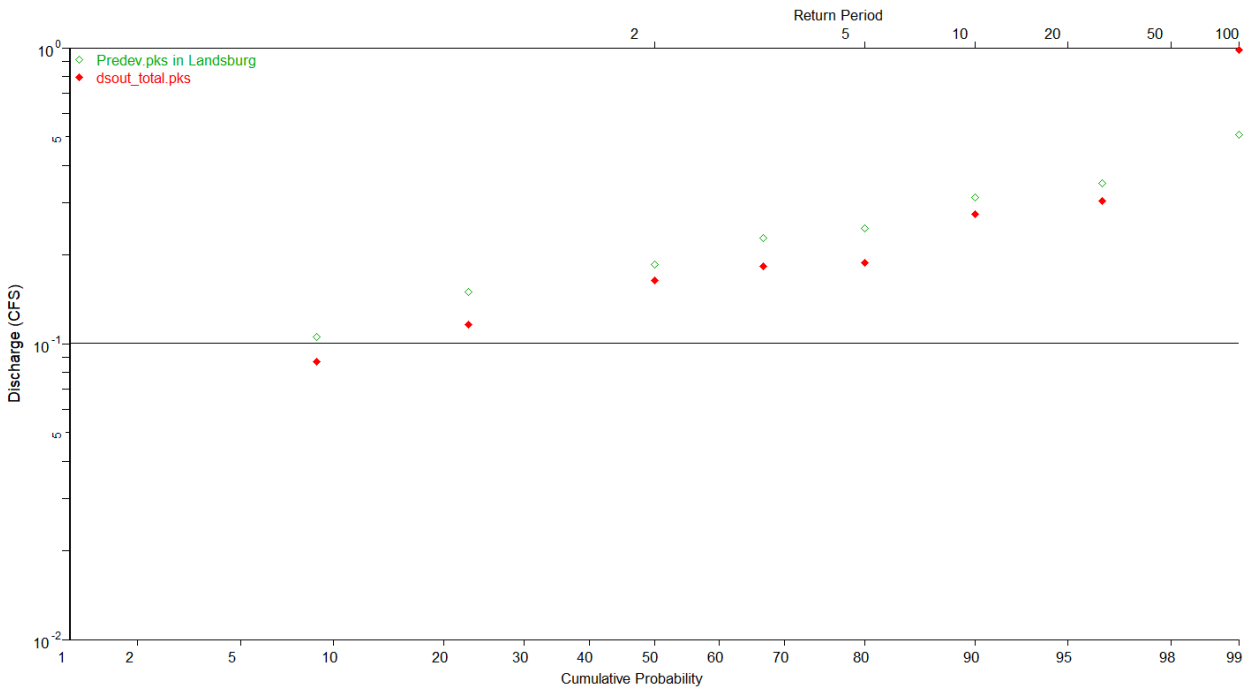
2.09	2.09	470.	0.011	0.039	0.00
2.19	2.19	493.	0.011	0.040	0.00
2.29	2.29	515.	0.012	0.041	0.00
2.39	2.39	538.	0.012	0.042	0.00
2.49	2.49	560.	0.013	0.043	0.00
2.59	2.59	583.	0.013	0.044	0.00
2.69	2.69	605.	0.014	0.045	0.00
2.79	2.79	628.	0.014	0.045	0.00
2.89	2.89	650.	0.015	0.046	0.00
2.99	2.99	673.	0.015	0.047	0.00
3.09	3.09	695.	0.016	0.048	0.00
3.19	3.19	718.	0.016	0.048	0.00
3.29	3.29	740.	0.017	0.049	0.00
3.39	3.39	763.	0.018	0.050	0.00
3.49	3.49	785.	0.018	0.051	0.00
3.50	3.50	788.	0.018	0.051	0.00
3.51	3.51	790.	0.018	0.051	0.00
3.52	3.52	792.	0.018	0.052	0.00
3.53	3.53	794.	0.018	0.053	0.00
3.54	3.54	797.	0.018	0.054	0.00
3.55	3.55	799.	0.018	0.055	0.00
3.56	3.56	801.	0.018	0.055	0.00
3.66	3.66	824.	0.019	0.058	0.00
3.76	3.76	846.	0.019	0.060	0.00
3.86	3.86	869.	0.020	0.062	0.00
3.96	3.96	891.	0.020	0.064	0.00
4.06	4.06	914.	0.021	0.066	0.00
4.16	4.16	936.	0.021	0.068	0.00
4.26	4.26	959.	0.022	0.069	0.00
4.36	4.36	981.	0.023	0.071	0.00
4.46	4.46	1004.	0.023	0.072	0.00
4.56	4.56	1026.	0.024	0.074	0.00
4.66	4.66	1049.	0.024	0.075	0.00
4.76	4.76	1071.	0.025	0.076	0.00
4.80	4.80	1080.	0.025	0.077	0.00
4.90	4.90	1103.	0.025	0.386	0.00
5.00	5.00	1125.	0.026	0.950	0.00
5.10	5.10	1148.	0.026	1.680	0.00
5.20	5.20	1170.	0.027	2.470	0.00
5.30	5.30	1193.	0.027	2.760	0.00
5.40	5.40	1215.	0.028	3.010	0.00
5.50	5.50	1238.	0.028	3.250	0.00
5.60	5.60	1260.	0.029	3.470	0.00
5.70	5.70	1283.	0.029	3.680	0.00
5.80	5.80	1305.	0.030	3.870	0.00
5.90	5.90	1328.	0.030	4.060	0.00
6.00	6.00	1350.	0.031	4.230	0.00
6.10	6.10	1373.	0.032	4.400	0.00
6.20	6.20	1395.	0.032	4.570	0.00
6.30	6.30	1418.	0.033	4.730	0.00
6.40	6.40	1440.	0.033	4.880	0.00
6.50	6.50	1463.	0.034	5.030	0.00
6.60	6.60	1485.	0.034	5.170	0.00
6.70	6.70	1508.	0.035	5.310	0.00

6.80	6.80	1530.	0.035	5.450	0.00

Hyd	Inflow	Outflow	Peak Stage	Peak Elev	Storage (Cu-Ft)	Storage (Ac-Ft)
1	0.16	0.16	4.83	4.83	1086.	0.025
2	0.12	0.07	4.24	4.24	955.	0.022
3	0.10	0.07	4.05	4.05	911.	0.021
4	0.11	0.05	3.42	3.42	770.	0.018
5	0.06	0.05	2.69	2.69	606.	0.014
6	0.07	0.04	2.20	2.20	496.	0.011
7	0.13	0.04	2.49	2.49	561.	0.013
8	0.05	0.03	1.48	1.48	332.	0.008

Hyd	R/D Facility Outflow	Tributary Inflow	Reservoir Inflow	POC Outflow Target	POC Outflow Calc
1	0.16	0.02	********	*******	0.18
2	0.07	0.02	********	*******	0.08
3	0.07	0.01	********	0.03	0.08
4	0.05	0.02	********	*******	0.06
5	0.05	0.01	********	*******	0.05
6	0.04	0.01	********	0.01	0.05
7	0.04	0.02	********	*******	0.05
8	0.03	0.01	********	*******	0.04





"Predev" is the target peak flows for the project site. Note that the total peak outflow of the detention facilities at the 2-year and 10-year event is less than that of the predeveloped condition, meeting the flow control requirement.

CRITICAL AREA STUDY & BUFFER MITIGATION PLAN

FOR

TIBBETTS CROSSING
CITY OF ISSAQUAH, WA

Wetland Resources, Inc. Project #17173

Prepared By
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January 8, 2019
Revision 1: July 11, 2019

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1.0 INTRODUCTION

Wetland Resources, Inc. (WRI) conducted multiple site investigations between November 2014 and June 2017 to locate jurisdictional wetlands and streams within, and in the vicinity of, the investigation area defined on King County tax parcel 2924069041 (See Figure 1). The 21.94-acre subject property is located at 7932 Renton-Issaquah Road SE in Issaquah, Washington; accessible east of Renton-Issaquah Road SE. It's located within the Cedar/Sammamish Watershed, Water Resources Inventory Area 8. The site is further located as a portion of Section 29, Township 24N, Range 06E, W.M.

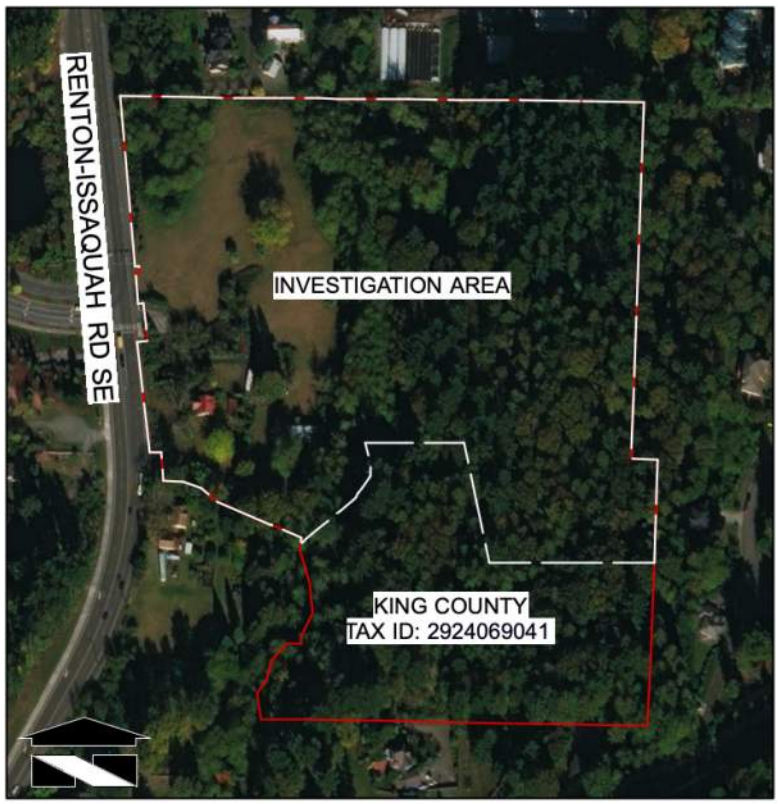

Figure 1 Aerial of the subject property and investigation area defined by WRI (not to scale).

Six wetlands (Wetlands A through F) and three streams (Tibbetts Creek, Stream A, and Stream B) were identified within, and in the vicinity of, the investigation area. The boundaries and categories of Wetlands A, B, and C were previously approved and are vested to the old critical area regulations (prior to December 28, 2016). These features were reviewed during the 2017 site visit, and conditions remain the same as the approved delineation. The intent of this document is to characterize all identified critical areas and buffers in the vicinity of the within and in the vicinity of the investigation area, assess potential impacts associated with the applicant's development proposal, and provide mitigation adequate to compensate for all proposed impacts.

1.1 SITE DESCRIPTION

The subject property is partially developed, with a single-family residence, barn, several outbuildings, and a gravel driveway with parking area in the western region of the site. The east side of the property is composed of undeveloped forest, with a few pedestrian/bike trails. Renton-Issaquah Road SE borders the west side of the property. Surrounding land use is primarily single-family residential, with large lots to the north and south, with denser residential development to the east of the subject property.

The delineation focused on the northern portion of the subject property, as defined by the investigation area (See Sheet 1 in Appendix D). Tibbetts Creek bisects the investigation area, separating it into two distinct regions. The western side includes pasture area and the aforementioned development. The eastern portion is undeveloped and composed primarily of native forested vegetation. A mix of grasses (reed canary grass, bluegrass, and bent grass) and shrubs (cut-leaf blackberry and Himalayan blackberry) vegetate the pastured areas. Within the forested areas, vegetation is typical of Puget Sound lowland forest, consisting primarily of western red cedar, western hemlock, big-leaf maple, red alder, salmonberry, vine maple, Pacific willow, red elderberry, Himalayan blackberry, Osoberry, and sword fern.

Six wetlands (Wetland A through F) and three streams (Tibbetts Creek, Stream A, and Stream B) were identified within, and adjacent to, the investigation area. No other critical areas were identified within or adjacent to the investigation area.

2.0 REVIEW OF EXISTING INFORMATION

Prior to conducting the site investigation, public resource information was reviewed to gather background information on the subject property and the surrounding area in regards to wetlands, streams, and other critical areas. These sources included the USFWS National Wetlands Inventory (NWI), USDA/NRCS Web Soil Survey, Snohomish County PDS Map Portal, WDFW SalmonScape mapping tool, and WDFW Priority Habitat and Species (PHS).

- The National Wetlands Inventory depicts two wetland areas on the site, one in the center and one in the northwest area of the site.
- NRCS maps soils on the subject property as Everett very gravelly sandy loam (8 to 15 percent slopes), mixed alluvial land, Alderwood gravelly sandy loam (15 to 30 percent slopes), and Kitsap silt loam (2 to 8 percent slopes).
- King County iMap indicates the presence of one wetland and three streams on the west side of property.
- WDFW SalmonScape shows two streams on-site, with documented salmon presence in Tibbetts Creek.
- WDFW Priority Habitat and Species (PHS) shows a wetland area on-site along Tibbetts Creek and within the northwest corner of the site. Multiple species of salmonids are mapped within Tibbetts Creek. In addition, the township that the subject property is located in is mapped as containing a communal roost(s) for Townsend's Big-eared Bat and Yuma myotis.

3.0 WETLAND & STREAM DETERMINATION

3.1 STREAM DETERMINATION METHODOLOGY

Streams observed on the subject property were identified using the methodologies described in the *Washington State Department of Ecology (DOE), Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State* (Anderson et al. 2016). The Washington State Shoreline Management Act (SMA) defines ordinary high water mark as,

> *"…that mark that will be found by examining the bed and banks and ascertaining where the presence and action of waters are so common and usual, and so long continued in all ordinary years, as to mark upon the soil a character distinct from that of the abutting upland, in respect to vegetation as that condition exists on June 1, 1971, as it may naturally change thereafter, or as it may change thereafter in accordance with permits issued by a local government or the department: PROVIDED, that in any area where the ordinary high water mark cannot be found, the ordinary high water mark adjoining salt water shall be the line of mean higher high tide and the ordinary high water mark adjoining fresh water shall be the line of mean high water."*

3.2 WETLAND DETERMINATION METHODOLOGY

A boundary determination was conducted for the on-site wetland. Wetland conditions were evaluated and delineated using routine methodology described in the *Corps of Engineers Wetlands Delineation Manual* (*Final Report*; January 1987), except where superseded by the *2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (*Version 2.0*, referred to as 2010 Regional Supplement). Our findings are consistent with these manuals. The following criteria descriptions were used in the boundary determination of on-site wetlands:

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

3.2.1 Hydrophytic Vegetation Criteria

The manuals define hydrophytic vegetation as the sum total of macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present. One of the most common indicators for hydrophytic vegetation is when more than 50 percent of a plant community consists of species rated "Facultative" and wetter on lists of plant species that occur in wetlands.

3.2.2 Soils Criteria and Mapped Description

The manuals define hydric soils as those 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 for determining whether a given soil meets the definition for hydric soils.

Four soil units are mapped on-site: Everett very gravelly sandy loam (8 to 15 percent slopes), mixed alluvial land, Alderwood gravelly sandy loam (15 to 30 percent slopes), and Kitsap silt loam (2 to 8 percent slopes).

Everett very gravelly sandy loam (8 to 15 percent slopes) is made up of somewhat excessively drained soils that are underlain by very gravelly sand. These soils formed in sandy and gravelly glacial outwash deposits, under conifers. The O-horizon is composed of slightly decomposed plant material. The A-horizon consists of very dark brown soil color. The B-horizon consists of dark brown soil color. The C-horizon consists of dark yellowish brown soil color. Available water capacity is low. Included within this soil unit are the Alderwood and Indianola soil series. Permeability is rapid.

Mixed alluvial land consists of nearly level areas of unconsolidated alluvium deposited by streams. The alluvium is generally stratified and ranges widely in texture. It is subject to frequent changes caused by stream overflow, but has been in place long enough for vegetation to become established.

Alderwood gravelly sandy loam (15 to 30 percent slopes) is described as a moderately well drained soil on till plains. It is moderately deep over a hardpan. This soil formed in glacial till. Typically, the surface layer is very dark grayish brown gravelly sandy loam about 7 inches thick. The upper part of the subsoil is dark yellowish brown and dark brown very gravelly sandy loam about 23 inches thick. Included in this unit are small areas of soils that have a stony or bouldery surface layer and areas of McKenna soils, Norma soils, and Terric Medisaprists in drainageways on plains. Also included are small areas of Everett, Indianola, and Ragnar soils on terraces and outwash plains. Included areas make up about 15 percent of the total acreage. Permeability of this soil is moderately rapid above the hardpan and very slow through it. Available water capacity is low.

Kitsap silt loam (2 to 8 percent slopes) is described as an undulating soil is on low terraces of the major valleys of the area. The A horizon ranges from very dark brown to dark brown. The B horizon ranges from dark yellowish brown to dark brown and from silt loam to silty clay loam. Some areas are up to 10 percent included Alderwood gravelly sandy loam; some are up to 5 percent the very deep, sandy Indianola soils, and some are up to 5 percent the poorly drained Bellingham, Tukwila, and Seattle soils. Water flows on top of the substratum in winter. Permeability is moderate above the substratum and very slow within it. Available water capacity is moderate to moderately high.

Soils found on-site are consistent with the above mapped soils.

3.2.3 Hydrology Criteria

The 2010 Regional Supplement defines wetland hydrology as "areas that are inundated (flooded or ponded) or the water table is less than or equal to 12 inches below the soil surface for 14 or more consecutive days during the growing season at a minimum frequency of 5 years in 10." During the early growing season, wetland hydrology determinations are made based on physical observation of surface water, a high water table, or saturation in the upper 12 inches. Outside of the early growing season, wetland hydrology determinations are made based on physical

evidence of recent inundation or saturation (i.e. water marks, surface soil cracks, water-stained leaves).

3.3 Boundary Determination Findings

3.3.1 Wetland A

2004 DOE Rating: Category IV
Cowardin Classification: Palustrine, Emergent, Persistent, Saturated.
City of Issaquah Standard Buffer: 40 feet

Wetland A is a small, slope wetland located along the west edge of the subject site adjacent to Renton-Issaquah Road Southeast. Vegetation within this wetland consists primarily of grasses, including: reed canary grass (*Phalaris arundinacea*; FACW), bluegrass (*Poa* sp.), and bent grass (*Agrostis*, sp.). Soils were saturated to the surface at the time of the delineation. Soils in the wetland area are typically a black (10YR 2/1) sandy loam with strong brown (7.5YR 4/6) redoximorphic features. These soils meet hydric soil indicator F6 Redox Dark Surface. Saturated soils were observed.

This wetland received an overall score of 29 points on the Wetland Rating Form, with a moderate habitat score of 9 points. In the City of Issaquah, Category IV wetlands with low habitat scores require standard 40-foot buffers.

3.3.2 Wetland B

2004 DOE Rating: Category III
Cowardin Classification: Palustrine, Forested, Broad-leaved Deciduous, Intermittently Flooded.
City of Newcastle Standard Buffer: 50 feet

Wetland B is a depressional wetland located in the northeast corner of the subject property. It extends slightly off-site to the north and appears to terminate along an adjacent driveway. Observed plant species within this wetland include: red alder (*Alnus rubra*; FAC), Sitka willow (*Salix sitchensis*; FACW), salmonberry (*Rubus spectabilis*; FAC), hardhack (*Spiraea douglasii*; FACW), lady fern (*Athyrium filix-femina*; FAC), creeping buttercup (*Ranunculus repens*; FAC), skunk cabbage (*Lysichiton americanus*; OBL), bluegrass (*Poa sp.*), and bent grass (*Agrostis, sp.*). The soils within the wetland are typically very dark gray (10YR 3/1) silt loam in the upper layer. The sublayer is typically a dark grayish brown (2.5Y 4/2) silt loam with dark yellowish brown (10YR 4/6) redoximorphic features. These soils meet hydric soil indicator F3 Depleted Matrix. Saturated soils were observed.

This wetland received an overall score of 41 points on the Wetland Rating Form, with a low habitat score of 17 points. In the City of Issaquah, Category III wetlands with low habitat scores require standard 50-foot buffers.

3.3.3 Wetland C

2004 DOE Rating: Category III
Cowardin Classification: Palustrine, Forested, Broad-leaved Deciduous, Intermittently Flooded.
City of Issaquah Standard Buffer: 50 feet

Wetland C is a somewhat linear, depressional wetland associated with Tibbetts Creek, which appears to extend off-site to the north. Observed species within this wetland include: red alder (*Alnus rubra*; FAC), salmonberry (*Rubus spectabilis*; FAC), Himalayan blackberry (*Rubus armeniacus*; FAC), reed canary grass (*Phalaris arundinacea*; FACW), and giant horsetail (*Equisetum telmateia*; FACW), bluegrass (*Poa sp.*), and bent grass (*Agrostis, sp.*). The soils within the wetland are typically very dark brown (10YR 2/2) sandy loam in the upper layer. The sublayer is typically a very dark brown (10YR 2/2) sandy clay loam with dark yellowish brown (10YR 3/6) redoximorphic features. These soils meet hydric soil indicator F6 Redox Dark Surface. Saturated soils were observed.

This wetland received an overall score of 38 points on the Wetland Rating Form, with a low habitat score of 18 points. In the City of Issaquah, Category III wetlands with low habitat scores require standard 50-foot buffers.

3.3.4 Wetland D

2004 DOE Rating: Category III
Cowardin Classification: Palustrine, Scrub-Shrub, Broad-leaved Deciduous.
City of Issaquah Standard Buffer: 50 feet

Wetland D is a small, depressional wetland on the east side of Tibbetts Creek located near the northern boundary of the subject property, extending off-site to the north. Vegetation within this wetland includes Himalayan blackberry (*Rubus armeniacus*; FAC), Pacific willow (*Salix lasiandra*; FACW), and red elderberry (*Sambucus racemosa*; FACU). Soils within the wetland were generally very dark grayish brown (10YR 3/2) with brown (7.5YR 4/4) and a sandy clay loam texture in the upper layer. The sublayer was generally grayish brown (2.5Y 5/2) with strong brown (7.5YR 5/6) redoximorphic features and a sandy clay loam texture. These soils meet hydric soil indicator F3 Depleted Matrix. Soils were saturated at 12 inches below the soil surface at the time of the June 2017 site investigation. In addition, secondary indicators of hydrology, Geomorphic Position (D2) and Water-Stained Leaves (B9) were observed.

This wetland received an overall score of 38 points on the Wetland Rating Form, with a low habitat score of 16 points. In City of Issaquah, Category III wetlands with low habitat scores require standard 50-foot buffers.

3.3.5 Wetland E

2004 DOE Rating: Category III
Cowardin Classification: Palustrine, Forested, Needle-leaved Evergreen.
City of Issaquah Standard Buffer: 50 feet

This wetland is a linear slope wetland located in the southeast region of the investigation area. Vegetation within this wetland includes of western red cedar (*Thuja plicata*; FAC), red alder (*Alnus rubra*; FAC), salmonberry (*Rubus spectabilis*; FAC), piggy-back plant (*Tolmeia menziesii*; FAC), and sword fern (*Polystichum munitum*; FACU). Soils in the wetland area are typically a black (10YR 2/1)

sandy clay loam from 0 to 18 inches below the soil surface. At the time of the June 2017 site investigation, soils were saturated to the surface, associated with a high water table.

This wetland received an overall score of 32 points on the Wetland Rating Form, with a low habitat score of 16 points. In City of Issaquah, Category III wetlands with low habitat scores require standard 50-foot buffers.

3.3.6 Wetland F

2004 DOE Rating: Category II
Cowardin Classification: Palustrine, Forested, Broad-leaved Deciduous, Seasonally Flooded/Saturated.
City of Issaquah Standard Buffer: 75 feet

This wetland is a depressional wetland located in the central region of the subject property, associated with Tibbetts Creek. Vegetation within this wetland includes red alder (*Alnus rubra*; FAC), salmonberry (*Rubus spectabilis*; FAC), piggy-back plant (*Tolmeia menziesii*; FAC), reed canarygrass (*Phalaris arundinacea*; FACW), and scouringrush horsetail (*Equisetum hyemale*; FACW). Soils within Wetland F were generally very dark gray (10YR 3/1) with dark brown (7.5YR 3/4) redoximorphic features from 0 to 16 inches below the soil surface. At the time of the June 2017 site investigation, soils were saturated to the surface, associated with a high water table.

This wetland received an overall score of 53 points on the Wetland Rating Form, with a low habitat score of 19 points. In the City of Issaquah, Category II wetlands with low habitat scores require standard 75-foot buffers.

3.3.7 Tibbetts Creek

City of Issaquah Rating: Class 2
Cowardin Classification: Riverine, Lower Perennial, Unconsolidated Bottom, Cobble-Gravel.
City of Issaquah Standard Buffer: 100 feet

Tibbetts Creek enters the site from the south and flows north through the center of the property, eventually flowing into Lake Sammamish. A tributary (Stream A) to Tibbetts Creek enters the site from the west and flows east along the southern border. Tibbetts Creek flows into Lake Sammamish. Tibbetts Creek has documented presence of Sockeye, Winter Steelhead, Resident Coastal Cutthroat, and Coho, as well as presumed presence (based on lack of gradient barrier) of Fall Chinook. The portion of Tibbetts Creek on-site ranged from 12 to 28 feet in width, with an average width of 17.4 feet across the subject property.

3.3.8 Stream A

City of Issaquah Rating: Class 2
Cowardin Classification: Riverine, Lower Perennial, Unconsolidated Bottom, Cobble-Gravel.
City of Issaquah Standard Buffer: 100 feet

Stream A is a tributary to Tibbetts Creek that enters the site from the west and flows east along the boundary of the subject property. Stream B is a tributary to Tibbetts Creek, with no observed blockage to fish passage at the confluence of the two streams. Therefore, it is presumed salmonids

use this stream. Stream A is classified as a Class 2 stream with salmonids and receives a standard buffer of 100 feet per IMC 18.10.785.

3.3.9 Stream B (Outside Investigation Area)

City of Issaquah Rating: Class 2
Cowardin Classification: Riverine, Lower Perennial, Unconsolidated Bottom.
City of Issaquah Standard Buffer: 100 feet

Stream B is located south of the investigation area and was not delineated. Its location is estimated on the attached Critical Areas Study Map (Appendix C). Stream B is a tributary to Tibbetts Creek that enters the site from the east and flows west until it meets Tibbetts Creek, approximately 60 feet north of where Tibbetts Creek and Stream A meet. Stream B is a tributary to Tibbetts Creek, with no observed blockage to fish passage at the confluence of the two streams. Therefore, it is presumed salmonids use this stream. Stream B is classified as a Class 2 stream with salmonids and receives a standard buffer of 100 feet per IMC 18.10.785.

3.3.10 Non-wetland Areas

Vegetation in the non-wetland area west of Tibbetts Creek is comprised primarily of maintained lawn/pasture, with trees and shrubs immediately adjacent to the creek. Vegetation within the non-wetland area of the subject site includes: big leaf maple (*Acer macrophyllum*; FACU), vine maple (*Acer circinatum*; FAC), Osoberry (*Oemleria cerasiformis*; FACU), Himalayan blackberry (*Rubus armeniacus*; FAC), western sword fern (*Polystichum munitum*; FACU), creeping buttercup (*Ranunculus repens*; FAC), bluegrass (*Poa* sp.), and bent grass (*Agrostis* sp.). Non-wetland soils on the west side of the property generally consist of very dark grayish brown (10YR 3/2) or dark olive brown (2.5Y 3/3) in the top layer with a sub layer of dark yellowish brown (10YR 3/6, 10YR 4/6). The soil textures ranged from a sandy loam to a sandy clay loam.

In non-wetland areas east of Tibbetts Creek, vegetation includes western red cedar (*Thuja plicata*; FAC), western hemlock (*Tsuga heterophylla*; FACU), Himalayan blackberry (*Rubus armeniacus*; FAC), red huckleberry (*Vaccinium parvifolium*; FACU), salmonberry (*Rubus spectabilis*; FAC), sword fern (*Polystichum munitum*; FACU), vanilla leaf (*Achlys triphylla*; UPL), and lady fern (*Athyrium filix-femina*; FAC). Soils in these areas are generally a very dark brown to very dark grayish brown (10YR 2/2, 10YR 3/2) with a silty loam texture in the upper layer. In the sublayer, soils are generally a dark brown to dark yellowish brown (10YR 3/3, 10YR 3/4) with a sandy loam texture in the sublayer. No saturation or high water table was observed in these areas.

Given that the dominant vegetative community in these areas is not hydrophytic, direct hydrologic indicators are lacking, and hydric soils are absent in these areas, it appears that areas mapped as non-wetland do not meet criteria for wetlands.

4.0 WILDLIFE

During June 2017, site visit, various songbirds were observed in the area and frog song was heard near the wetlands. As previously mentioned, WDFW Priority Habitat and Species (PHS) shows a wetland area on-site along Tibbetts Creek and within the northwest corner of the site. Additionally, multiple species of salmonids are mapped within Tibbetts Creek, and the township that the subject property is located in is mapped as containing communal roost(s) for Townsend's Big-eared Bat and Yuma myotis.

In addition, the following wildlife is expected to use the area. Avian species expected to use the subject site include: American crow (*Corvus brachyrhynchos*), American robin (*Turdus migratorius*), house finch (*Carpodacus mexicanus*), black-capped chickadee (*Poecile atricapillus*), dark-eyed junco (*Junco hyemalis*), various woodpecker species, Great blue heron (*Ardea herodias),* brown creeper (*Certhia americana*), and various waterfowl. Mammals expected to use this site include: Virginia opossum (*Didelphis virginiana*), shrews (*Sorex spp*.), eastern gray squirrel (*Sciurus carolinensis*), raccoon (*Procyon lotor*), and eastern cottontail rabbits (*Sylvilagus floridanus*), Columbian black-tailed deer (*Odocoileus hemionus columbianus*), and coyotes (*Canis latrans*). Other wildlife expected to use this site include: pacific tree frog (*Hyla regilla*), northwestern salamander (*Ambystoma gracile*), and rough-skinned newt (*Taricha granulosa*).

5.0 PROJECT DESCRIPTION

The applicant is proposing to construct a 20-lot subdivision and associated infrastructure on the subject site. An easement for a pedestrian trail will be dedicated as part of the proposed development. In order to accommodate the necessary point of entry to the site and a bridge crossing to reach the east side of the stream, buffer impacts will occur. Mitigation for buffer impacts will be provided through a combination of designating additional buffer area and buffer enhancement. Buffer averaging is proposed to modify the buffer along the lots 6 - 11 and 15 and 16. Details of the buffer impacts and buffer averaging are provided in *Sections 6 and 7, Wetland & Buffer Averaging and Tibbetts Creek Buffer Impacts and Mitigation,* of this report. In order to reduce the potential impacts of this development, the project is proposing the following minimization measures (see Table 1).

Potential Disturbance	Activities/Cause of Disturbance	Proposed Measures to Minimize Impacts
Lights	• Residential use	Lights that may reach on-site wetlands from residential lots are rear yard lights, which will typically be used for short-term duration and controlled manually. No lights will be located on the perimeter of the wetlands, just along the road.
Noise	• Residential use	The project site is situated along a busy arterial. On-site traffic will be limited to residents and guests who will primarily use driveways and street parking.
Toxic runoff	• Residential use • Landscaping	All runoff from this new development will be collected/treated in a manner consistent with stormwater treatment standards and will meet state water quality standards.
Stormwater runoff	• Residential use • Landscaping	Stormwater will be collected/treated in a manner consistent with the WA Dept. of Ecology 2005 Stormwater Management Manual for Western Washington and City of Issaquah standards.
Change in Water regime	• Lawns • Impermeable surfaces	Stormwater will be routed to infiltration and dispersion trenches along the outer edge of buffer for Tibbetts Creek. This will maintain the hydrology to the wetland and stream buffers.
Pets/Human disturbance	• Residential use	Wetlands, streams, and buffers will be enclosed in separate tracts. Fencing and Critical Area signs will be installed along the edge of on-site buffers adjacent to development.

Table 1 - Disturbance Minimization

6.0 WETLAND & STREAM BUFFER AVERAGING

The applicant is proposing to average the buffers of Wetland B, Wetland F, Tibbetts Creek, and Stream A. The proposed buffer averaging plan complies with the criteria listed in IMC 18.10.650.D(5) and 18.10.790.D(6). All IMC citations relevant to wetland buffer and stream width averaging criteria are presented below in *italics*, followed by applicant responses in standard text.

1. The proposed site plan demonstrates efforts to avoid and minimize wetland/stream and wetland/stream buffer impacts;

The current proposal avoids all impacts to the on-site streams and wetlands and has minimized buffer averaging and buffer impacts to the greatest extent possible, given the constraints of the site (including access, as well as wetland and stream locations).

2. Buffer width averaging is consistent with the best available science and will not adversely impact functions or values;

The areas of buffer reduction and addition for Wetland B are both composed of maintained pasture, thus, the functions and values of Wetland B's buffer will be maintained. Similarly, the areas of buffer reduction and addition for Wetland F are both forested, thus, the functions and values of Wetland F's buffer will be maintained.

The areas of Tibbetts Creek's buffer proposed for reduction are primarily maintained lawn/pasture and non-native Himalayan blackberry, which do not provide a high level of protection. The area of buffer addition (west of Tibbetts Creek) is of similar vegetative structure to the areas of buffer reduction, while the remainder of proposed buffer addition east of Tibbetts Creek is mature, native forest. The areas of Stream A proposed for reduction are maintained pasture, associated with the existing residence on site. The areas of buffer addition are of similar vegetative composition and forested area. Replacing maintained, homogenic buffer area with natively vegetated, forested area will provide a lift to the functions and values of Tibbetts Creek's and Stream A's buffers by better moderating stormwater runoff, reducing soil erosion potential, and providing quality habitat for wildlife to perch, find refuge, and native food sources.

Overall, the proposed buffer width averaging plan is expected to deliver a lift in terms of buffer functions on-site, as it results in increased vegetative/structural diversity and an increase in total buffer area to be protected in perpetuity.

3. The total area within the wetland/stream buffer after averaging is not less than the area within the standard buffer prior to averaging. The location of the replacement buffer area shall be contiguous to the standard buffer to be averaged;

All areas of buffer averaging addition are contiguous to the standard buffer. The amount of proposed buffer averaging reduction and addition were calculated for Wetland B, Wetland F, Tibbetts Creek, and Stream A separately. Because the reduction to the buffer of Stream A is so minimal (reducing the buffer by 3 feet maximum) and it is infeasible to locate the entire additional buffer between Stream A and the proposed development, the applicant will locate the remaining 120 square feet of additional buffer to the east of Tibbetts Creek. Since Stream A is a tributary of Tibbetts Creek and both provide habitat for fish, modifying the buffer maintains the functions of this critical area buffer per IMC 18.10.390, which is to "*protect critical areas from degradation in various ways including the following: stabilizing…protecting plant and animal species and biotic communities associated with the critical area; and reducing disturbances to the resources to the critical area typically caused by the activities of humans and domestic animals*." As the reduction area is small and a permanent protective fence will be installed along the final buffer line, thus reducing disturbance to the buffer of Stream A, this reduction and area of addition contiguous with Stream A's distributary, Tibbetts Creek.

The buffer averaging reductions and additions are listed in the table below.

Critical Area	Buffer Averaging Reduction	Buffer Averaging Addition	Net Gain in Total Buffer Area
Wetland B	977 square feet	1,770 square feet	+793 square feet
Wetland F	45 square feet	45 square feet	0 square feet
Tibbetts Creek	5,615 square feet	5,615 square feet	0 square feet
Stream A	190 square feet	190 square feet	0 square feet

Table 2 - Buffer Averaging Reduction and Addition Areas

4. The buffer width shall not be reduced by more than twenty-five (25) percent of the standard buffer width at any location, unless a variance is approved in accordance with IMC 18.10.430;

The buffer widths of Wetland B, Wetland F, Tibbetts Creek, and Stream A are not reduced by more than 25 percent by buffer averaging. See Table 3, below.

Critical Area	Standard Buffer	Narrowest Point in Proposed Buffer Averaging	Percent Standard Buffer Width Reduced
Wetland B	50 feet	37.5 feet	25 percent
Wetland F	75 feet	73 feet	93 percent
Tibbetts Creek	100 feet	76 feet	24 percent
Stream A	100 feet	97 feet	3 percent

Table 3 - Standard and Proposed Reduced Buffer Widths

5. A maximum of fifty (50) percent of the buffer perimeter on a site may be reduced by buffer averaging;

The buffer perimeters of Wetland B, Wetland F, Tibbetts Creek, and Stream A are not reduced by more than 50 percent through buffer averaging.

Critical Area	Buffer Perimeter (on-site)	Length of Buffer Perimeter Averaged	Percent of Perimeter Averaged
Wetland B	697 feet	251 feet	38 percent
Wetland F	112,144 feet	50 feet	Less than 1 percent
Tibbetts Creek	1,701 feet	201 feet	12 percent
Stream A	157 feet	357 feet	44 percent

Table 4 - Percent of On-site Buffer Perimeter Averaged

6. Buffer averaging shall consider physical characteristics on a site, including but not limited to existing wetland and buffer vegetation, slopes, floodplain, hydrology, surface drainage, and association with nearby wetlands and/or streams. Buffer averaging shall not be allowed within the designated floodway of streams;

The proposed buffer averaging plan will maintain a greater level of functions and values than what is currently provided by on the site. There will be a net gain of buffer area on the site and an increase the area of forested buffer on the site. The proposed areas of buffer addition are located

between the development and affected features and composed of similar or higher quality vegetation than that of the buffer reduction areas. Please see *Section 9, Buffers Functions & Values Assessment*, for a detailed buffer functions and values analysis.

7. Buffer averaging credit shall not be allowed in areas already protected by the critical area regulations.

All proposed buffer addition areas are not currently protected by critical area regulations.

7.0 TIBBETTS CREEK BUFFER IMPACTS & MITIGATION

The applicant is proposing to construct a bridge spanning Tibbetts Creek in order to access Lots 17 through 20, on the western side of the stream. Impacts to the buffer of Tibbetts Creek and subsequent mitigation are discussed in *Section 8, Tibbetts Creek Crossing Buffer Impacts & Mitigation*.

7.1 TIBBETTS CREEK CROSSING

Per IMC 18.10.775, no structures shall be permitted within streams or stream buffer except as outlined in subsection A, which states that stream crossings may be allowed only if they meet the requirements below. All IMC citations relevant to stream crossing criteria are presented below in *italics*, followed by applicant responses in standard text.

> *1. All road and utility crossings shall use bridges or other construction techniques which do not disturb the stream bed or bank; however, in the case of Class 2, 3 or 4 streams, appropriate methods demonstrated to provide fisheries protection may be used if the applicant demonstrates that such methods and their implementation will pose no harm to the stream and will not inhibit migration of fish and will accommodate one hundred (100) year flood flows as established by the City. This shall be accomplished through bridge crossing design and/or appropriate flood control facilities constructed as part of the project design. Any structure spanning a stream shall be designed so the supporting foundation is outside the ordinary high water mark;*

The applicant is proposing to construct a bridge across Tibbetts Creek (Class 2 stream). Construction will not disturb the stream bed or bank. The foundation/abutments for the bridge will be located outside the ordinary high water mark and outside of the floodplain of Tibbets Creek.

> *2. All crossings shall be constructed during summer low flow and be timed to avoid stream disturbance during periods when use is critical to salmonids;*

The crossing will be constructed during summer low flow and will avoid stream disturbance during periods when use is critical to salmonids.

> *3. Crossings shall not occur over salmonid spawning areas unless no other possible crossing site exists on the subject property;*

As WDFW (PHS Map & SalmonScape) indicates that the on-site portion of Tibbetts Creek serves as breeding/rearing habitat for Winter Steelhead and Coho, thus salmonid spawning areas may be present on the site. There is no way to access the east side of the site without crossing Tibbetts

Creek. The applicant will acquire all necessary permits for this component of the project (including Hydraulic Permit Approval) and incorporate WDFW's design recommendations.

> *4. Crossings shall not diminish the flood carrying capacity of the stream;*

The proposed stream crossing has been designed so that no infrastructure will be constructed within the floodplain. The crossing will not diminish the flood carrying capacity of the stream.

> *5. Underground utility crossings shall be located at a preferred depth of four (4) feet below the maximum depth of scour for the base flood predicted by a Washington State licensed civil engineer and be constructed in a manner approved by the Washington State Department of Fisheries; and*

The applicant is proposing to locate all utility lines on the bridge crossing the stream. No underground utilities are proposed under the stream channel.

> *6. Crossings shall be minimized and serve multiple purposes and properties whenever possible.*

There is one proposed crossing that will serve multiple properties (4) on the western side of Tibbetts Creek. All utilities for these lots will be located on the bridge as well.

7.2 TIBBETTS CREEK CROSSING BUFFER IMPACTS & MITIGATION

As a result of the proposed stream crossing, permissible by IMC 18.10.775 (discussed in detail above), 6,915 square feet of permanent impacts to the buffer of Tibbetts Creek are proposed. Per IMC 18.10.795(B)(2), "*Replacement or enhancement is required when the City permits or approves the alteration of a stream buffer. There will be no net loss of stream functions on a development proposal site and no impact on stream functions above or below the site due to the approved alterations.*" As such, to compensate for the 6,915 square feet of stream buffer impacts associated with the crossing, the applicant proposes to replace the lost buffer area by designating 7,625 square feet of additional stream buffer between Tibbetts Creek and the development in the east.

Approximately 15 percent of the portion Tibbetts Creek buffer to be permanently impacted is composed of maintained lawn/pasture and non-native Himalayan blackberry, while the remainder of the impacted area is forested. The entirety of the proposed replacement buffer is forested and greater in area than the area impacted. The proposed mitigation via buffer replacement will result in a greater amount of forested buffer located between Tibbetts Creek and the proposed development, thus acting as additional screening for the stream. As such, the proposed stream buffer impacts and replacement will not result in a net loss or stream function and will not impact stream functions up or downstream, thus meeting the requirements of IMC 18.10.795(B)(2).

8.0 WETLAND BUFFER IMPACTS & MITIGATION

Access to the property is currently just south of Wetland A. In order to avoid wetland impacts that would be associated with constructing access off of the bridge that is adjacent to Wetland A, the applicant is proposing to continue to access the property south of Wetland A. This location will avoid all wetland impacts, but will result in permanent impacts to the wetland buffer. A total of 615 square feet of buffer will be impacted. Mitigation for the permanent buffer impact will be provided through designating 520 square feet of additional buffer and 1,000 square feet of enhancement plantings, resulting in a 2.47:1 mitigation to impact ratio, exceeding the mitigation to impact ratio required by IMC 18.10.720(B)(2). The enhancement plantings will provide additional protective screening to Wetland A.

8.1 BUFFER ENHANCEMENT PLANTINGS (1,000 SQUARE FEET)

Common Name	Latin Name	Size	Spacing	Quantity
Douglas fir	*Pseudotsuga menziesii*	1 gallon	10'	2
Big leaf maple	*Acer macrophyllum*	1 gallon	10'	2
Cascara	*Rhamnus purshiana*	1 gallon	10'	2
Serviceberry	*Amelanchier alnifolia*	1 gallon	5'	7
Nootka rose	*Rosa nutkana*	1 gallon	5'	7
Red elderberry	*Sambucus racemosa*	1 gallon	5'	7
Salmonberry	*Rubus spectabilis*	1 gallon	5'	7
Snowberry	*Symphoricarpos albus*	1 gallon	5'	7

Trees will be planted along the north edge of the enhancement planting area to avoid any future maintenance issues along the roadway.

9.0 BUFFER FUNCTIONS AND VALUES ASSESSMENT

The methodology for this functions and values assessment is based on professional opinion developed through past field analyses and interpretation. This assessment pertains specifically to the wetlands and buffer on site, but is characteristic of similar wetland systems found throughout western Washington.

9.1 EXISTING CONDITIONS

Water Quality
Vegetated wetland buffers obstruct water flow, thereby decreasing water velocity, allowing infiltration into the soil, and reducing soil erosion potential. The majority of the buffer area on-site is pasture area used for grazing cows. The two stream buffers contain shrub and forested areas. This vegetation allows for infiltration and absorption of precipitation. The forested areas provide a moderate level for this function. The pasture areas provide a low level for this function.

Hydrologic functions
Wetland buffers help to moderate water level fluctuations. Buffer vegetation impedes the flow of runoff, increases the humus content of soil (greater adsorption capacity), and preserves soil composition as intense rainfall hits the ground. Buffer within the forested areas perform this

function at a moderate level in the forested areas, while the pasture areas provide a low level for this function.

Wildlife Habitat
Many birds, mammals, and amphibians use wetland and stream buffers for some part of their life needs. Their use of these sites is dependent on the valuable edge habitat found at the wetland/upland border. Buffer vegetation on the site consists of both forested and pasture areas. The on-site forested buffer contains multiple vegetation strata in the understory. The opportunity for perching, refuge, and availability of native food sources provides wildlife habitat. These areas provide a moderate to high level of functions. However, the lack of vegetative diversity and native species in the pasture area limits the food sources available, and those areas provide limited refuge opportunities. The pasture areas provide a low level of wildlife habitat functions.

9.2 Post Construction Buffer Functions and Values

The forested buffer areas will remain intact, and will continue to provide the same level of functions as they do in their existing condition. The buffer reduction areas are composed of lawn/pasture grass and Himalayan blackberry and will be replaced with area of similar composition, thus, there will be no loss of high level of stormwater moderation as well as native food sources, refuge, and other quality habitat features. A portion of Tibbetts Creeks' buffer addition and the entirety of the additional buffer designated as mitigation for the proposed stream impacts, is composed of mature forested vegetation. (see *Section 6, Wetland Buffer & Stream Buffer Width Averaging*).

Overall, the on-site wetlands and streams will benefit from a gain in forested buffer area. The proposed mitigation plan will increase the total amount of buffer on the site by 8,418 square feet, while increasing the amount of forested buffer area. Increasing the quantity and quality of buffer throughout the project site and designating additional buffer area that contains forest with multi-strata understory will improve wildlife habitat, water quality, and hydrologic functions. This will result in a greater amount of higher quality buffer area to be protected in perpetuity.

10.0 Buffer Enhancement Plan Success & Compliance

10.1.1 Criteria for Success
Upon completion of the proposed mitigation project, an inspection by a qualified biologist will be made to determine plan compliance. A compliance report will be supplied to the City of Issaquah within 30 days after the completion of planting. A landscape professional or wetland professional will perform condition monitoring of the plantings annually in the fall. A written report describing the monitoring results will be submitted to the City after each site inspection of each monitored year. Final inspection will occur five years after completion of this project. The contracted consultant will prepare a report as to the success of the project.

10.1.2 Mitigation Plan Objective
The objective of this buffer enhancement plan is to compensate for buffer impact through installation of native plants adjacent to the impact area. This objective will be accomplished if the project meets the definition of success below.

10.1.3 Definition of Success

The planting areas shall meet the following performance standards:

a) End of Year 1: 100 percent survival of newly planted species and less than 10 percent cover of weedy/invasive species,
b) End of Year 3: 80 percent survival of newly planted species and less than 10 percent cover of weedy/invasive species,
c) End of Year 5: at least 70 percent aerial cover of native woody plant species, mitigation plantings must contain at least 6 native tree/shrub species, and less than 15 percent cover of weedy/invasive species. Volunteering native species will be included in the aerial cover calculation.

The species mix should resemble that proposed in the planting plans, but strict adherence to obtaining all of the species shall not be a criterion for success.

10.2 Project Monitoring Program

Requirements for monitoring project:
1. Initial compliance/as-built report
2. Site inspection (twice per year) for five years
3. Annual reports (one report submitted during each monitored year)

10.2.1 Purpose for Monitoring

The purpose for monitoring this mitigation project shall be to evaluate its success. Success will be determined if monitoring shows at the end of five years that the definitions of success stated below are met. The property owner shall grant access to the mitigation area for inspection and maintenance to the contracted landscape and/or wetland specialist and City of Issaquah during the monitoring period or until the project is evaluated as successful.

10.2.2 Monitoring

Monitoring shall be conducted twice annually for five years in accordance with the approved Mitigation Plan. The monitoring period will begin once the City receives written notification confirming the mitigation plan has been implemented and City staff inspects the site and issues approval of the installation.

10.2.3 Vegetation Monitoring

Sampling points or transects will be established for vegetation monitoring and photo points will be established from which photos will be taken throughout the monitoring period. Permanent sampling points must be identified on the mitigation site plans in the first monitoring report (they may be drawn on approved plans by hand). Each sampling point shall detail herbaceous, shrub, and tree coverage. Monitoring of vegetation sampling points shall occur once per monitored year.

10.2.4 Photo points

No less than three permanent photo points will be established within the mitigation areas. Photographs will be taken from these points to visually record condition of the enhancement area.

Photos shall be taken annually between May 15 and September 30 (prior to leaf drop), unless otherwise specified.

10.2.5 Monitoring Report Contents

Monitoring reports shall be submitted by December 31 of each year during the monitoring period. As applicable, monitoring reports must include descriptions / data for:

1. Site plan and vicinity map
2. Historic description of project, including date of installation, current year of monitoring, restatement of mitigation / restoration goals, and performance standards
3. Plant survival, vigor, and areal coverage for every plant community (transect or sampling point data), and explanation of monitoring methodology in the context of assessing performance standards
4. Slope condition, site stability, any structures or special features
5. Wetland and buffer conditions, e.g., surrounding land use, use by humans, and/or wild and domestic creatures
6. Observed wildlife, including amphibians, avians, and others
7. Assessment of nuisance / exotic biota and recommendations for management
8. Color photographs taken from permanent photo-points that shall be depicted on the monitoring report map

10.3 MAINTENANCE

The mitigation areas will require periodic maintenance to remove undesirable species and replace vegetation mortality. Maintenance shall occur in accordance with the approved plans. Chemical control, only if approved by City staff, shall be applied by a licensed applicator following all label instructions.

Duration and Extent

In order to achieve performance standards, the permittee shall have the mitigation area maintained for the duration of the five-year monitoring period. Maintenance will include: watering, weeding around the base of installed plants, pruning, replacement, re-staking, removal of all classes of noxious weeds (see Washington State Noxious Weeds List, WAC 16-750-005) as well as Himalayan blackberry, and any other measures needed to ensure plant survival. The landscape designer and/or wetland professional shall direct all maintenance.

Survival

The permittee shall be responsible for the health of 100% of all newly installed plants for *one growing season* after installation has been accepted by the City of Issaquah. A growing season for these purposes is defined as occurring from spring to spring (March 15 to March 15 of the following year). For fall installation (often required), the growing season will begin the following spring. The permittee shall replace any plants that are: failing, weak, defective in manner of growth, or dead during this growing season, as directed by the landscape designer, wetland professional, and/or City of Issaquah staff.

Installation Timing for Replacement Plants

Replacement plants shall be installed between September 15 and January 15, unless otherwise determined by the landscape designer, wetland professional, and/or City of Issaquah staff.

Standards for Replacement Plants
Replacement plants shall meet the same standards for size and type as those specified for the original installation, unless otherwise directed by the landscape designer, wetland professional, and/or City of Issaquah staff.

Replanting
Plants that have settled in their planting pits too deep, too shallow, loose, or crooked shall be replanted as directed by the landscape designer, wetland professional, and/or City of Issaquah staff.

Herbicides/Pesticides
Chemical controls shall not be used in the mitigation area, sensitive areas, or their buffers. However, limited use of herbicides may be approved depending on site-specific conditions, only if approved by City of Issaquah staff.

Irrigation/Watering
Water should be provided during the dry season (July 1 through October 15) for the first two years after installation to ensure plant survival and establishment. A temporary above ground irrigation system should be installed to provide water. Water should be applied at a rate of 1" of water twice per week for year one and 1" per week during year two. If the mitigation plantings meet 80 percent survival at the end of year two, the system may be removed.

General
The permittee shall include in general maintenance activities the replacement of any vandalized or damaged signs, habitat features, fences, or other structural components of this mitigation site.

10.4 CONTINGENCY PLAN

If 20% of the plants are severely stressed during any of the inspections, or it appears 20% may not survive, additional plantings of the same species may be added to the planting area. Elements of a contingency plan may include, but will not be limited to: more aggressive weed control, pest control, mulching, replanting with larger plant material, species substitution, fertilization, soil amendments, and/or irrigation.

10.5 PROJECT NOTES

Pre-Construction Meeting
Mitigation projects are typically more complex to install than to describe in plans. Careful monitoring by a wetland professional for all portions of this project is strongly recommended. Construction timing and sequencing is important to the success of this type of project. There will be a pre-construction meeting on this site between the Permittee, the consulting wetland professional, and laborers. The objective will be to verify the location of erosion control facilities, verify the location of mitigation areas, and to discuss project sequencing.

Inspections
A wetland professional shall be contracted to periodically inspect the mitigation installation described in this plan. Minor adjustments to the original design may be necessary prior to and

during construction due to unusual or hidden site conditions. A City of Issaquah representative and/or the consulting professional will make these decisions during construction.

10.6 Planting Notes

Plant in the early spring or late fall and obtain all plants from a reputable nursery. Care and handling of all plant materials is extremely important to the overall success of the project. The origin of all plant materials specified in this plan shall be native plants, nursery grown in the Puget Sound region of Washington. Some limited species substitution may be allowed, only with the agreement of the landscape designer, wetland professional, and/or City staff.

Pre-Planting Meeting
Prior to control of invasive species or installation of mitigation plantings, a site meeting between the contracted landscaper and the consulting wetland professional shall occur to resolve any questions that may arise. During this meeting a discussion regarding plant spacing and locations of plant species including wetland verses buffer species shall occur between the landscape contractor and the consulting wetland professional.

Handling
Plants shall be handled so as to avoid all damage, including: breaking, bruising, root damage, sunburn, drying, freezing or other injury. Plants must be covered during transport. Plants shall not be bound with wire or rope in a manner that could damage branches. Protect plant roots with shade and wet soil in the time period between delivery and installation. Do not lift container stock by trunks, stems, or tops. Do not remove from containers until ready to plant. Water all plants as necessary to keep moisture levels appropriate to the species horticultural requirements. Plants shall not be allowed to dry out. All plants shall be watered thoroughly immediately upon installation. Soak all containerized plants thoroughly prior to installation. Bare root plants are subject to the following special requirements, and shall not be used unless planted between November 1 and March 1, and only with the permission of the landscape designer, wetland professional, and City staff. Bare root plants must have enough fibrous root to ensure plant survival. Roots must be covered at all times with: mud and/or wet straw, moss, or other suitable packing material until time of installation. Plants whose roots have dried out from exposure will not be accepted at installation inspection.

Storage
Plants stored by the Permittee for longer than one month prior to planting shall be planted in nursery rows and treated in a manner suitable to those species' horticultural requirements. Plants must be re-inspected by the wetland professional and/or landscape designer prior to installation.

Damaged plants
Damaged, dried out, or otherwise mishandled plants will be rejected at installation inspection. All rejected plants shall be immediately removed from the site.

Plant Names
Plant names shall comply with those generally accepted in the native plant nursery trade. Any question regarding plant species or variety shall be referred to the landscape designer, wetland professional, or City staff. All plant materials shall be true to species and variety and legibly tagged.

Quality and condition
Plants shall be normal in pattern of growth, healthy, well-branched, vigorous, with well-developed root systems, and free of pests and diseases. Damaged, diseased, pest-infested, scraped, bruised, dried out, burned, broken, or defective plants will be rejected. Plants with pruning wounds over 1-inch in diameter will be rejected.

Roots
All plants shall be balled and burlapped (B &B) or containerized, unless explicitly authorized by the landscape designer and/or wetland professional. Rootbound plants or B&B plants with damaged, cracked, or loose rootballs (major damage) will be rejected. Immediately before installation, plants with minor root damage (some broken and/or twisted roots) must be root-pruned. Matted or circling roots of containerized plantings must be pruned or straightened and the sides of the root ball must be roughened from top to bottom to a depth of approximately half an inch in two to four places. Bare root plantings of woody material are allowed only with permission from the landscape designer, wetland professional and/or City staff.

Sizes
Plant sizes shall be the size indicated in the plant schedule in approved plans. Larger stock may be acceptable provided that it has not been cut back to the size specified, and that the root ball is proportionate to the size of the plant. Smaller stock may be acceptable, and preferable under some circumstances, based on site-specific conditions. Measurements, caliper, branching, and balling and burlapping shall conform to the American Standard of Nursery Stock by the American Association of Nurserymen (latest edition).

Form
Evergreen trees shall have single trunks and symmetrical, well-developed form. Deciduous trees shall be single trunked unless specified as multi-stem in the plant schedule. Shrubs shall have multiple stems and be well-branched.

Timing of Planting
Unless otherwise approved by City staff, all planting shall occur between November 1 and March 1. Overall, the earlier plants go into the ground during the dormant period, the more time they have to adapt to the site and extend their root systems before the water demands of spring and summer.

Weeding
Existing and exotic vegetation in the mitigation areas will be hand-weeded from around all newly installed plants at the time of installation and on a routine basis throughout the monitoring period. No chemical control of vegetation on any portion of the site is recommended.

Site conditions
The contractor shall immediately notify the landscape designer and/or wetland professional of drainage or soil conditions likely to be detrimental to the growth or survival of plants. Planting operations shall not be conducted under the following conditions: freezing weather, when the ground is frozen, excessively wet weather, excessively windy weather, or in excessive heat.

Planting Pits
Planting pits shall be circular or square with vertical sides, and shall be 6" deeper and 12" larger in diameter than the root ball of the plant. Break up the sides of the pit in compacted soils. Set plants upright in pits. Burlap shall be removed from the planting pit. Backfill shall be worked back into holes such that air pockets are removed without adversely compacting down soils.

Fertilizer
Slow release fertilizer may be used if pre-approved by the City of Issaquah staff. Fertilizers shall be applied only at the base of plantings underneath the required covering of mulch (that does not contact stems of the plants). No soil amendment or fertilizers will be placed in planting holes.

Staking
Most shrubs and many trees DO NOT require any staking. If the plant can stand alone without staking in a moderate wind, do not use a stake. If the plant needs support, then strapping or webbing should be used as low as possible on the trunk to loosely brace the tree with two stakes. Do not brace the tree tightly or too high on the trunk. If the tree is unable to sway, it will further lose the ability to support itself. Do not use wire in a rubber hose for strapping as it exerts too much pressure on the bark. As soon as supporting the plant becomes unnecessary, remove the stakes. All stakes must be removed within two (2) years of installation.

Plant Location
Colored surveyors' ribbon or other appropriate marking shall be attached to the installed plants to assist in locating the plants while removing the competing non-native vegetation and during the monitoring period.

Arrangement and Spacing
The plants shall be arranged in a pattern with the appropriate numbers, sizes, species, and distribution that are required in accordance with the approved plans. The actual placement of individual plants shall mimic natural, asymmetric vegetation patterns found on similar undisturbed sites in the area. Spacing of the plantings may be adjusted to maintain existing vegetation with the agreement of the landscape designer, wetland professional, and/or City staff.

Inspection(s)
A wetland professional shall be present on site to inspect the plants prior to planting. Minor adjustments to the original design may be required prior to and during construction.

Woodchip Mulch
After buffer enhancement plant installation, a 36" circle of no less than 2 to 4 inches of organic/untreated woodchips shall be placed around the base of each plant. Woodchips shall be kept well away (at least 2 inches) from the trunks and stems of woody plants.

11.0 FUTURE TRAIL

Per the original Silverado Development Agreement, an easement for a pedestrian trail will be dedicated as part of the proposed development, to potentially provide future trail connections to the larger Squak Mountain trail system.

Many potential trail locations would be located within wetland and stream buffer, which is permissible by IMC 18.10.610(B)(5) and 18.10.775(C), so long as, "*a critical areas study per IMC 18.10.410 documents no loss of buffer functions and values. Additional buffer width equal to the width of the trail tread and the cleared trail shoulders shall be required, except where existing development prevents adding buffer width. In this case, other mitigating measures shall be required to ensure no loss of buffer functions and values.*"

WRI concludes that designation of additional buffer east of Tibbetts Creek would be appropriate mitigation for a future trail within the buffers of on-site critical areas. When considering trail design, WRI recommends that the trail should be located to avoid impacts to trees.

12.0 PERFORMANCE BOND

According to IMC 18.10.810(A), "*…The applicant may post a performance bond equal to one hundred fifty (150) percent of the total cost of the mitigation project to complete, or other security instrument which guarantees that all required mitigation measures will be completed no later than the time established by the City in accordance with this chapter.*"

In addition, according to IMC 18.10.810(B), "*The City shall require the applicant whose development proposal is subject to a mitigation plan to post a maintenance/monitoring bond equal to fifty (50) percent of the estimated maintenance and monitoring cost, or other security instrument in an amount determined sufficient to guarantee satisfactory workmanship, materials, and performance of structures and improvements allowed or required by this chapter for a period of five (5) years.*"

A King County Bond Quantity Worksheet has been completed for the proposed project, and is included in Appendix D. A summary of this worksheet is included below (this does not represent a bid to install):

Plant Materials	$471.50
Installation Costs	$386.00
Erosion Control	$3,923.70
General Items	$29,121.68
Mobilization & Contingency	$13,561.15
Maintenance (5 years)	$1,031.40
Monitoring (5 years)	$4,536.00
Total Estimated Cost	$53,031.43
Total x 150%	**$79,547.145**

13.0 USE OF THIS REPORT

This Critical Area Study is supplied to Steve Burnstead Construction, LLC as a means of determining on-site wetland and stream conditions, as required by Snohomish County 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.

Tess Amen
Associate Ecologist

Meryl Kamowski
Senior Ecologist

15.0 REFERENCES

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APPENDIX A

WETLAND DETERMINATION
DATA FORMS

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WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 7932 Renton-Issaquah Road City/County: Issaquah/King Sampling Date: 11/19/2014

Applicant/Owner: Silverado Care State: WA Sampling Point: S4

Investigator(s): MK and SB Section, Township, Range: S29, T24, R06E

Landform (hillslope, terrace, etc.): slope Local relief (concave, convex, none): _____ Slope (%): ~1

Subregion (LRR): LRR-A Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Everett Gravelly Sandy Loam 5-15 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐ No ☐	**Is the Sampled Area within a Wetland?** Yes ☑ No ☐
Hydric Soil Present?	Yes ☑ No ☐	
Wetland Hydrology Present?	Yes ☑ No ☐	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 15x15)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		

Sapling/Shrub Stratum (Plot size: 15x15)			
1.			
2.			
3.			
4.			
5.			
	15	= Total Cover	

Herb Stratum (Plot size: 15x15)			
1. Agrostis sp.	85	Y	
2. Phallaris arundinacea	25	Y	FAC
3. Ranunclus repens	5	Y	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	115	= Total Cover	

Woody Vine Stratum (Plot size:)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 = 0
FACW species		x 2 = 0
FAC species		x 3 = 0
FACU species		x 4 = 0
UPL species		x 5 = 0
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☐ No ☐

Remarks:

Sample point is in pasture/lawn area. There were no inflorescence for a definite identification.

SOIL

Sampling Point: S4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 2/1	95	7.5YR 4/6	5	C	M	sa lo	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☑ No ☐

Remarks:

minor amount of redoximorphic features at 15" in depth

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ☐	No ☑	Depth (inches): _____
Water Table Present?	Yes ☐	No ☑	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes ☑	No ☐	Depth (inches): 5

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 7932 Renton-Issaquah Road City/County: Issaquah/King Sampling Date: 11/19/2014

Applicant/Owner: Silverado Care State: WA Sampling Point: S2

Investigator(s): MK and SB Section, Township, Range: S29, T24, R06E

Landform (hillslope, terrace, etc.): slope Local relief (concave, convex, none): _____ Slope (%): ~1

Subregion (LRR): LRR-A Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Everett Gravelly Sandy Loam 5-15 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐ No ☐	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐ No ☑	
Wetland Hydrology Present?	Yes ☐ No ☑	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		

Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

Herb Stratum (Plot size:)			
1. Agrostis sp.	90	Y	
2. Ranunculus repens	10	N	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		

Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 = 0
FACW species		x 2 = 0
FAC species		x 3 = 0
FACU species		x 4 = 0
UPL species		x 5 = 0
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☐ No ☐

Remarks:

Sample point is in a pasture/lawn area

SOIL

Sampling Point: S2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/2	100					sa lo	
12-18	2.5Y 4/3	95	7.5YR 4/6					

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☐ No ☑

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

Water Table Present? Yes ☐ No ☑ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☑

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

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 7932 Renton-Issaquah Road City/County: Issaquah/King Sampling Date: 11/19/2014

Applicant/Owner: Silverado Care State: WA Sampling Point: S3

Investigator(s): MK and SV Section, Township, Range: S29, T24, R06E

Landform (hillslope, terrace, etc.): slope Local relief (concave, convex, none): _____ Slope (%): ~1

Subregion (LRR): LRR-A Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Everett Gravelly Sandy Loam 5-15 percent slopes NWI classification: PFOC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☑ No ☐	**Is the Sampled Area within a Wetland?** Yes ☑ No ☐
Hydric Soil Present?	Yes ☑ No ☐	
Wetland Hydrology Present?	Yes ☑ No ☐	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 15x15)	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rubra	20	Y	FAC
2.			
3.			
4.			
	15	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15x15)			
1. Rubus spectabilis	15	Y	FAC
2.			
3.			
4.			
5.			
	15	= Total Cover	
Herb Stratum (Plot size: 15x15)			
1. Agrostis sp.	50	Y	
2. Athyrium felix-femina	15	Y	FAC
3. Ranunclus repens	15	Y	FAC
4. Lotus corniculatus	10	Y	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	90	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 83 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 = 0
FACW species		x 2 = 0
FAC species		x 3 = 0
FACU species		x 4 = 0
UPL species		x 5 = 0
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☑ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

Sample point vegetation plot includes pasture/lawn area and the area with native trees/shrubs. There were no inflorescence for a definite identification.

SOIL

Sampling Point: S3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/2	100					sa lo	
12-18	2.5Y 4/3	95	7.5YR 4/6					

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☑ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

Water Table Present? Yes ☐ No ☑ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): 5

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 7932 Renton-Issaquah Road City/County: Issaquah/King Sampling Date: 11/19/2014

Applicant/Owner: Silverado Care State: WA Sampling Point: S4

Investigator(s): MK and SB Section, Township, Range: S29, T24, R06E

Landform (hillslope, terrace, etc.): slope Local relief (concave, convex, none): _____ Slope (%): ~1

Subregion (LRR): LRR-A Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Everett Gravelly Sandy Loam 5-15 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐ No ☐	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐ No ☑	
Wetland Hydrology Present?	Yes ☐ No ☑	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 15x15)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		

Sapling/Shrub Stratum (Plot size: 15x15)			
1.			
2.			
3.			
4.			
5.			
	15	= Total Cover	

Herb Stratum (Plot size: 15x15)			
1. Agrostis sp.	90	Y	
2. Ranunculus repens	10	Y	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	90	= Total Cover	

Woody Vine Stratum (Plot size:)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 = 0
FACW species		x 2 = 0
FAC species		x 3 = 0
FACU species		x 4 = 0
UPL species		x 5 = 0
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☐ No ☐

Remarks:

Sample point is in pasture/lawn area. There were no inflorescence for a definite identification.

SOIL

Sampling Point: S4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/3	100					sa lo	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☐ No ☑

Remarks:

minor amount of redoximorphic features at 15" in depth

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

Water Table Present? Yes ☐ No ☑ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☑

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

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 7932 Renton-Issaquah Road City/County: Issaquah/King Sampling Date: 11/19/2014

Applicant/Owner: Silverado Care State: WA Sampling Point: S5

Investigator(s): MK and SB Section, Township, Range: S29, T24, R06E

Landform (hillslope, terrace, etc.): slope Local relief (concave, convex, none): _____ Slope (%): ~1

Subregion (LRR): LRR-A Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Mixed Alluvial Land NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐ No ☐	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐ No ☑	
Wetland Hydrology Present?	Yes ☐ No ☑	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 15x15)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		

Sapling/Shrub Stratum (Plot size: 15x15)			
1.			
2.			
3.			
4.			
5.			
	15	= Total Cover	

Herb Stratum (Plot size: 15x15)			
1. Agrostis sp.	70	Y	
2. Poa sp.	30	Y	
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100	= Total Cover	

Woody Vine Stratum (Plot size:)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 = 0
FACW species		x 2 = 0
FAC species		x 3 = 0
FACU species		x 4 = 0
UPL species		x 5 = 0
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☐ No ☐

Remarks:

Sample point is in pasture/lawn area. There were no inflorescence for a definite identification.

SOIL

Sampling Point: S5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/3	100					sa lo	
12-16	10YR 5/2	97	10YR 4/6	3	C	M	sa lo	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☐ No ☑

Remarks:

minor amount of redoximorphic features at 15" in depth

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

Water Table Present? Yes ☐ No ☑ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☑

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

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 7932 Renton-Issaquah Road City/County: Issaquah/King Sampling Date: 11/19/2014

Applicant/Owner: Silverado Care State: WA Sampling Point: S6

Investigator(s): MK and SB Section, Township, Range: S29, T24, R06E

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): LRR-A Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Mixed Alluvial Land NWI classification: PFOC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☑ No ☐	**Is the Sampled Area within a Wetland?** Yes ☑ No ☐
Hydric Soil Present?	Yes ☑ No ☐	
Wetland Hydrology Present?	Yes ☑ No ☐	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 15x15)	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rubra	35	Y	FAC
2.			
3.			
4.			
	35	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15x15)			
1. Rubus spectabilis	25	Y	FAC
2. Rubus armeniacus	10	N	FACU
3.			
4.			
5.			
	35	= Total Cover	

Herb Stratum (Plot size: 15x15)			
1. Phallaris arundinacea	20	Y	FACW
2. Equisetum telmateia	15	Y	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	35	= Total Cover	

Woody Vine Stratum (Plot size:)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 = 0
FACW species		x 2 = 0
FAC species		x 3 = 0
FACU species		x 4 = 0
UPL species		x 5 = 0
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☑ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: S6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 2/2	100					sa lo	
6-16	10YR 2/2	95	10YR 3/6	5	C	M	sa cl lo	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☑ No ☐

Remarks:

minor amount of redoximorphic features at 15" in depth

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

Water Table Present? Yes ☐ No ☑ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): 11

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 7932 Renton-Issaquah Road City/County: Issaquah/King Sampling Date: 11/19/2014

Applicant/Owner: Silverado Care State: WA Sampling Point: S7

Investigator(s): MK and SB Section, Township, Range: S29, T24, R06E

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): LRR-A Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Mixed Alluvial Land NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐ No ☑	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐ No ☑	
Wetland Hydrology Present?	Yes ☐ No ☑	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 15x15)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	35	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15x15)	Absolute % Cover	Dominant Species?	Indicator Status
1. Rubus lacinatus	50	Y	FAC
2. Corylus cornuta	25	Y	FACU
3. Ilex aquifolium	15	Y	FACU
4.			
5.			
	90	= Total Cover	

Herb Stratum (Plot size: 15x15)	Absolute % Cover	Dominant Species?	Indicator Status
1. Ranunculus repens	20	Y	FAC
2. Equisetum telmateia	15	Y	FACW
3. Phallaris arundinacea	10	Y	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	45	= Total Cover	

Woody Vine Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 83 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 = 0
FACW species		x 2 = 0
FAC species		x 3 = 0
FACU species		x 4 = 0
UPL species		x 5 = 0
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☑ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: S7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/3	100					sa lo	
12-16	10YR 3/3	97	10YR 3/6	3	C	M	sa cl lo	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☐ No ☑

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

Water Table Present? Yes ☐ No ☑ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☑

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

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Silverado - Renton-Issaquah Road SE City/County: Issaquah/King County Sampling Date: 6/14/2017

Applicant/Owner: Steve Burnstead Construction, LLC State: WA Sampling Point: S8

Investigator(s): Meryl Kamowski, Tess Amen Section, Township, Range: S29-T24N-R06E-WM

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): None

Subregion (LRR): LRR-A Lat: 47.531238 Long: -122.059902 Datum: NAD83

Soil Map Unit Name: Mixed Alluvial Land NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☑ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☑ No ☐	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐ No ☑	
Wetland Hydrology Present?	Yes ☐ No ☑	

Remarks:

Dense equisetum hyemale area adjacent to Tibbetts Creek. The period prior to the site visit (March-May) was wetter than normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5m^2)	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rubra	80	Y	FAC
2.			
3.			
4.			
	80	= Total Cover	

Sapling/Shrub Stratum (Plot size: 3m^2)			
1. Rubus armeniacus	50	Y	FACU
2. Rubus spectabilis	15	Y	FAC
3.			
4.			
5.			
	65	= Total Cover	

Herb Stratum (Plot size: 1m^2)			
1. Equisetum hyemale	80	Y	FACW
2. Polystichum munitum	15	N	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	95	= Total Cover	

Woody Vine Stratum (Plot size:)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 5

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 = 0
FACW species		x 2 = 0
FAC species		x 3 = 0
FACU species		x 4 = 0
UPL species		x 5 = 0
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☑ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: S8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/2	100					Silty Loam	
6-16	10YR 3/4	100					Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☐ No ☑

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

Water Table Present? Yes ☐ No ☑ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☑

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

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Silverado - Renton-Issaquah Road SE City/County: Issaquah/King County Sampling Date: 6/14/2017

Applicant/Owner: Steve Burnstead Construction, LLC State: WA Sampling Point: S9

Investigator(s): Meryl Kamowski, Tess Amen Section, Township, Range: S29-T24N-R06E-WM

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): None

Subregion (LRR): LRR-A Lat: 47.531238 Long: -122.059902 Datum: NAD83

Soil Map Unit Name: Mixed Alluvial Land NWI classification: PFOC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☑ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☑ No ☐	**Is the Sampled Area within a Wetland?** Yes ☑ No ☐
Hydric Soil Present?	Yes ☑ No ☐	
Wetland Hydrology Present?	Yes ☑ No ☐	

Remarks:

In Wetland D by WRD1. The period prior to the site visit (March-May 2017) was wetter than normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5m^2)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0	= Total Cover	

Sapling/Shrub Stratum (Plot size: 3m^2)	Absolute % Cover	Dominant Species?	Indicator Status
1. Rubus armeniacus	80	Y	FAC
2. Salix lasiandra	25	Y	FACW
3. Sambucus racemosa	15	N	FACU
4.			
5.			
	120	= Total Cover	

Herb Stratum (Plot size: 1m^2)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	0	= Total Cover	

Woody Vine Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 100

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 = 0
FACW species	25	x 2 = 50
FAC species	80	x 3 = 240
FACU species	15	x 4 = 60
UPL species		x 5 = 0
Column Totals:	120 (A)	350 (B)

Prevalence Index = B/A = 2.9

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☐ Dominance Test is >50%
- ☑ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☐ No ☑

Remarks:

SOIL

Sampling Point: S9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/2	95	7.5YR 4/4	5	C	M	Sandy Clay Loam	
6-16	2.5Y 5/2	75	7.5YR 5/6	25	C	M	Sandy Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☑ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☑ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

Water Table Present? Yes ☐ No ☑ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): 12"

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Silverado - Renton-Issaquah Road SE City/County: Issaquah/King County Sampling Date: 6/14/2017

Applicant/Owner: Steve Burnstead Construction, LLC State: WA Sampling Point: S10

Investigator(s): Meryl Kamowski, Tess Amen Section, Township, Range: S29-T24N-R06E-WM

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None Slope (%): ~6%

Subregion (LRR): LRR-A Lat: 47.531238 Long: -122.059902 Datum: NAD83

Soil Map Unit Name: Mixed Alluvial Land NWI classification: PFOC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☑ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☑ No ☐	**Is the Sampled Area within a Wetland?** Yes ☑ No ☐
Hydric Soil Present?	Yes ☐ No ☑	
Wetland Hydrology Present?	Yes ☑ No ☐	

Remarks:

In Wetland E. The period prior to the site visit (March-May) was wetter than normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5m^2)	Absolute % Cover	Dominant Species?	Indicator Status
1. Thuja plicata	60	Y	FAC
2. Alnus rubra	35	Y	FAC
3.			
4.			
	95	= Total Cover	
Sapling/Shrub Stratum (Plot size: 3m^2)			
1. Rubus spectabilis	30	Y	FAC
2.			
3.			
4.			
5.			
	30	= Total Cover	
Herb Stratum (Plot size: 1m^2)			
1. Tolmiea menziesii	15	Y	FAC
2. Polystichum munitum	5	Y	FACU
3. Athyrium filix-femina	Trace	N	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	20	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 80

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 = 0
FACW species		x 2 = 0
FAC species		x 3 = 0
FACU species		x 4 = 0
UPL species		x 5 = 0
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☑ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: S10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 2/1	100					Sandy Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☐ No ☑

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ☐	No ☑	Depth (inches): _____
Water Table Present?	Yes ☑	No ☐	Depth (inches): Surface
Saturation Present? (includes capillary fringe)	Yes ☑	No ☐	Depth (inches): Surface

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Silverado - Renton-Issaquah Road SE City/County: Issaquah/King County Sampling Date: 6/14/2017

Applicant/Owner: Steve Burnstead Construction, LLC State: WA Sampling Point: S11

Investigator(s): Meryl Kamowski, Tess Amen Section, Township, Range: S29-T24N-R06E-WM

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None Slope (%): ~6%

Subregion (LRR): LRR-A Lat: 47.531238 Long: -122.059902 Datum: NAD83

Soil Map Unit Name: Mixed Alluvial Land NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☑ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐ No ☑	**Is the Sampled Area within a Wetland?** Yes ☐ No ☐
Hydric Soil Present?	Yes ☐ No ☑	
Wetland Hydrology Present?	Yes ☐ No ☐	

Remarks:

Wetland E Out. The period prior to the site visit (March-May) was wetter than normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Thuja plicata	40	Y	FAC
2. Tsuga heterophylla	15	Y	FACU
3.			
4.			
	55	= Total Cover	

Sapling/Shrub Stratum (Plot size: 3m)			
1. Vaccinium parvifolium	5	Y	FACU
2. Rubus spectabilis	5	Y	FAC
3.			
4.			
5.			
	10	= Total Cover	

Herb Stratum (Plot size: 1m)			
1. Polystichum munitum	15	Y	FACU
2. Achlys triphylla	5	Y	UPL
3. Athyrium filix-femina	5	Y	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	25	= Total Cover	

Woody Vine Stratum (Plot size:)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 75

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 43% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 = 0
FACW species		x 2 = 0
FAC species	50	x 3 = 150
FACU species	35	x 4 = 140
UPL species	5	x 5 = 25
Column Totals:	90 (A)	315 (B)

Prevalence Index = B/A = 3.5

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☐ No ☑

Remarks:

SOIL

Sampling Point: S11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 2/2	100					Sandy Clay Loam	
5-16	10YR 3/3	100					Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☐ No ☑

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

Water Table Present? Yes ☐ No ☑ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☑

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

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Silverado - Renton-Issaquah Road SE City/County: Issaquah/King County Sampling Date: 6/14/2017

Applicant/Owner: Silverado Care State: WA Sampling Point: S12

Investigator(s): Meryl Kamowski, Tess Amen Section, Township, Range: S29-T24N-R06E-WM

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): None

Subregion (LRR): LRR-A Lat: 47.531238 Long: -122.059902 Datum: NAD83

Soil Map Unit Name: Mixed Alluvial Land NWI classification: PFOC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☑ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☑ No ☐	**Is the Sampled Area within a Wetland?** Yes ☑ No ☐
Hydric Soil Present?	Yes ☑ No ☐	
Wetland Hydrology Present?	Yes ☑ No ☐	

Remarks:

In Wetland F. The period prior to the site visit (March-May) was wetter than normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5m^2)	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rubra	40	Y	FAC
2.			
3.			
4.			
	40	= Total Cover	

Sapling/Shrub Stratum (Plot size: 3m^2)			
1. Rubus spectabilis	40	Y	FAC
2.			
3.			
4.			
5.			
	40	= Total Cover	

Herb Stratum (Plot size: 1m^2)			
1. Equisetum hyemale	60	Y	FACW
2. Phalaris arundinacea	40	Y	FACW
3. Tolmiea menziesii	Trace	N	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100	= Total Cover	

Woody Vine Stratum (Plot size:)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 = 0
FACW species		x 2 = 0
FAC species		x 3 = 0
FACU species		x 4 = 0
UPL species		x 5 = 0
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☑ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: S12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/1	95	7.5YR 3/4	5	C	M	Sa Cl Lo	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☑ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ☐	No ☑	Depth (inches): _____
Water Table Present?	Yes ☑	No ☐	Depth (inches): Surface
Saturation Present? (includes capillary fringe)	Yes ☑	No ☐	Depth (inches): Surface

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks:

APPENDIX B

WETLAND RATING FORMS

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Wetland name or number Wet A

WETLAND RATING FORM – WESTERN WASHINGTON
Version 2 - Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): Silverado - Wetland A Date of site visit: 11/19/14

Rated by MK Trained by Ecology? Yes ☑ No ☐ Date of training 04/13

SEC: 29 TWNSHP: 24 RNGE: 06 Is S/T/R in Appendix D? Yes ☐ No ☑

Map of wetland unit: Figure ____ Estimated size 1,200 square feet

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I ___ **II** ___ **III** ___ **IV** ✔

Category I = Score >=70
Category II = Score 51-69
Category III = Score 30-50
Category IV = Score < 30

Score for Water Quality Functions	10
Score for Hydrologic Functions	10
Score for Habitat Functions	9
TOTAL score for Functions	29

Category based on SPECIAL CHARACTERISTICS of wetland

I ___ **II** ___ **Does not Apply** ✔

Final Category (choose the "highest" category from above) IV

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	✔
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	✔	Check if unit has multiple HGM classes present	☐

Wetland name or number Wet A

Does the wetland unit being rated meet any of the criteria below?

If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered* ***animal or plant*** *species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.		✔
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered* ***animal*** *species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category I Natural Heritage Wetlands (see p. 19 of data form).		✔
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*		✔
SP4. *Does the wetland unit have a local significance in addition to its functions*? For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.		✔

To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Wetland name or number Wet A

Classification of Wetland Units in Western Washington

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
☑ NO – go to 2 ☐ **YES** – the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe** ☐ **NO – Saltwater Tidal Fringe (Estuarine)** ☐

*If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is rated as an **Estuarine** wetland.* Wetlands that were called estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p.).

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
☑ NO – go to 3 ☐ **YES** – The wetland class is **Flats**

If your wetland can be classified as a "Flats" wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet both** of the following criteria?
___The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) at least 20 acres (8 ha) in size;
___At least 30% of the open water area is deeper than 6.6 ft (2 m)?
☑ NO – go to 4 ☐ **YES –** The wetland class is **Lake-fringe (Lacustrine Fringe)**

4. Does the entire wetland unit **meet all** of the following criteria?
___✔___The wetland is on a slope (*slope can be very gradual*),
___✔___The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
___✔___The water leaves the wetland **without being impounded**?
NOTE: *Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than 1 foot deep).*
☐ NO - go to 5 ☑ **YES –** The wetland class is **Slope**

Wetland name or number Wet A

5. Does the entire wetland unit **meet all** of the following criteria?

____ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river

____ The overbank flooding occurs at least once every two years.

NOTE: The riverine unit can contain depressions that are filled with water when the river is not flooding.

☐ NO - go to 6 ☐ **YES** – The wetland class is **Riverine**

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

☐ NO – go to 7 ☐ **YES –** The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding. The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

☐ NO – go to 8 ☐ **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within your wetland. NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM Classes within the wetland unit being rated	*HGM Class to Use in Rating*
Slope + Riverine ☐	Riverine ☐
Slope + Depressional ☐	Depressional ☐
Slope + Lake-fringe ☐	Lake-fringe ☐
Depressional + Riverine along stream within boundary ☐	Depressional ☐
Depressional + Lake-fringe ☐	Depressional ☐
Salt Water Tidal Fringe and any other class of freshwater wetland ☐	Treat as ESTUARINE under wetlands with special characteristics ☐

If you are unable still to determine which of the above criteria apply to your wetland, or if you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

Wetland name or number Wet A

S	**Slope Wetlands** WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality	**Points** (only 1 score per box)
S	**S 1. Does the wetland unit have the <u>potential</u> to improve water quality?**	***(see p.64)***
S	S 1.1 Characteristics of average slope of unit: ☐ Slope is1% or less *(a 1% slope has a 1 foot vertical drop in elevation for every 100 ft horizontal distance*) points = 3 ☑ Slope is 1% - 2% points = 2 ☐ Slope is 2% - 5% points = 1 ☐ Slope is greater than 5% points = 0	2
S	S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic *(use NRCS definitions)* ☐ YES = 3 points ☑ NO = 0 points	0
S	S 1.3 Characteristics of the vegetation in the wetland that trap sediments and pollutants: *Choose the points appropriate for the description that best fits the vegetation in the wetland. Dense vegetation means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 inches.* ☐ Dense, uncut, herbaceous vegetation > 90% of the wetland area points = 6 ☑ Dense, uncut, herbaceous vegetation > 1/2 of area points = 3 ☐ Dense, woody, vegetation > ½ of area points = 2 ☐ Dense, uncut, herbaceous vegetation > 1/4 of area points = 1 ☐ Does not meet any of the criteria above for vegetation points = 0 Aerial photo or map with vegetation polygons	**Figure** ___ 3
S	**Total for S 1** *Add the points in the boxes above*	5
S	**S 2. Does the wetland unit have the <u>opportunity</u> to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ☐ Grazing in the wetland or within 150ft ☐ Untreated stormwater discharges to wetland ☐ Tilled fields, logging, or orchards within 150 feet of wetland ☑ Residential, urban areas, or golf courses are within 150 ft upslope of wetland ☐ Other_____ ☑ **YES** multiplier is **2** ☐ **NO** multiplier is **1**	***(see p.67)*** multiplier 2
S	**TOTAL - Water Quality Functions** Multiply the score from S1 by S2 ***Add score to table on p. 1***	10

Comments

Wetland name or number Wet A

S	**Slope Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream erosion	**Points** (only 1 score per box)
	S 3. Does the wetland unit have the <u>potential</u> to reduce flooding and stream erosion?	***(see p.68)***
S	S 3.1 Characteristics of vegetation that reduce the velocity of surface flows during storms. *Choose the points appropriate for the description that best fit conditions in the wetland. (stems of plants should be thick enough (usually > 1/8in), or dense enough, to remain erect during surface flows)* ☐ Dense, uncut, **rigid** vegetation covers > 90% of the area of the wetland. points = 6 ☑ Dense, uncut, **rigid** vegetation > 1/2 area of wetland points = 3 ☐ Dense, uncut, **rigid** vegetation > 1/4 area points = 1 ☐ More than 1/4 of area is grazed, mowed, tilled or vegetation is not rigid points = 0	3
S	S 3.2 Characteristics of slope wetland that holds back small amounts of flood flows: The slope wetland has small surface depressions that can retain water over at least 10% of its area. ☑ YES points = 2 ☐ NO points = 0	2
S	*Add the points in the boxes above*	5
S	**S 4. Does the wetland have the <u>opportunity</u> to reduce flooding and erosion?** Is the wetland in a landscape position where the reduction in water velocity it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows? *Note which of the following conditions apply.* ☑ Wetland has surface runoff that drains to a river or stream that has flooding problems ☐ Other_____ *(Answer NO if the major source of water is controlled by a reservoir (e.g. wetland is a seep that is on the downstream side of a dam)* ☑ **YES** multiplier is **2** ☐ **NO** multiplier is **1**	***(see p. 70)*** multiplier 2
S	**TOTAL - Hydrologic Functions** Multiply the score from S 3 by S 4 ***Add score to table on p. 1***	10

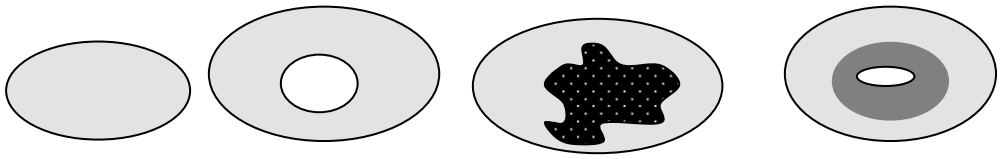
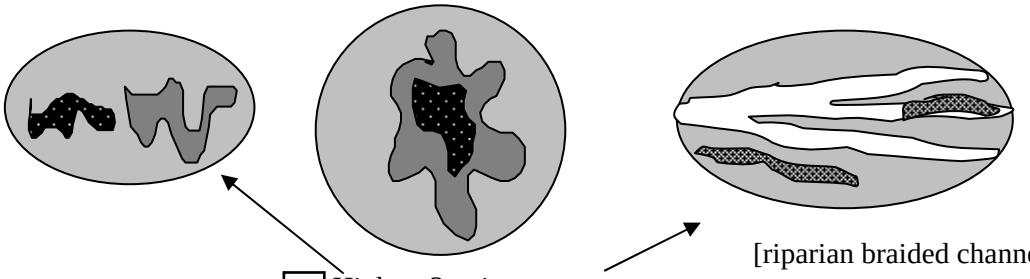
Comments

Wetland name or number Wet A

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit have the <u>potential</u> to provide habitat for many species?	
H 1.1 <u>Vegetation structure</u> ***(see p. 72)*** *Check the types of vegetation classes present (as defined by Cowardin)- Size threshold for each class is ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.* ☐ Aquatic bed ☑ Emergent plants ☐ Scrub/shrub (areas where shrubs have >30% cover) ☐ Forested (areas where trees have >30% cover) *If the unit has a forested class check if:* ☐ The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation structures that qualify. If you have:* ☐ 4 structures or more points = 4 ☐ 3 structures points = 2 ☐ 2 structures points = 1 ☑ 1 structure points = 0 Map of Cowardin vegetation classes	**Figure ___** 0
H 1.2. <u>Hydroperiods</u> ***(see p. 73)*** *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ☐ Permanently flooded or inundated — ☐ 4 or more types present points = 3 ☐ Seasonally flooded or inundated — ☐ 3 types present points = 2 ☐ Occasionally flooded or inundated — ☐ 2 types present point = 1 ☑ Saturated only — ☑ 1 type present points = 0 ☐ Permanently flowing stream or river in, or adjacent to, the wetland ☐ Seasonally flowing stream in, or adjacent to, the wetland ☐ ***Lake-fringe wetland* = 2 points** ☐ ***Freshwater tidal wetland* = 2 points** Map of hydroperiods	**Figure ___** 0
H 1.3. <u>Richness of Plant Species</u> ***(see p. 75)*** Count the number of plant species in the wetland that cover at least 10 ft^2. (*different patches of the same species can be combined to meet the size threshold)* *You do not have to name the species.* *Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle* If you counted: ☐ > 19 species points = 2 *List species below if you want to:* ☑ 5 - 19 species points = 1 ☐ < 5 species points = 0	1

Total for page 1

Wetland name or number Wet A

H 1.4. Interspersion of habitats ***(see p. 76)*** Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  ☑ None = 0 points ☐ Low = 1 point ☐ Moderate = 2 points  [riparian braided channels] ☐ High = 3 points NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes	**Figure ___** 0
H 1.5. Special Habitat Features: ***(see p. 77)*** *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ☐ Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). ☐ Standing snags (diameter at the bottom > 4 inches) in the wetland ☐ Undercut banks are present for at least 6.6 ft (2m) and/or overhanging vegetation extends at least 3.3 ft (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft (10m) ☐ Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* ☐ At least ¼ acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated.*(structures for egg-laying by amphibians)* ☐ Invasive plants cover less than 25% of the wetland area in each stratum of plants *NOTE: The 20% stated in early printings of the manual on page 78 is an error.*	0
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	1

Comments

Wetland name or number Wet A

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
H 2.1 Buffers ***(see p. 80)*** *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."* ☐ 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer**.** (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** ☐ 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** ☐ 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** ☐ 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** ☐ 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** ☐ No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** ☑ No paved areas or buildings within 50m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** ☐ Heavy grazing in buffer. **Points = 1** ☐ Vegetated buffers are <2m wide (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0**. ☐ Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	**Figure ___** 2
H 2.2 Corridors and Connections ***(see p. 81)*** H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft wide, has at least 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? (*dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor*). ☐ YES = **4 points** (*go to H 2.3*) ☐ NO = go to H 2.2.2 H 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? ☐ YES = **2 points** (*go to H 2.3*) ☐ NO = H 2.2.3 H 2.2.3 Is the wetland: ☐ within 5 mi (8km) of a brackish or salt water estuary OR ☐ within 3 mi of a large field or pasture (>40 acres) OR ☐ within 1 mi of a lake greater than 20 acres? ☐ YES = **1 point** ☑ NO = **0 points**	0

Total for page 2

Wetland name or number Wet A

H 2.3 Near or adjacent to other priority habitats listed by WDFW ***(see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report http://wdfw.wa.gov/hab/phslist.htm)*** Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* ☐ **Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre). ☐ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report p. 152*). ☐ **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock. ☐ **Old-growth/Mature forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age. **(**Mature forests) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest. ☐ **Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158*). ☑ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other. ☐ **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161*). ☑ **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources. ☐ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report: pp. 167-169 and glossary in Appendix A).* ☐ **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human. ☐ **Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft. ☐ **Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ☐ **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long. ☐ If wetland has **3 or more** priority habitats **= 4 points** ☑ If wetland has **2** priority habitats = **3 points** ☐ If wetland has **1** priority habitat **= 1 point** ☐ No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	3

Wetland name or number Wet A

H 2.4 Wetland Landscape *(choose the **one** description of the landscape around the wetland that best fits)* ***(see p. 84)*** ☐ There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 ☐ The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 ☑ There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 ☐ The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 ☐ There is at least 1 wetland within ½ mile. points = 2 ☐ There are no wetlands within ½ mile. points = 0	3
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	8
TOTAL for H 1 from page 14	1
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	9

Wetland name or number Wet A

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate answers and Category.

Wetland Type *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	**Category**
SC 1.0 Estuarine wetlands *(see p. 86)* Does the wetland unit meet the following criteria for Estuarine wetlands? ☐ The dominant water regime is tidal, ☐ Vegetated, and ☐ With a salinity greater than 0.5 ppt. ☐ YES = Go to SC 1.1 NO ☑ =Go to SC 2.0	
SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? ☐ YES = Category I ☐ NO go to SC 1.2	**Cat. I** ☐
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three conditions? ☐ YES = Category I ☐ NO = Category II ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native *Spartina* spp. are the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. ☐ The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	☐ **Cat. I** ☐ **Cat. II** ☐ **Dual rating I/II**

Wetland name or number Wet A

SC 2.0 Natural Heritage Wetlands ***(see p. 87)*** Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? *(this question is used to screen out most sites before you need to contact WNHP/DNR)* S/T/R information from Appendix D [✔] or accessed from WNHP/DNR web site [ ] YES [ ] – contact WNHP/DNR (see p. 79) and go to SC 2.2 NO [✔] SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? [ ] YES = Category I NO [✔] not a Heritage Wetland	[ ] **Cat. I**
SC 3.0 Bogs ***(see p. 87)*** Does the wetland unit (**or any part of the unit**) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 [ ] [✔] No - go to Q. 2 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? [ ] Yes - go to Q. 3 [✔] No - Is not a bog for purpose of rating 3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)? [ ] Yes – Is a bog for purpose of rating [ ] No - go to Q. 4 NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. [ ] YES = Category I No [ ] Is not a bog for purpose of rating	[ ] **Cat. I**

Wetland name or number Wet A

SC 4.0 Forested Wetlands *(see p. 90)* Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *If you answer yes you will still need to rate the wetland based on its functions.* ☐ **Old-growth forests**: (west of Cascade crest) Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm) or more. NOTE: The criterion for dbh is based on measurements for upland forests. Two-hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The DFW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter. ☐ **Mature forests**: (west of the Cascade Crest) Stands where the largest trees are 80 – 200 years old OR have average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth. ☐ YES = Category I NO ☑ not a forested wetland with special characteristics	**Cat. I** ☐
SC 5.0 Wetlands in Coastal Lagoons *(see p. 91)* Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? ☐ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks ☐ The lagoon in which the wetland is located contains surface water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* ☐ YES = Go to SC 5.1 NO ☑ not a wetland in a coastal lagoon SC 5.1 Does the wetland meets all of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of invasive plant species (see list of invasive species on p. 74). ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. ☐ The wetland is larger than 1/10 acre (4350 square feet) ☐ YES = Category I ☐ NO = Category II	☐ **Cat. I** ☐ **Cat. II**

Wetland name or number Wet A

SC 6.0 Interdunal Wetlands ***(see p. 93)*** Is the wetland unit west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ☐ YES - go to SC 6.1 NO ☑ not an interdunal wetland for rating ***If you answer yes you will still need to rate the wetland based on its functions.*** In practical terms that means the following geographic areas: ☐ Long Beach Peninsula- lands west of SR 103 ☐ Grayland-Westport- lands west of SR 105 ☐ Ocean Shores-Copalis- lands west of SR 115 and SR 109 SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is once acre or larger? ☐ YES = Category II ☐ NO – go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? ☐ YES = Category III	**Cat. II** ☐ **Cat. III** ☐
Category of wetland based on Special Characteristics *Choose the "highest" rating if wetland falls into several categories, and record on p. 1.* If you answered NO for all types enter "Not Applicable" on p.1	☐ Cat. I ☐ Cat. II ☐ Cat. III ☑ N/A

Wetland name or number WET B

WETLAND RATING FORM – WESTERN WASHINGTON
Version 2 - Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): Silverado - Wetland B Date of site visit: 11/19/14

Rated by MK Trained by Ecology? Yes ☑ No ☐ Date of training 04/13

SEC: 29 TWNSHP: 24 RNGE: 06E Is S/T/R in Appendix D? Yes ☐ No ☑

Map of wetland unit: Figure ____ Estimated size ~1 acre

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I ___ **II** ___ **III** ✔ **IV** ___

Category I = Score >=70
Category II = Score 51-69
Category III = Score 30-50
Category IV = Score < 30

Score for Water Quality Functions	14
Score for Hydrologic Functions	10
Score for Habitat Functions	17
TOTAL score for Functions	41

Category based on SPECIAL CHARACTERISTICS of wetland

I ___ **II** ___ **Does not Apply** ___

Final Category (choose the "highest" category from above) III

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	✔
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	✔	Check if unit has multiple HGM classes present	✔

Wetland name or number WET B

Does the wetland unit being rated meet any of the criteria below?

If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered* ***animal or plant*** *species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.		✔
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered* ***animal*** *species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category I Natural Heritage Wetlands (see p. 19 of data form).		✔
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*		✔
SP4. *Does the wetland unit have a local significance in addition to its functions*? For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.		✔

To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Wetland name or number WET B

Classification of Wetland Units in Western Washington

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
☑ NO – go to 2 ☐ **YES** – the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe** ☐ **NO – Saltwater Tidal Fringe (Estuarine)** ☐

*If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is rated as an **Estuarine** wetland.* Wetlands that were called estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p.).

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
☑ NO – go to 3 ☐ **YES** – The wetland class is **Flats**

If your wetland can be classified as a "Flats" wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet both** of the following criteria?
___The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) at least 20 acres (8 ha) in size;
___At least 30% of the open water area is deeper than 6.6 ft (2 m)?
☑ NO – go to 4 ☐ **YES –** The wetland class is **Lake-fringe (Lacustrine Fringe)**

4. Does the entire wetland unit **meet all** of the following criteria?
_✔_The wetland is on a slope (*slope can be very gradual*),
____The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
____The water leaves the wetland **without being impounded**?
NOTE: *Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than 1 foot deep).*
☑ NO - go to 5 ☐ **YES –** The wetland class is **Slope**

Wetland name or number WET B

5. Does the entire wetland unit **meet all** of the following criteria?

____ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river

____ The overbank flooding occurs at least once every two years.

NOTE: The riverine unit can contain depressions that are filled with water when the river is not flooding.

☑ NO - go to 6 ☐ **YES** – The wetland class is **Riverine**

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

☐ NO – go to 7 ☑ **YES –** The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding. The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

☐ NO – go to 8 ☐ **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within your wetland. NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM Classes within the wetland unit being rated		*HGM Class to Use in Rating*	
Slope + Riverine	☐	Riverine	☐
Slope + Depressional	☐	Depressional	☑
Slope + Lake-fringe	☐	Lake-fringe	☐
Depressional + Riverine along stream within boundary	☐	Depressional	☐
Depressional + Lake-fringe	☐	Depressional	☐
Salt Water Tidal Fringe and any other class of freshwater wetland	☐	Treat as ESTUARINE under wetlands with special characteristics	☐

If you are unable still to determine which of the above criteria apply to your wetland, or if you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

Wetland name or number WET B

D	**Depressional and Flats Wetlands** **WATER QUALITY FUNCTIONS** - Indicators that the wetland unit functions to improve water quality	**Points** (only 1 score per box)
D	**D 1. Does the wetland unit have the <u>potential</u> to improve water quality?**	***(see p.38)***
D	D 1.1 Characteristics of surface water flows out of the wetland: ☐ Unit is a depression with no surface water leaving it (no outlet) points = 3 ☑ Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2 ☐ Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) points = 1 ☐ Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch points = 1 (*If ditch is not permanently flowing treat unit as "intermittently flowing"*) Provide photo or drawing	**Figure** ___ 2
D	S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic *(use NRCS definitions)* ☐ YES points = 4 ☑ NO points = 0	0
D	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class) ☑ Wetland has persistent, ungrazed, vegetation > = 95% of area points = 5 ☐ Wetland has persistent, ungrazed, vegetation > = 1/2 of area points = 3 ☐ Wetland has persistent, ungrazed vegetation > = 1/10 of area points = 1 ☐ Wetland has persistent, ungrazed vegetation <1/10 of area points = 0 Map of Cowardin vegetation classes	**Figure** ___ 5
D	D1.4 Characteristics of seasonal ponding or inundation. *This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.* ☐ Area seasonally ponded is > ½ total area of wetland points = 4 ☐ Area seasonally ponded is > ¼ total area of wetland points = 2 ☑ Area seasonally ponded is < ¼ total area of wetland points = 0 Map of Hydroperiods	**Figure** ___ 0
D	**Total for D 1** *Add the points in the boxes above*	7
D	**D 2. Does the wetland unit have the <u>opportunity</u> to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ☐ Grazing in the wetland or within 150 ft ☐ Untreated stormwater discharges to wetland ☐ Tilled fields or orchards within 150 ft of wetland ☐ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging ☑ Residential, urban areas, golf courses are within 150 ft of wetland ☐ Wetland is fed by groundwater high in phosphorus or nitrogen ☐ Other_____ ☑ **YES** multiplier is **2** ☐ **NO** multiplier is **1**	***(see p. 44)*** multiplier 2
D	**<u>TOTAL</u> - Water Quality Functions** Multiply the score from D1 by D2 ***Add score to table on p. 1***	14

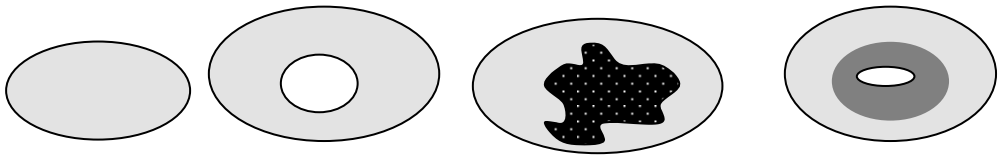
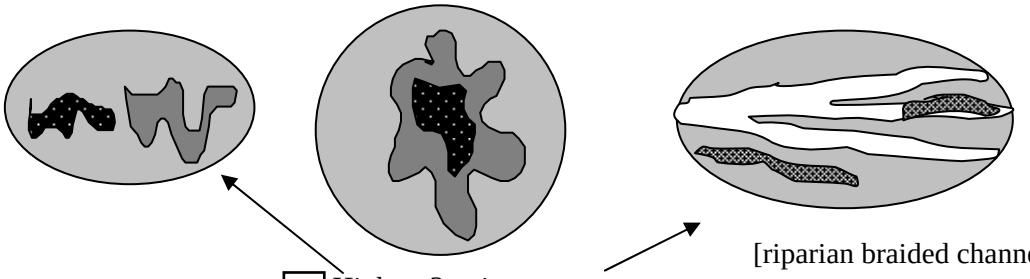
Wetland name or number WET B

D	**Depressional and Flats Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation	**Points** (only 1 score per box)
	D 3. Does the wetland unit have the <u>potential</u> to reduce flooding and erosion?	***(see p.46)***
D	D 3.1 Characteristics of surface water flows out of the wetland unit ☐ Unit is a depression with no surface water leaving it (no outlet) points = 4 ☑ Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2 ☐ Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch points = 1 (*If ditch is not permanently flowing treat unit as "intermittently flowing"*) ☐ Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) points = 0	2
D	D 3.2 Depth of storage during wet periods *Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).* ☐ Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7 ☐ The wetland is a "headwater" wetland" points = 5 ☐ Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5 ☐ Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3 ☐ Unit is flat (yes to Q. 2 or Q. 7 on key) but has small depressions on the surface that trap water points = 1 ☑ Marks of ponding less than 0.5 ft points = 0	0
D	D 3.3 Contribution of wetland unit to storage in the watershed *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* ☐ The area of the basin is less than 10 times the area of unit points = 5 ☑ The area of the basin is 10 to 100 times the area of the unit points = 3 ☐ The area of the basin is more than 100 times the area of the unit points = 0 ☐ Entire unit is in the FLATS class points = 5	3
D	**Total for D 3** *Add the points in the boxes above*	5
D	**D 4. Does the wetland unit have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* ☐ Wetland is in a headwater of a river or stream that has flooding problems ☑ Wetland drains to a river or stream that has flooding problems ☐ Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems ☐ Other_____ ☑ **YES** multiplier is **2** ☐ **NO** multiplier is **1**	***(see p. 49)*** multiplier 2
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 ***Add score to table on p. 1***	10

Wetland name or number WET B

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit have the <u>potential</u> to provide habitat for many species?	
H 1.1 <u>Vegetation structure</u> ***(see p. 72)*** *Check the types of vegetation classes present (as defined by Cowardin)- Size threshold for each class is ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.* ☐ Aquatic bed ☑ Emergent plants ☐ Scrub/shrub (areas where shrubs have >30% cover) ☑ Forested (areas where trees have >30% cover) *If the unit has a forested class check if:* ☑ The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation structures that qualify. If you have:* ☐ 4 structures or more points = 4 ☑ 3 structures points = 2 ☐ 2 structures points = 1 ☐ 1 structure points = 0 Map of Cowardin vegetation classes	**Figure ___** 2
H 1.2. <u>Hydroperiods</u> ***(see p. 73)*** *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ☐ Permanently flooded or inundated ☐ Seasonally flooded or inundated ☑ Occasionally flooded or inundated ☑ Saturated only ☐ 4 or more types present points = 3 ☑ 3 types present points = 2 ☐ 2 types present point = 1 ☐ 1 type present points = 0 ☐ Permanently flowing stream or river in, or adjacent to, the wetland ☑ Seasonally flowing stream in, or adjacent to, the wetland ☐ ***Lake-fringe wetland* = 2 points** ☐ ***Freshwater tidal wetland* = 2 points** Map of hydroperiods	**Figure ___** 2
H 1.3. <u>Richness of Plant Species</u> ***(see p. 75)*** Count the number of plant species in the wetland that cover at least 10 ft^2. (*different patches of the same species can be combined to meet the size threshold)* *You do not have to name the species.* *Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle* If you counted: ☐ > 19 species points = 2 ☑ 5 - 19 species points = 1 ☐ < 5 species points = 0 *List species below if you want to:*	1

Total for page 5

H 1.4. Interspersion of habitats ***(see p. 76)*** Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  ☐ None = 0 points ☐ Low = 1 point ☑ Moderate = 2 points  [riparian braided channels] ☐ High = 3 points NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes	**Figure ___** 2
H 1.5. Special Habitat Features: ***(see p. 77)*** *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ☑ Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). ☑ Standing snags (diameter at the bottom > 4 inches) in the wetland ☐ Undercut banks are present for at least 6.6 ft (2m) and/or overhanging vegetation extends at least 3.3 ft (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft (10m) ☐ Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* ☐ At least ¼ acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated.*(structures for egg-laying by amphibians)* ☐ Invasive plants cover less than 25% of the wetland area in each stratum of plants *NOTE: The 20% stated in early printings of the manual on page 78 is an error.*	2
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	9

Comments

Wetland name or number WET B

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
H 2.1 Buffers ***(see p. 80)*** *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."* ☐ 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer**.** (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** ☐ 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** ☐ 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** ☐ 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** ☐ 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** ☐ No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** ☐ No paved areas or buildings within 50m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** ☐ Heavy grazing in buffer. **Points = 1** ☐ Vegetated buffers are <2m wide (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0**. ☑ Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	**Figure ___** 1
H 2.2 Corridors and Connections ***(see p. 81)*** H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft wide, has at least 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? (*dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor*). ☐ YES = **4 points** (*go to H 2.3*) ☐ NO = go to H 2.2.2 H 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? ☐ YES = **2 points** (*go to H 2.3*) ☐ NO = H 2.2.3 H 2.2.3 Is the wetland: ☐ within 5 mi (8km) of a brackish or salt water estuary OR ☐ within 3 mi of a large field or pasture (>40 acres) OR ☐ within 1 mi of a lake greater than 20 acres? ☐ YES = **1 point** ☑ NO = **0 points**	0

Total for page 1

Wetland name or number WET B

H 2.3 Near or adjacent to other priority habitats listed by WDFW ***(see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report http://wdfw.wa.gov/hab/phslist.htm)*** Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* ☐ **Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre). ☐ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report p. 152*). ☐ **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock. ✔ **Old-growth/Mature forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age. **(**Mature forests) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest. ☐ **Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158*). ✔ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other. ☐ **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161*). ✔ **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources. ☐ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report: pp. 167-169 and glossary in Appendix A).* ☐ **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human. ☐ **Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft. ☐ **Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ✔ **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long. ✔ If wetland has **3 or more** priority habitats **= 4 points** ☐ If wetland has **2** priority habitats = **3 points** ☐ If wetland has **1** priority habitat **= 1 point** ☐ No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	4

Wetland name or number WET B

H 2.4 Wetland Landscape *(choose the **one** description of the landscape around the wetland that best fits)* ***(see p. 84)*** ☐ There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 ☐ The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 ☑ There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 ☐ The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 ☐ There is at least 1 wetland within ½ mile. points = 2 ☐ There are no wetlands within ½ mile. points = 0	3
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	8
TOTAL for H 1 from page 14	9
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	17

Wetland name or number WET B

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate answers and Category.

Wetland Type *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	**Category**
SC 1.0 Estuarine wetlands ***(see p. 86)*** Does the wetland unit meet the following criteria for Estuarine wetlands? ☐ The dominant water regime is tidal, ☐ Vegetated, and ☐ With a salinity greater than 0.5 ppt. ☐ YES = Go to SC 1.1 NO ☑ =Go to SC 2.0	
SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? ☐ YES = Category I ☐ NO go to SC 1.2	**Cat. I** ☐
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three conditions? ☐ YES = Category I ☐ NO = Category II ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native *Spartina* spp. are the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. ☐ The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	☐ **Cat. I** ☐ **Cat. II** ☐ **Dual rating I/II**

Wetland name or number WET B

SC 2.0 Natural Heritage Wetlands ***(see p. 87)*** Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? *(this question is used to screen out most sites before you need to contact WNHP/DNR)* S/T/R information from Appendix D [✔] or accessed from WNHP/DNR web site [ ] YES [ ] – contact WNHP/DNR (see p. 79) and go to SC 2.2 NO [✔] SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? [ ] YES = Category I NO [✔] not a Heritage Wetland	[ ] **Cat. I**
SC 3.0 Bogs ***(see p. 87)*** Does the wetland unit (**or any part of the unit**) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 [ ] [✔] No - go to Q. 2 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? [ ] Yes - go to Q. 3 [✔] No - Is not a bog for purpose of rating 3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)? [ ] Yes – Is a bog for purpose of rating [ ] No - go to Q. 4 NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. [ ] YES = Category I No [✔] Is not a bog for purpose of rating	[ ] **Cat. I**

Wetland name or number WET B

SC 4.0 Forested Wetlands *(see p. 90)* Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *If you answer yes you will still need to rate the wetland based on its functions.* ☐ **Old-growth forests**: (west of Cascade crest) Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm) or more. NOTE: The criterion for dbh is based on measurements for upland forests. Two-hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The DFW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter. ☐ **Mature forests**: (west of the Cascade Crest) Stands where the largest trees are 80 – 200 years old OR have average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth. ☐ YES = Category I NO ☑ not a forested wetland with special characteristics	**Cat. I** ☐
SC 5.0 Wetlands in Coastal Lagoons *(see p. 91)* Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? ☐ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks ☐ The lagoon in which the wetland is located contains surface water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* ☐ YES = Go to SC 5.1 NO ☑ not a wetland in a coastal lagoon SC 5.1 Does the wetland meets all of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of invasive plant species (see list of invasive species on p. 74). ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. ☐ The wetland is larger than 1/10 acre (4350 square feet) ☐ YES = Category I ☐ NO = Category II	☐ **Cat. I** ☐ **Cat. II**

Wetland name or number WET B

SC 6.0 Interdunal Wetlands ***(see p. 93)*** Is the wetland unit west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ☐ YES - go to SC 6.1 NO ☑ not an interdunal wetland for rating ***If you answer yes you will still need to rate the wetland based on its functions.*** In practical terms that means the following geographic areas: ☐ Long Beach Peninsula- lands west of SR 103 ☐ Grayland-Westport- lands west of SR 105 ☐ Ocean Shores-Copalis- lands west of SR 115 and SR 109 SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is once acre or larger? ☐ YES = Category II ☐ NO – go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? ☐ YES = Category III	**Cat. II** ☐ **Cat. III** ☐
Category of wetland based on Special Characteristics *Choose the "highest" rating if wetland falls into several categories, and record on p. 1.* If you answered NO for all types enter "Not Applicable" on p.1	☐ Cat. I ☐ Cat. II ☐ Cat. III ☑ N/A

Wetland name or number WET C

WETLAND RATING FORM – WESTERN WASHINGTON
Version 2 - Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): Silverado - Wetland C Date of site visit: 11/19/14

Rated by MK Trained by Ecology? Yes ☑ No ☐ Date of training 04/13

SEC: 29 TWNSHP: 24 RNGE: 06E Is S/T/R in Appendix D? Yes ☐ No ☑

Map of wetland unit: Figure ____ Estimated size ~3,200 square feet

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I ___ **II** ___ **III** ✔ **IV** ___

Category I = Score >=70
Category II = Score 51-69
Category III = Score 30-50
Category IV = Score < 30

Score for Water Quality Functions	10
Score for Hydrologic Functions	10
Score for Habitat Functions	18
TOTAL score for Functions	38

Category based on SPECIAL CHARACTERISTICS of wetland

I ___ **II** ___ **Does not Apply** ___

Final Category (choose the "highest" category from above) III

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	✔
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	✔	Check if unit has multiple HGM classes present	✔

Wetland name or number WET C

Does the wetland unit being rated meet any of the criteria below?

If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered* ***animal or plant*** *species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.		✔
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered* ***animal*** *species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category I Natural Heritage Wetlands (see p. 19 of data form).		✔
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*		✔
SP4. *Does the wetland unit have a local significance in addition to its functions*? For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.		✔

To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Wetland name or number WET C

Classification of Wetland Units in Western Washington

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
☑ NO – go to 2 ☐ **YES** – the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe** ☐ **NO – Saltwater Tidal Fringe (Estuarine)** ☐

*If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is rated as an **Estuarine** wetland.* Wetlands that were called estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p.).

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
☑ NO – go to 3 ☐ **YES** – The wetland class is **Flats**

If your wetland can be classified as a "Flats" wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet both** of the following criteria?
___The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) at least 20 acres (8 ha) in size;
___At least 30% of the open water area is deeper than 6.6 ft (2 m)?
☑ NO – go to 4 ☐ **YES –** The wetland class is **Lake-fringe (Lacustrine Fringe)**

4. Does the entire wetland unit **meet all** of the following criteria?
____The wetland is on a slope (*slope can be very gradual*),
____The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
____The water leaves the wetland **without being impounded**?
NOTE: *Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than 1 foot deep).*
☑ NO - go to 5 ☐ **YES –** The wetland class is **Slope**

Wetland name or number WET C

5. Does the entire wetland unit **meet all** of the following criteria?

____ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river

____ The overbank flooding occurs at least once every two years.

NOTE: The riverine unit can contain depressions that are filled with water when the river is not flooding.

☑ NO - go to 6 ☐ **YES** – The wetland class is **Riverine**

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

☐ NO – go to 7 ☑ **YES –** The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding. The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

☐ NO – go to 8 ☐ **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within your wetland. NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM Classes within the wetland unit being rated		*HGM Class to Use in Rating*	
Slope + Riverine	☐	Riverine	☐
Slope + Depressional	☐	Depressional	☐
Slope + Lake-fringe	☐	Lake-fringe	☐
Depressional + Riverine along stream within boundary	☑	Depressional	☑
Depressional + Lake-fringe	☐	Depressional	☐
Salt Water Tidal Fringe and any other class of freshwater wetland	☐	Treat as ESTUARINE under wetlands with special characteristics	☐

If you are unable still to determine which of the above criteria apply to your wetland, or if you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

Wetland name or number WET C

D	**Depressional and Flats Wetlands** **WATER QUALITY FUNCTIONS** - Indicators that the wetland unit functions to improve water quality	**Points** (only 1 score per box)
D	**D 1. Does the wetland unit have the <u>potential</u> to improve water quality?**	***(see p.38)***
D	D 1.1 Characteristics of surface water flows out of the wetland: ☐ Unit is a depression with no surface water leaving it (no outlet) points = 3 ☑ Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2 ☐ Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) points = 1 ☐ Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch points = 1 (*If ditch is not permanently flowing treat unit as "intermittently flowing"*) Provide photo or drawing	**Figure** ___ 2
D	S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic *(use NRCS definitions)* ☐ YES points = 4 ☑ NO points = 0	0
D	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class) ☐ Wetland has persistent, ungrazed, vegetation > = 95% of area points = 5 ☑ Wetland has persistent, ungrazed, vegetation > = 1/2 of area points = 3 ☐ Wetland has persistent, ungrazed vegetation > = 1/10 of area points = 1 ☐ Wetland has persistent, ungrazed vegetation <1/10 of area points = 0 Map of Cowardin vegetation classes	**Figure** ___ 3
D	D1.4 Characteristics of seasonal ponding or inundation. *This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.* ☐ Area seasonally ponded is > ½ total area of wetland points = 4 ☐ Area seasonally ponded is > ¼ total area of wetland points = 2 ☑ Area seasonally ponded is < ¼ total area of wetland points = 0 Map of Hydroperiods	**Figure** ___ 0
D	**Total for D 1** *Add the points in the boxes above*	5
D	**D 2. Does the wetland unit have the <u>opportunity</u> to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ☐ Grazing in the wetland or within 150 ft ☐ Untreated stormwater discharges to wetland ☐ Tilled fields or orchards within 150 ft of wetland ☐ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging ☑ Residential, urban areas, golf courses are within 150 ft of wetland ☐ Wetland is fed by groundwater high in phosphorus or nitrogen ☐ Other_____ ☑ **YES** multiplier is **2** ☐ **NO** multiplier is **1**	***(see p. 44)*** multiplier 2
D	**<u>TOTAL</u> - Water Quality Functions** Multiply the score from D1 by D2 ***Add score to table on p. 1***	10

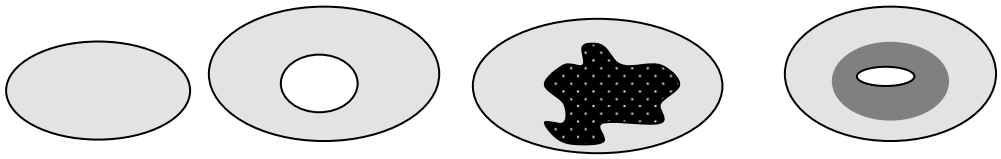
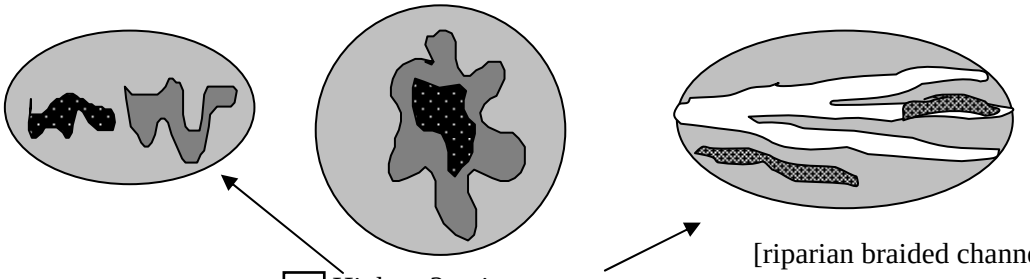
Wetland name or number WET C

D	**Depressional and Flats Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation	**Points** (only 1 score per box)
	D 3. Does the wetland unit have the <u>potential</u> to reduce flooding and erosion?	***(see p.46)***
D	D 3.1 Characteristics of surface water flows out of the wetland unit ☐ Unit is a depression with no surface water leaving it (no outlet) points = 4 ☑ Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2 ☐ Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch points = 1 (*If ditch is not permanently flowing treat unit as "intermittently flowing"*) ☐ Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) points = 0	2
D	D 3.2 Depth of storage during wet periods *Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).* ☐ Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7 ☐ The wetland is a "headwater" wetland" points = 5 ☐ Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5 ☐ Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3 ☐ Unit is flat (yes to Q. 2 or Q. 7 on key) but has small depressions on the surface that trap water points = 1 ☑ Marks of ponding less than 0.5 ft points = 0	0
D	D 3.3 Contribution of wetland unit to storage in the watershed *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* ☐ The area of the basin is less than 10 times the area of unit points = 5 ☑ The area of the basin is 10 to 100 times the area of the unit points = 3 ☐ The area of the basin is more than 100 times the area of the unit points = 0 ☐ Entire unit is in the FLATS class points = 5	3
D	**Total for D 3** *Add the points in the boxes above*	5
D	**D 4. Does the wetland unit have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* ☐ Wetland is in a headwater of a river or stream that has flooding problems ☑ Wetland drains to a river or stream that has flooding problems ☐ Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems ☐ Other_____ ☑ **YES** multiplier is **2** ☐ **NO** multiplier is **1**	***(see p. 49)*** multiplier 2
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 ***Add score to table on p. 1***	10

Wetland name or number WET C

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit have the <u>potential</u> to provide habitat for many species?	
H 1.1 <u>Vegetation structure</u> ***(see p. 72)*** *Check the types of vegetation classes present (as defined by Cowardin)- Size threshold for each class is ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.* ☐ Aquatic bed ☐ Emergent plants ☐ Scrub/shrub (areas where shrubs have >30% cover) ☑ Forested (areas where trees have >30% cover) *If the unit has a forested class check if:* ☑ The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation structures that qualify. If you have:* ☐ 4 structures or more points = 4 ☐ 3 structures points = 2 ☑ 2 structures points = 1 ☐ 1 structure points = 0 Map of Cowardin vegetation classes	**Figure ___** 1
H 1.2. <u>Hydroperiods</u> ***(see p. 73)*** *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ☐ Permanently flooded or inundated ☐ Seasonally flooded or inundated ☑ Occasionally flooded or inundated ☑ Saturated only ☐ 4 or more types present points = 3 ☑ 3 types present points = 2 ☐ 2 types present point = 1 ☐ 1 type present points = 0 ☑ Permanently flowing stream or river in, or adjacent to, the wetland ☐ Seasonally flowing stream in, or adjacent to, the wetland ☐ ***Lake-fringe wetland* = 2 points** ☐ ***Freshwater tidal wetland* = 2 points** Map of hydroperiods	**Figure ___** 3
H 1.3. <u>Richness of Plant Species</u> ***(see p. 75)*** Count the number of plant species in the wetland that cover at least 10 ft^2. (*different patches of the same species can be combined to meet the size threshold)* *You do not have to name the species.* *Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle* If you counted: ☐ > 19 species points = 2 ☑ 5 - 19 species points = 1 ☐ < 5 species points = 0 *List species below if you want to:*	1

Total for page 5

H 1.4. Interspersion of habitats ***(see p. 76)*** Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  ☐ None = 0 points ☑ Low = 1 point ☐ Moderate = 2 points  [riparian braided channels] ☐ High = 3 points NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes	**Figure ___** 1
H 1.5. Special Habitat Features: ***(see p. 77)*** *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ☑ Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). ☑ Standing snags (diameter at the bottom > 4 inches) in the wetland ☐ Undercut banks are present for at least 6.6 ft (2m) and/or overhanging vegetation extends at least 3.3 ft (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft (10m) ☐ Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* ☐ At least ¼ acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated.*(structures for egg-laying by amphibians)* ☐ Invasive plants cover less than 25% of the wetland area in each stratum of plants *NOTE: The 20% stated in early printings of the manual on page 78 is an error.*	2
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	8

Comments

Wetland name or number WET C

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
H 2.1 Buffers ***(see p. 80)*** *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."* ☐ 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer**.** (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** ☐ 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** ☐ 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** ☐ 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** ☑ 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** ☐ No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** ☐ No paved areas or buildings within 50m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** ☐ Heavy grazing in buffer. **Points = 1** ☐ Vegetated buffers are <2m wide (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0**. ☐ Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	**Figure ___** 3
H 2.2 Corridors and Connections ***(see p. 81)*** H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft wide, has at least 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? (*dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor*). ☐ YES = **4 points** (*go to H 2.3*) ☐ NO = go to H 2.2.2 H 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? ☐ YES = **2 points** (*go to H 2.3*) ☐ NO = H 2.2.3 H 2.2.3 Is the wetland: ☐ within 5 mi (8km) of a brackish or salt water estuary OR ☐ within 3 mi of a large field or pasture (>40 acres) OR ☐ within 1 mi of a lake greater than 20 acres? ☐ YES = **1 point** ☑ NO = **0 points**	0

Total for page 3

Wetland name or number WET C

H 2.3 Near or adjacent to other priority habitats listed by WDFW ***(see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report http://wdfw.wa.gov/hab/phslist.htm)*** Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* ☐ **Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre). ☐ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report p. 152*). ☐ **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock. ✔ **Old-growth/Mature forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age. **(**Mature forests) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest. ☐ **Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158*). ✔ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other. ☐ **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161*). ✔ **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources. ☐ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report: pp. 167-169 and glossary in Appendix A).* ☐ **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human. ☐ **Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft. ☐ **Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ✔ **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long. ✔ If wetland has **3 or more** priority habitats **= 4 points** ☐ If wetland has **2** priority habitats = **3 points** ☐ If wetland has **1** priority habitat **= 1 point** ☐ No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	4

Wetland name or number WET C

H 2.4 Wetland Landscape *(choose the **one** description of the landscape around the wetland that best fits)* ***(see p. 84)*** ☐ There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 ☐ The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 ☑ There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 ☐ The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 ☐ There is at least 1 wetland within ½ mile. points = 2 ☐ There are no wetlands within ½ mile. points = 0	3
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	10
TOTAL for H 1 from page 14	8
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	18

Wetland name or number WET C

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate answers and Category.

Wetland Type *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	**Category**
SC 1.0 Estuarine wetlands ***(see p. 86)*** Does the wetland unit meet the following criteria for Estuarine wetlands? ☐ The dominant water regime is tidal, ☐ Vegetated, and ☐ With a salinity greater than 0.5 ppt. ☐ YES = Go to SC 1.1 NO ☑ =Go to SC 2.0	
SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? ☐ YES = Category I ☐ NO go to SC 1.2	**Cat. I** ☐
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three conditions? ☐ YES = Category I ☐ NO = Category II ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native *Spartina* spp. are the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. ☐ The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	☐ **Cat. I** ☐ **Cat. II** ☐ **Dual rating I/II**

Wetland name or number WET C

SC 2.0 Natural Heritage Wetlands ***(see p. 87)*** Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? *(this question is used to screen out most sites before you need to contact WNHP/DNR)* S/T/R information from Appendix D [✔] or accessed from WNHP/DNR web site [ ] YES [ ] – contact WNHP/DNR (see p. 79) and go to SC 2.2 NO [✔] SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? [ ] YES = Category I NO [✔] not a Heritage Wetland	[ ] **Cat. I**
SC 3.0 Bogs ***(see p. 87)*** Does the wetland unit (**or any part of the unit**) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 [ ] [✔] No - go to Q. 2 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? [ ] Yes - go to Q. 3 [✔] No - Is not a bog for purpose of rating 3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)? [ ] Yes – Is a bog for purpose of rating [ ] No - go to Q. 4 NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. [ ] YES = Category I No [✔] Is not a bog for purpose of rating	[ ] **Cat. I**

Wetland name or number WET C

SC 4.0 Forested Wetlands *(see p. 90)* Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *If you answer yes you will still need to rate the wetland based on its functions.* ☐ **Old-growth forests**: (west of Cascade crest) Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm) or more. NOTE: The criterion for dbh is based on measurements for upland forests. Two-hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The DFW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter. ☐ **Mature forests**: (west of the Cascade Crest) Stands where the largest trees are 80 – 200 years old OR have average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth. ☐ YES = Category I NO ☑ not a forested wetland with special characteristics	**Cat. I** ☐
SC 5.0 Wetlands in Coastal Lagoons *(see p. 91)* Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? ☐ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks ☐ The lagoon in which the wetland is located contains surface water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* ☐ YES = Go to SC 5.1 NO ☑ not a wetland in a coastal lagoon SC 5.1 Does the wetland meets all of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of invasive plant species (see list of invasive species on p. 74). ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. ☐ The wetland is larger than 1/10 acre (4350 square feet) ☐ YES = Category I ☐ NO = Category II	☐ **Cat. I** ☐ **Cat. II**

Wetland name or number WET C

SC 6.0 Interdunal Wetlands ***(see p. 93)*** Is the wetland unit west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ☐ YES - go to SC 6.1 NO ☑ not an interdunal wetland for rating ***If you answer yes you will still need to rate the wetland based on its functions.*** In practical terms that means the following geographic areas: ☐ Long Beach Peninsula- lands west of SR 103 ☐ Grayland-Westport- lands west of SR 105 ☐ Ocean Shores-Copalis- lands west of SR 115 and SR 109 SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is once acre or larger? ☐ YES = Category II ☐ NO – go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? ☐ YES = Category III	**Cat. II** ☐ **Cat. III** ☐
Category of wetland based on Special Characteristics *Choose the "highest" rating if wetland falls into several categories, and record on p. 1.* If you answered NO for all types enter "Not Applicable" on p.1	☐ Cat. I ☐ Cat. II ☐ Cat. III ☑ N/A

Wetland name or number WET D

WETLAND RATING FORM – WESTERN WASHINGTON
Version 2 - Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): Silverado - Wetland D Date of site visit: 06/21/17

Rated by MK Trained by Ecology? Yes ☑ No ☐ Date of training 04/13

SEC: 29 TWNSHP: 24 RNGE: 06E Is S/T/R in Appendix D? Yes ☐ No ☑

Map of wetland unit: Figure ____ Estimated size 0.007 AC

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I ___ **II** ___ **III** ✔ **IV** ___

Category I = Score >=70
Category II = Score 51-69
Category III = Score 30-50
Category IV = Score < 30

Score for Water Quality Functions	10
Score for Hydrologic Functions	10
Score for Habitat Functions	16
TOTAL score for Functions	36

Category based on SPECIAL CHARACTERISTICS of wetland

I ___ **II** ___ **Does not Apply** ___

Final Category (choose the "highest" category from above) **III**

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	✔
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	✔	Check if unit has multiple HGM classes present	✔

Wetland name or number WET D

Does the wetland unit being rated meet any of the criteria below?

If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered* ***animal or plant*** *species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.		✔
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered* ***animal*** *species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category I Natural Heritage Wetlands (see p. 19 of data form).		✔
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*		✔
SP4. *Does the wetland unit have a local significance in addition to its functions*? For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.		✔

To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Wetland name or number WET D

Classification of Wetland Units in Western Washington

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
☑ NO – go to 2 ☐ **YES** – the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe** ☐ **NO – Saltwater Tidal Fringe (Estuarine)** ☐

*If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is rated as an **Estuarine** wetland.* Wetlands that were called estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p.).

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
☑ NO – go to 3 ☐ **YES** – The wetland class is **Flats**

If your wetland can be classified as a "Flats" wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet both** of the following criteria?
___The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) at least 20 acres (8 ha) in size;
___At least 30% of the open water area is deeper than 6.6 ft (2 m)?
☑ NO – go to 4 ☐ **YES –** The wetland class is **Lake-fringe (Lacustrine Fringe)**

4. Does the entire wetland unit **meet all** of the following criteria?
____The wetland is on a slope (*slope can be very gradual*),
____The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
____The water leaves the wetland **without being impounded**?
NOTE: *Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than 1 foot deep).*
☑ NO - go to 5 ☐ **YES –** The wetland class is **Slope**

Wetland name or number WET D

5. Does the entire wetland unit **meet all** of the following criteria?

____ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river

____ The overbank flooding occurs at least once every two years.

NOTE: The riverine unit can contain depressions that are filled with water when the river is not flooding.

☑ NO - go to 6 ☐ **YES** – The wetland class is **Riverine**

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

☐ NO – go to 7 ☑ **YES –** The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding. The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

☐ NO – go to 8 ☐ **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within your wetland. NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM Classes within the wetland unit being rated		*HGM Class to Use in Rating*	
Slope + Riverine	☐	Riverine	☐
Slope + Depressional	☐	Depressional	☐
Slope + Lake-fringe	☐	Lake-fringe	☐
Depressional + Riverine along stream within boundary	☑	Depressional	☑
Depressional + Lake-fringe	☐	Depressional	☐
Salt Water Tidal Fringe and any other class of freshwater wetland	☐	Treat as ESTUARINE under wetlands with special characteristics	☐

If you are unable still to determine which of the above criteria apply to your wetland, or if you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

Wetland name or number WET D

D	**Depressional and Flats Wetlands** **WATER QUALITY FUNCTIONS** - Indicators that the wetland unit functions to improve water quality	**Points** (only 1 score per box)
D	**D 1. Does the wetland unit have the <u>potential</u> to improve water quality?**	***(see p.38)***
D	D 1.1 Characteristics of surface water flows out of the wetland: ☐ Unit is a depression with no surface water leaving it (no outlet) points = 3 ☑ Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2 ☐ Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) points = 1 ☐ Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch points = 1 (*If ditch is not permanently flowing treat unit as "intermittently flowing"*) Provide photo or drawing	**Figure** ___ 2
D	S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic *(use NRCS definitions)* ☐ YES points = 4 ☑ NO points = 0	0
D	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class) ☐ Wetland has persistent, ungrazed, vegetation > = 95% of area points = 5 ☑ Wetland has persistent, ungrazed, vegetation > = 1/2 of area points = 3 ☐ Wetland has persistent, ungrazed vegetation > = 1/10 of area points = 1 ☐ Wetland has persistent, ungrazed vegetation <1/10 of area points = 0 Map of Cowardin vegetation classes	**Figure** ___ 3
D	D1.4 Characteristics of seasonal ponding or inundation. *This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.* ☐ Area seasonally ponded is > ½ total area of wetland points = 4 ☐ Area seasonally ponded is > ¼ total area of wetland points = 2 ☑ Area seasonally ponded is < ¼ total area of wetland points = 0 Map of Hydroperiods	**Figure** ___ 0
D	**Total for D 1** *Add the points in the boxes above*	5
D	**D 2. Does the wetland unit have the <u>opportunity</u> to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ☐ Grazing in the wetland or within 150 ft ☐ Untreated stormwater discharges to wetland ☐ Tilled fields or orchards within 150 ft of wetland ☐ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging ☑ Residential, urban areas, golf courses are within 150 ft of wetland ☐ Wetland is fed by groundwater high in phosphorus or nitrogen ☐ Other_____ ☑ **YES** multiplier is **2** ☐ **NO** multiplier is **1**	***(see p. 44)*** multiplier 2
D	**<u>TOTAL</u> - Water Quality Functions** Multiply the score from D1 by D2 ***Add score to table on p. 1***	10

Wetland name or number WET D

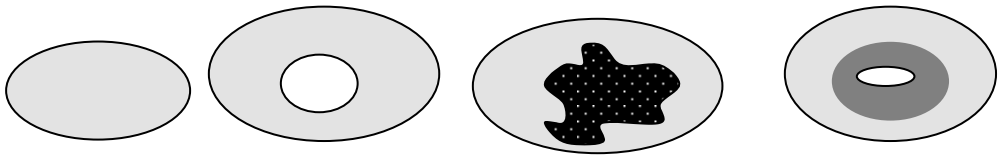
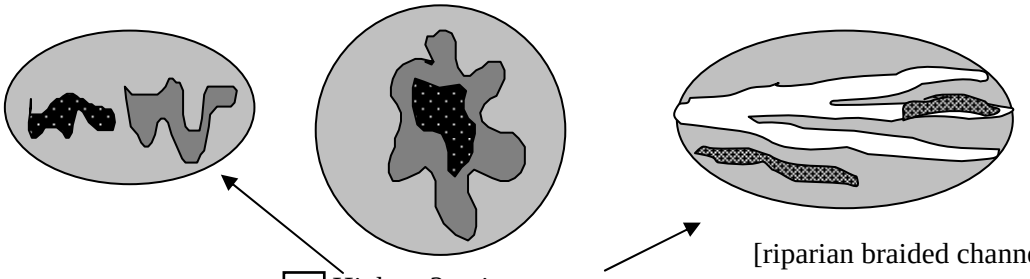
D	**Depressional and Flats Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation	**Points** (only 1 score per box)
	D 3. Does the wetland unit have the <u>potential</u> to reduce flooding and erosion?	***(see p.46)***
D	D 3.1 Characteristics of surface water flows out of the wetland unit ☐ Unit is a depression with no surface water leaving it (no outlet) points = 4 ☑ Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2 ☐ Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch points = 1 (*If ditch is not permanently flowing treat unit as "intermittently flowing"*) ☐ Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) points = 0	2
D	D 3.2 Depth of storage during wet periods *Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).* ☐ Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7 ☐ The wetland is a "headwater" wetland" points = 5 ☐ Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5 ☐ Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3 ☐ Unit is flat (yes to Q. 2 or Q. 7 on key) but has small depressions on the surface that trap water points = 1 ☑ Marks of ponding less than 0.5 ft points = 0	0
D	D 3.3 Contribution of wetland unit to storage in the watershed *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* ☐ The area of the basin is less than 10 times the area of unit points = 5 ☑ The area of the basin is 10 to 100 times the area of the unit points = 3 ☐ The area of the basin is more than 100 times the area of the unit points = 0 ☐ Entire unit is in the FLATS class points = 5	3
D	**Total for D 3** *Add the points in the boxes above*	5
D	**D 4. Does the wetland unit have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* ☐ Wetland is in a headwater of a river or stream that has flooding problems ☑ Wetland drains to a river or stream that has flooding problems ☐ Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems ☐ Other_____ ☑ **YES** multiplier is **2** ☐ **NO** multiplier is **1**	***(see p. 49)*** multiplier 2
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 ***Add score to table on p. 1***	10

Wetland name or number WET D

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit have the <u>potential</u> to provide habitat for many species?	
H 1.1 <u>Vegetation structure</u> ***(see p. 72)*** *Check the types of vegetation classes present (as defined by Cowardin)- Size threshold for each class is ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.* ☐ Aquatic bed ☐ Emergent plants ☐ Scrub/shrub (areas where shrubs have >30% cover) ☑ Forested (areas where trees have >30% cover) *If the unit has a forested class check if:* ☑ The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation structures that qualify. If you have:* ☐ 4 structures or more points = 4 ☐ 3 structures points = 2 ☑ 2 structures points = 1 ☐ 1 structure points = 0 Map of Cowardin vegetation classes	**Figure ___** 1
H 1.2. <u>Hydroperiods</u> ***(see p. 73)*** *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ☐ Permanently flooded or inundated ☐ Seasonally flooded or inundated ☑ Occasionally flooded or inundated ☑ Saturated only ☐ 4 or more types present points = 3 ☑ 3 types present points = 2 ☐ 2 types present point = 1 ☐ 1 type present points = 0 ☑ Permanently flowing stream or river in, or adjacent to, the wetland ☐ Seasonally flowing stream in, or adjacent to, the wetland ☐ ***Lake-fringe wetland* = 2 points** ☐ ***Freshwater tidal wetland* = 2 points** Map of hydroperiods	**Figure ___** 3
H 1.3. <u>Richness of Plant Species</u> ***(see p. 75)*** Count the number of plant species in the wetland that cover at least 10 ft^2. (*different patches of the same species can be combined to meet the size threshold)* *You do not have to name the species.* *Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle* If you counted: ☐ > 19 species points = 2 ☑ 5 - 19 species points = 1 ☐ < 5 species points = 0 *List species below if you want to:*	1

Total for page 5

Wetland name or number WET D

H 1.4. Interspersion of habitats ***(see p. 76)*** Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  ☐ None = 0 points ☑ Low = 1 point ☐ Moderate = 2 points  [riparian braided channels] ☐ High = 3 points NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes	**Figure ___** 1
H 1.5. Special Habitat Features: ***(see p. 77)*** *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ☑ Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). ☑ Standing snags (diameter at the bottom > 4 inches) in the wetland ☐ Undercut banks are present for at least 6.6 ft (2m) and/or overhanging vegetation extends at least 3.3 ft (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft (10m) ☐ Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* ☐ At least ¼ acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated.*(structures for egg-laying by amphibians)* ☐ Invasive plants cover less than 25% of the wetland area in each stratum of plants *NOTE: The 20% stated in early printings of the manual on page 78 is an error.*	2
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	8

Comments

Wetland name or number WET D

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
H 2.1 Buffers ***(see p. 80)*** *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."* ☐ 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer**.** (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** ☐ 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** ☐ 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** ☐ 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** ☐ 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** ☐ No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** ☐ No paved areas or buildings within 50m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** ☐ Heavy grazing in buffer. **Points = 1** ☐ Vegetated buffers are <2m wide (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0**. ☑ Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	**Figure ___** 1
H 2.2 Corridors and Connections ***(see p. 81)*** H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft wide, has at least 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? (*dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor*). ☐ YES = **4 points** (*go to H 2.3*) ☐ NO = go to H 2.2.2 H 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? ☐ YES = **2 points** (*go to H 2.3*) ☐ NO = H 2.2.3 H 2.2.3 Is the wetland: ☐ within 5 mi (8km) of a brackish or salt water estuary OR ☐ within 3 mi of a large field or pasture (>40 acres) OR ☐ within 1 mi of a lake greater than 20 acres? ☐ YES = **1 point** ☑ NO = **0 points**	0

Total for page 1

Wetland name or number WET D

H 2.3 Near or adjacent to other priority habitats listed by WDFW ***(see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report http://wdfw.wa.gov/hab/phslist.htm)*** Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* ☐ **Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre). ☐ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report p. 152*). ☐ **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock. ✔ **Old-growth/Mature forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age. **(**Mature forests) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest. ☐ **Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158*). ✔ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other. ☐ **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161*). ✔ **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources. ☐ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report: pp. 167-169 and glossary in Appendix A).* ☐ **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human. ☐ **Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft. ☐ **Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ✔ **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long. ✔ If wetland has **3 or more** priority habitats **= 4 points** ☐ If wetland has **2** priority habitats = **3 points** ☐ If wetland has **1** priority habitat **= 1 point** ☐ No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	4

Wetland name or number WET D

H 2.4 Wetland Landscape *(choose the **one** description of the landscape around the wetland that best fits)* ***(see p. 84)*** ☐ There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 ☐ The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 ☑ There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 ☐ The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 ☐ There is at least 1 wetland within ½ mile. points = 2 ☐ There are no wetlands within ½ mile. points = 0	3
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	8
TOTAL for H 1 from page 14	8
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	16

Wetland name or number WET D

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate answers and Category.

Wetland Type *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	**Category**
SC 1.0 Estuarine wetlands ***(see p. 86)*** Does the wetland unit meet the following criteria for Estuarine wetlands? ☐ The dominant water regime is tidal, ☐ Vegetated, and ☐ With a salinity greater than 0.5 ppt. ☐ YES = Go to SC 1.1 NO ☑ =Go to SC 2.0	
SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? ☐ YES = Category I ☐ NO go to SC 1.2	**Cat. I** ☐
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three conditions? ☐ YES = Category I ☐ NO = Category II ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native *Spartina* spp. are the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. ☐ The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	☐ **Cat. I** ☐ **Cat. II** ☐ **Dual rating I/II**

Wetland name or number WET D

SC 2.0 Natural Heritage Wetlands ***(see p. 87)*** Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? *(this question is used to screen out most sites before you need to contact WNHP/DNR)* S/T/R information from Appendix D [✔] or accessed from WNHP/DNR web site [ ] YES [ ] – contact WNHP/DNR (see p. 79) and go to SC 2.2 NO [✔] SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? [ ] YES = Category I NO [✔] not a Heritage Wetland	[ ] **Cat. I**
SC 3.0 Bogs ***(see p. 87)*** Does the wetland unit (**or any part of the unit**) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 [ ] [✔] No - go to Q. 2 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? [ ] Yes - go to Q. 3 [✔] No - Is not a bog for purpose of rating 3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)? [ ] Yes – Is a bog for purpose of rating [ ] No - go to Q. 4 NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. [ ] YES = Category I No [✔] Is not a bog for purpose of rating	[ ] **Cat. I**

Wetland name or number WET D

SC 4.0 Forested Wetlands *(see p. 90)* Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *If you answer yes you will still need to rate the wetland based on its functions.* ☐ **Old-growth forests**: (west of Cascade crest) Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm) or more. NOTE: The criterion for dbh is based on measurements for upland forests. Two-hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The DFW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter. ☐ **Mature forests**: (west of the Cascade Crest) Stands where the largest trees are 80 – 200 years old OR have average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth. ☐ YES = Category I NO ☑ not a forested wetland with special characteristics	**Cat. I** ☐
SC 5.0 Wetlands in Coastal Lagoons *(see p. 91)* Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? ☐ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks ☐ The lagoon in which the wetland is located contains surface water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* ☐ YES = Go to SC 5.1 NO ☑ not a wetland in a coastal lagoon SC 5.1 Does the wetland meets all of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of invasive plant species (see list of invasive species on p. 74). ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. ☐ The wetland is larger than 1/10 acre (4350 square feet) ☐ YES = Category I ☐ NO = Category II	☐ **Cat. I** ☐ **Cat. II**

Wetland name or number WET D

SC 6.0 Interdunal Wetlands ***(see p. 93)*** Is the wetland unit west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ☐ YES - go to SC 6.1 NO ☑ not an interdunal wetland for rating ***If you answer yes you will still need to rate the wetland based on its functions.*** In practical terms that means the following geographic areas: ☐ Long Beach Peninsula- lands west of SR 103 ☐ Grayland-Westport- lands west of SR 105 ☐ Ocean Shores-Copalis- lands west of SR 115 and SR 109 SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is once acre or larger? ☐ YES = Category II ☐ NO – go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? ☐ YES = Category III	**Cat. II** ☐ **Cat. III** ☐
Category of wetland based on Special Characteristics *Choose the "highest" rating if wetland falls into several categories, and record on p. 1.* If you answered NO for all types enter "Not Applicable" on p.1	☐ Cat. I ☐ Cat. II ☐ Cat. III ☑ N/A

Wetland name or number Wet E

WETLAND RATING FORM – WESTERN WASHINGTON
Version 2 - Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): Silverado - Wetland E Date of site visit: 06/21/17

Rated by MK Trained by Ecology? Yes ☑ No ☐ Date of training 04/13

SEC: 29 TWNSHP: 24 RNGE: 06 Is S/T/R in Appendix D? Yes ☐ No ☑

Map of wetland unit: Figure ____ Estimated size 0.186 AC

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I ___ **II** ___ **III** ✔ **IV** ___

Category I = Score >=70
Category II = Score 51-69
Category III = Score 30-50
Category IV = Score < 30

Score for Water Quality Functions	6
Score for Hydrologic Functions	10
Score for Habitat Functions	16
TOTAL score for Functions	32

Category based on SPECIAL CHARACTERISTICS of wetland

I ___ **II** ___ **Does not Apply** ✔

Final Category (choose the "highest" category from above) III

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	✔
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	✔	Check if unit has multiple HGM classes present	☐

Wetland name or number Wet E

Does the wetland unit being rated meet any of the criteria below?

If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered* ***animal or plant*** *species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.		✔
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered* ***animal*** *species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category I Natural Heritage Wetlands (see p. 19 of data form).		✔
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*		✔
SP4. *Does the wetland unit have a local significance in addition to its functions*? For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.		✔

To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Wetland name or number Wet E

Classification of Wetland Units in Western Washington

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
☑ NO – go to 2 ☐ **YES** – the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe** ☐ **NO – Saltwater Tidal Fringe (Estuarine)** ☐

*If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is rated as an **Estuarine** wetland.* Wetlands that were called estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p.).

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
☑ NO – go to 3 ☐ **YES** – The wetland class is **Flats**

If your wetland can be classified as a "Flats" wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet both** of the following criteria?
___The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) at least 20 acres (8 ha) in size;
___At least 30% of the open water area is deeper than 6.6 ft (2 m)?
☑ NO – go to 4 ☐ **YES –** The wetland class is **Lake-fringe (Lacustrine Fringe)**

4. Does the entire wetland unit **meet all** of the following criteria?
✔ The wetland is on a slope (*slope can be very gradual*),
✔ The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
✔ The water leaves the wetland **without being impounded**?
NOTE: *Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than 1 foot deep).*
☐ NO - go to 5 ☑ **YES –** The wetland class is **Slope**

Wetland name or number Wet E

5. Does the entire wetland unit **meet all** of the following criteria?

____ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river

____ The overbank flooding occurs at least once every two years.

NOTE: The riverine unit can contain depressions that are filled with water when the river is not flooding.

☐ NO - go to 6 ☐ **YES** – The wetland class is **Riverine**

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

☐ NO – go to 7 ☐ **YES –** The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding. The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

☐ NO – go to 8 ☐ **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within your wetland. NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM Classes within the wetland unit being rated	*HGM Class to Use in Rating*
Slope + Riverine ☐	Riverine ☐
Slope + Depressional ☐	Depressional ☐
Slope + Lake-fringe ☐	Lake-fringe ☐
Depressional + Riverine along stream within boundary ☐	Depressional ☐
Depressional + Lake-fringe ☐	Depressional ☐
Salt Water Tidal Fringe and any other class of freshwater wetland ☐	Treat as ESTUARINE under wetlands with special characteristics ☐

If you are unable still to determine which of the above criteria apply to your wetland, or if you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

Wetland name or number Wet E

S	**Slope Wetlands** WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality	**Points** (only 1 score per box)
S	**S 1. Does the wetland unit have the <u>potential</u> to improve water quality?**	***(see p.64)***
S	S 1.1 Characteristics of average slope of unit: ☐ Slope is1% or less *(a 1% slope has a 1 foot vertical drop in elevation for every 100 ft horizontal distance*) points = 3 ☐ Slope is 1% - 2% points = 2 ☐ Slope is 2% - 5% points = 1 ☑ Slope is greater than 5% points = 0	0
S	S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic *(use NRCS definitions)* ☐ YES = 3 points ☑ NO = 0 points	0
S	S 1.3 Characteristics of the vegetation in the wetland that trap sediments and pollutants: *Choose the points appropriate for the description that best fits the vegetation in the wetland. Dense vegetation means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 inches.* ☐ Dense, uncut, herbaceous vegetation > 90% of the wetland area points = 6 ☑ Dense, uncut, herbaceous vegetation > 1/2 of area points = 3 ☐ Dense, woody, vegetation > ½ of area points = 2 ☐ Dense, uncut, herbaceous vegetation > 1/4 of area points = 1 ☐ Does not meet any of the criteria above for vegetation points = 0 Aerial photo or map with vegetation polygons	**Figure** ___ 3
S	**Total for S 1** *Add the points in the boxes above*	3
S	**S 2. Does the wetland unit have the <u>opportunity</u> to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ☐ Grazing in the wetland or within 150ft ☐ Untreated stormwater discharges to wetland ☐ Tilled fields, logging, or orchards within 150 feet of wetland ☑ Residential, urban areas, or golf courses are within 150 ft upslope of wetland ☐ Other_____ ☑ **YES** multiplier is **2** ☐ **NO** multiplier is **1**	***(see p.67)*** multiplier 2
S	**TOTAL - Water Quality Functions** Multiply the score from S1 by S2 ***Add score to table on p. 1***	6

Comments

Wetland name or number Wet E

S	**Slope Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream erosion	**Points** (only 1 score per box)
	S 3. Does the wetland unit have the <u>potential</u> to reduce flooding and stream erosion?	***(see p.68)***
S	S 3.1 Characteristics of vegetation that reduce the velocity of surface flows during storms. *Choose the points appropriate for the description that best fit conditions in the wetland. (stems of plants should be thick enough (usually > 1/8in), or dense enough, to remain erect during surface flows)* ☐ Dense, uncut, **rigid** vegetation covers > 90% of the area of the wetland. points = 6 ☑ Dense, uncut, **rigid** vegetation > 1/2 area of wetland points = 3 ☐ Dense, uncut, **rigid** vegetation > 1/4 area points = 1 ☐ More than 1/4 of area is grazed, mowed, tilled or vegetation is not rigid points = 0	3
S	S 3.2 Characteristics of slope wetland that holds back small amounts of flood flows: The slope wetland has small surface depressions that can retain water over at least 10% of its area. ☑ YES points = 2 ☐ NO points = 0	2
S	*Add the points in the boxes above*	5
S	**S 4. Does the wetland have the <u>opportunity</u> to reduce flooding and erosion?** Is the wetland in a landscape position where the reduction in water velocity it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows? *Note which of the following conditions apply.* ☑ Wetland has surface runoff that drains to a river or stream that has flooding problems ☐ Other_____ *(Answer NO if the major source of water is controlled by a reservoir (e.g. wetland is a seep that is on the downstream side of a dam)* ☑ **YES** multiplier is **2** ☐ **NO** multiplier is **1**	***(see p. 70)*** multiplier 2
S	**TOTAL - Hydrologic Functions** Multiply the score from S 3 by S 4 ***Add score to table on p. 1***	10

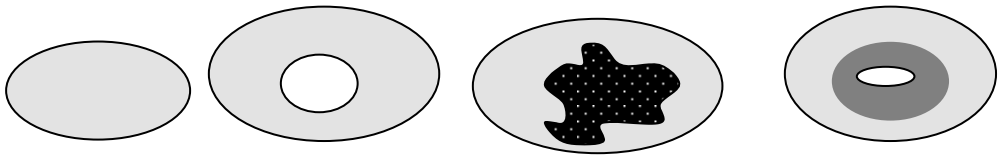
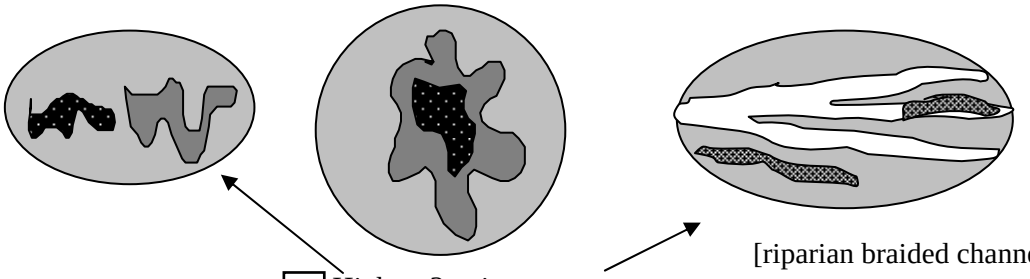
Comments

Wetland name or number Wet E

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit have the <u>potential</u> to provide habitat for many species?	
H 1.1 <u>Vegetation structure</u> ***(see p. 72)*** *Check the types of vegetation classes present (as defined by Cowardin)- Size threshold for each class is ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.* ☐ Aquatic bed ☐ Emergent plants ☐ Scrub/shrub (areas where shrubs have >30% cover) ☑ Forested (areas where trees have >30% cover) *If the unit has a forested class check if:* ☑ The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation structures that qualify. If you have:* ☐ 4 structures or more points = 4 ☐ 3 structures points = 2 ☑ 2 structures points = 1 ☐ 1 structure points = 0 Map of Cowardin vegetation classes	**Figure ___** 1
H 1.2. <u>Hydroperiods</u> ***(see p. 73)*** *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ☐ Permanently flooded or inundated — ☐ 4 or more types present points = 3 ☐ Seasonally flooded or inundated — ☐ 3 types present points = 2 ☐ Occasionally flooded or inundated — ☐ 2 types present point = 1 ☑ Saturated only — ☑ 1 type present points = 0 ☐ Permanently flowing stream or river in, or adjacent to, the wetland ☐ Seasonally flowing stream in, or adjacent to, the wetland ☐ ***Lake-fringe wetland* = 2 points** ☐ ***Freshwater tidal wetland* = 2 points** Map of hydroperiods	**Figure ___** 0
H 1.3. <u>Richness of Plant Species</u> ***(see p. 75)*** Count the number of plant species in the wetland that cover at least 10 ft^2. (*different patches of the same species can be combined to meet the size threshold)* *You do not have to name the species.* *Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle* If you counted: ☐ > 19 species points = 2 *List species below if you want to:* ☑ 5 - 19 species points = 1 ☐ < 5 species points = 0	1

Total for page 2

Wetland name or number Wet E

H 1.4. Interspersion of habitats ***(see p. 76)*** Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  ☑ None = 0 points ☐ Low = 1 point ☐ Moderate = 2 points  [riparian braided channels] ☐ High = 3 points NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes	**Figure ___** 0
H 1.5. Special Habitat Features: ***(see p. 77)*** *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ☑ Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). ☑ Standing snags (diameter at the bottom > 4 inches) in the wetland ☐ Undercut banks are present for at least 6.6 ft (2m) and/or overhanging vegetation extends at least 3.3 ft (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft (10m) ☐ Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* ☐ At least ¼ acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated.*(structures for egg-laying by amphibians)* ☑ Invasive plants cover less than 25% of the wetland area in each stratum of plants *NOTE: The 20% stated in early printings of the manual on page 78 is an error.*	3
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	5

Comments

Wetland name or number Wet E

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
H 2.1 Buffers ***(see p. 80)*** *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."* ☐ 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer**.** (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** ☑ 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** ☐ 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** ☐ 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** ☐ 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** ☐ No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** ☐ No paved areas or buildings within 50m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** ☐ Heavy grazing in buffer. **Points = 1** ☐ Vegetated buffers are <2m wide (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0**. ☐ Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	**Figure ___** 4
H 2.2 Corridors and Connections ***(see p. 81)*** H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft wide, has at least 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? (*dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor*). ☐ YES = **4 points** (*go to H 2.3*) ☑ NO = go to H 2.2.2 H 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? ☐ YES = **2 points** (*go to H 2.3*) ☑ NO = H 2.2.3 H 2.2.3 Is the wetland: ☐ within 5 mi (8km) of a brackish or salt water estuary OR ☐ within 3 mi of a large field or pasture (>40 acres) OR ☐ within 1 mi of a lake greater than 20 acres? ☐ YES = **1 point** ☑ NO = **0 points**	0

Total for page 4

Wetland name or number Wet E

H 2.3 Near or adjacent to other priority habitats listed by WDFW ***(see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report http://wdfw.wa.gov/hab/phslist.htm)*** Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* ☐ **Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre). ☐ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report p. 152*). ☐ **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock. ✔ **Old-growth/Mature forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age. **(**Mature forests) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest. ☐ **Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158*). ✔ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other. ☐ **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161*). ✔ **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources. ☐ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report: pp. 167-169 and glossary in Appendix A).* ☐ **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human. ☐ **Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft. ☐ **Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ✔ **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long. ✔ If wetland has **3 or more** priority habitats **= 4 points** ☐ If wetland has **2** priority habitats = **3 points** ☐ If wetland has **1** priority habitat **= 1 point** ☐ No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	4

Wetland name or number Wet E

H 2.4 Wetland Landscape *(choose the **one** description of the landscape around the wetland that best fits)* ***(see p. 84)*** ☐ There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 ☐ The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 ☑ There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 ☐ The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 ☐ There is at least 1 wetland within ½ mile. points = 2 ☐ There are no wetlands within ½ mile. points = 0	3
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	11
TOTAL for H 1 from page 14	5
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	16

Wetland name or number Wet E

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate answers and Category.

Wetland Type *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	**Category**
SC 1.0 Estuarine wetlands ***(see p. 86)*** Does the wetland unit meet the following criteria for Estuarine wetlands? ☐ The dominant water regime is tidal, ☐ Vegetated, and ☐ With a salinity greater than 0.5 ppt. ☐ YES = Go to SC 1.1 NO ☑ =Go to SC 2.0	
SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? ☐ YES = Category I ☐ NO go to SC 1.2	**Cat. I** ☐
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three conditions? ☐ YES = Category I ☐ NO = Category II ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native *Spartina* spp. are the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. ☐ The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	☐ **Cat. I** ☐ **Cat. II** ☐ **Dual rating I/II**

Wetland name or number Wet E

SC 2.0 Natural Heritage Wetlands ***(see p. 87)*** Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? *(this question is used to screen out most sites before you need to contact WNHP/DNR)* S/T/R information from Appendix D [✔] or accessed from WNHP/DNR web site [ ] YES [ ] – contact WNHP/DNR (see p. 79) and go to SC 2.2 NO [✔] SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? [ ] YES = Category I NO [✔] not a Heritage Wetland	[ ] **Cat. I**
SC 3.0 Bogs ***(see p. 87)*** Does the wetland unit (**or any part of the unit**) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 [ ] [✔] No - go to Q. 2 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? [ ] Yes - go to Q. 3 [✔] No - Is not a bog for purpose of rating 3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)? [ ] Yes – Is a bog for purpose of rating [ ] No - go to Q. 4 NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. [ ] YES = Category I No [ ] Is not a bog for purpose of rating	[ ] **Cat. I**

Wetland name or number Wet E

SC 4.0 Forested Wetlands *(see p. 90)* Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *If you answer yes you will still need to rate the wetland based on its functions.* ☐ **Old-growth forests**: (west of Cascade crest) Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm) or more. NOTE: The criterion for dbh is based on measurements for upland forests. Two-hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The DFW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter. ☐ **Mature forests**: (west of the Cascade Crest) Stands where the largest trees are 80 – 200 years old OR have average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth. ☐ YES = Category I NO ☑ not a forested wetland with special characteristics	**Cat. I** ☐
SC 5.0 Wetlands in Coastal Lagoons *(see p. 91)* Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? ☐ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks ☐ The lagoon in which the wetland is located contains surface water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* ☐ YES = Go to SC 5.1 NO ☑ not a wetland in a coastal lagoon SC 5.1 Does the wetland meets all of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of invasive plant species (see list of invasive species on p. 74). ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. ☐ The wetland is larger than 1/10 acre (4350 square feet) ☐ YES = Category I ☐ NO = Category II	☐ **Cat. I** ☐ **Cat. II**

Wetland name or number Wet E

SC 6.0 Interdunal Wetlands ***(see p. 93)*** Is the wetland unit west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ☐ YES - go to SC 6.1 NO ☑ not an interdunal wetland for rating ***If you answer yes you will still need to rate the wetland based on its functions.*** In practical terms that means the following geographic areas: ☐ Long Beach Peninsula- lands west of SR 103 ☐ Grayland-Westport- lands west of SR 105 ☐ Ocean Shores-Copalis- lands west of SR 115 and SR 109 SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is once acre or larger? ☐ YES = Category II ☐ NO – go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? ☐ YES = Category III	**Cat. II** ☐ **Cat. III** ☐
Category of wetland based on Special Characteristics *Choose the "highest" rating if wetland falls into several categories, and record on p. 1.* If you answered NO for all types enter "Not Applicable" on p.1	☐ Cat. I ☐ Cat. II ☐ Cat. III ☑ N/A

Wetland name or number Wetland F

WETLAND RATING FORM – WESTERN WASHINGTON
Version 2 - Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): Silverado - Wetland F Date of site visit: 06/21/2017

Rated by MK Trained by Ecology? Yes ☑ No ☐ Date of training 04/13

SEC: 29 TWNSHP: 24 RNGE: 6E Is S/T/R in Appendix D? Yes ☐ No ☑

Map of wetland unit: Figure ____ Estimated size 0.375 AC

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I ___ II ✔ III ___ IV ___

Category I = Score >=70
Category II = Score 51-69
Category III = Score 30-50
Category IV = Score < 30

Score for Water Quality Functions	18
Score for Hydrologic Functions	16
Score for Habitat Functions	19
TOTAL score for Functions	53

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ Does not Apply___

Final Category (choose the "highest" category from above) II

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above		Check if unit has multiple HGM classes present	☐

Wetland name or number Wetland F

Does the wetland unit being rated meet any of the criteria below?

If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered* ***animal or plant*** *species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.		✔
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered* ***animal*** *species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category I Natural Heritage Wetlands (see p. 19 of data form).		✔
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*		✔
SP4. *Does the wetland unit have a local significance in addition to its functions*? For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.		✔

To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Wetland name or number Wetland F

Classification of Wetland Units in Western Washington

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
☑ NO – go to 2 ☐ **YES** – the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe** ☐ **NO – Saltwater Tidal Fringe (Estuarine)** ☐

*If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is rated as an **Estuarine** wetland.* Wetlands that were called estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p.).

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
☑ NO – go to 3 ☐ **YES** – The wetland class is **Flats**

If your wetland can be classified as a "Flats" wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet both** of the following criteria?
___The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) at least 20 acres (8 ha) in size;
___At least 30% of the open water area is deeper than 6.6 ft (2 m)?
☑ NO – go to 4 ☐ **YES –** The wetland class is **Lake-fringe (Lacustrine Fringe)**

4. Does the entire wetland unit **meet all** of the following criteria?
____The wetland is on a slope (*slope can be very gradual*),
____The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
____The water leaves the wetland **without being impounded**?
NOTE: *Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than 1 foot deep).*
☑ NO - go to 5 ☐ **YES –** The wetland class is **Slope**

Wetland name or number Wetland F

5. Does the entire wetland unit **meet all** of the following criteria?

____ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river

____ The overbank flooding occurs at least once every two years.

NOTE: The riverine unit can contain depressions that are filled with water when the river is not flooding.

☑ NO - go to 6 ☐ **YES** – The wetland class is **Riverine**

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

☐ NO – go to 7 ☑ **YES –** The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding. The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

☐ NO – go to 8 ☐ **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within your wetland. NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM Classes within the wetland unit being rated	*HGM Class to Use in Rating*
Slope + Riverine ☐	Riverine ☐
Slope + Depressional ☐	Depressional ☐
Slope + Lake-fringe ☐	Lake-fringe ☐
Depressional + Riverine along stream within boundary ☐	Depressional ☐
Depressional + Lake-fringe ☐	Depressional ☐
Salt Water Tidal Fringe and any other class of freshwater wetland ☐	Treat as ESTUARINE under wetlands with special characteristics ☐

If you are unable still to determine which of the above criteria apply to your wetland, or if you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

Wetland name or number Wetland F

D	**Depressional and Flats Wetlands** **WATER QUALITY FUNCTIONS** - Indicators that the wetland unit functions to improve water quality	**Points** (only 1 score per box)
D	**D 1. Does the wetland unit have the <u>potential</u> to improve water quality?**	***(see p.38)***
D	D 1.1 Characteristics of surface water flows out of the wetland: ☐ Unit is a depression with no surface water leaving it (no outlet) points = 3 ☑ Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2 ☐ Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) points = 1 ☐ Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch points = 1 (*If ditch is not permanently flowing treat unit as "intermittently flowing"*) Provide photo or drawing	**Figure** ___ 2
D	S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic *(use NRCS definitions)* ☐ YES points = 4 ☑ NO points = 0	0
D	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class) ☑ Wetland has persistent, ungrazed, vegetation > = 95% of area points = 5 ☐ Wetland has persistent, ungrazed, vegetation > = 1/2 of area points = 3 ☐ Wetland has persistent, ungrazed vegetation > = 1/10 of area points = 1 ☐ Wetland has persistent, ungrazed vegetation <1/10 of area points = 0 Map of Cowardin vegetation classes	**Figure** ___ 5
D	D1.4 Characteristics of seasonal ponding or inundation. *This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.* ☐ Area seasonally ponded is > ½ total area of wetland points = 4 ☑ Area seasonally ponded is > ¼ total area of wetland points = 2 ☐ Area seasonally ponded is < ¼ total area of wetland points = 0 Map of Hydroperiods	**Figure** ___ 2
D	**Total for D 1** *Add the points in the boxes above*	9
D	**D 2. Does the wetland unit have the <u>opportunity</u> to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ☐ Grazing in the wetland or within 150 ft ☐ Untreated stormwater discharges to wetland ☐ Tilled fields or orchards within 150 ft of wetland ☐ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging ☑ Residential, urban areas, golf courses are within 150 ft of wetland ☐ Wetland is fed by groundwater high in phosphorus or nitrogen ☐ Other_____ ☑ **YES** multiplier is **2** ☐ **NO** multiplier is **1**	***(see p. 44)*** multiplier 2
D	**<u>TOTAL</u> - Water Quality Functions** Multiply the score from D1 by D2 ***Add score to table on p. 1***	18

Wetland name or number Wetland F

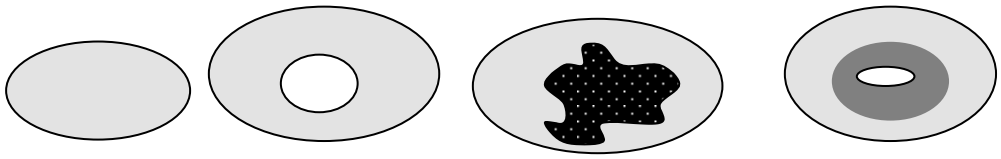
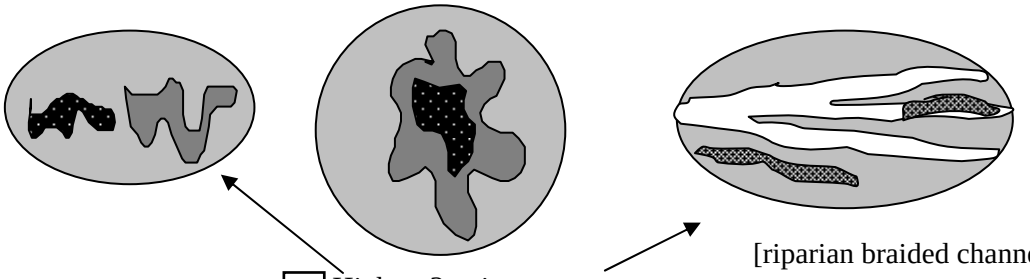
D	**Depressional and Flats Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation	**Points** (only 1 score per box)
	D 3. Does the wetland unit have the <u>potential</u> to reduce flooding and erosion?	***(see p.46)***
D	D 3.1 Characteristics of surface water flows out of the wetland unit ☐ Unit is a depression with no surface water leaving it (no outlet) points = 4 ☑ Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2 ☐ Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch points = 1 (*If ditch is not permanently flowing treat unit as "intermittently flowing"*) ☐ Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) points = 0	2
D	D 3.2 Depth of storage during wet periods *Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).* ☐ Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7 ☐ The wetland is a "headwater" wetland" points = 5 ☐ Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5 ☑ Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3 ☐ Unit is flat (yes to Q. 2 or Q. 7 on key) but has small depressions on the surface that trap water points = 1 ☐ Marks of ponding less than 0.5 ft points = 0	3
D	D 3.3 Contribution of wetland unit to storage in the watershed *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* ☐ The area of the basin is less than 10 times the area of unit points = 5 ☑ The area of the basin is 10 to 100 times the area of the unit points = 3 ☐ The area of the basin is more than 100 times the area of the unit points = 0 ☐ Entire unit is in the FLATS class points = 5	3
D	**Total for D 3** *Add the points in the boxes above*	8
D	**D 4. Does the wetland unit have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* ☐ Wetland is in a headwater of a river or stream that has flooding problems ☑ Wetland drains to a river or stream that has flooding problems ☐ Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems ☐ Other_____ ☑ **YES** multiplier is **2** ☐ **NO** multiplier is **1**	***(see p. 49)*** multiplier 2
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 ***Add score to table on p. 1***	16

Wetland name or number Wetland F

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit have the potential to provide habitat for many species?	
H 1.1 Vegetation structure ***(see p. 72)*** *Check the types of vegetation classes present (as defined by Cowardin)- Size threshold for each class is ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.* ☐ Aquatic bed ☐ Emergent plants ☐ Scrub/shrub (areas where shrubs have >30% cover) ☑ Forested (areas where trees have >30% cover) *If the unit has a forested class check if:* ☑ The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation structures that qualify. If you have:* ☐ 4 structures or more points = 4 ☐ 3 structures points = 2 ☑ 2 structures points = 1 ☐ 1 structure points = 0 Map of Cowardin vegetation classes	**Figure ___** 1
H 1.2. Hydroperiods ***(see p. 73)*** *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ☐ Permanently flooded or inundated — ☐ 4 or more types present points = 3 ☑ Seasonally flooded or inundated — ☑ 3 types present points = 2 ☐ Occasionally flooded or inundated — ☐ 2 types present point = 1 ☑ Saturated only — ☐ 1 type present points = 0 ☑ Permanently flowing stream or river in, or adjacent to, the wetland ☐ Seasonally flowing stream in, or adjacent to, the wetland ☐ ***Lake-fringe wetland* = 2 points** ☐ ***Freshwater tidal wetland* = 2 points** Map of hydroperiods	**Figure ___** 2
H 1.3. Richness of Plant Species ***(see p. 75)*** Count the number of plant species in the wetland that cover at least 10 ft^2. (*different patches of the same species can be combined to meet the size threshold)* *You do not have to name the species.* *Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle* If you counted: ☐ > 19 species points = 2 ☑ 5 - 19 species points = 1 ☐ < 5 species points = 0 *List species below if you want to:*	1

Total for page 4

Wetland name or number Wetland F

H 1.4. Interspersion of habitats ***(see p. 76)*** Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  ☐ None = 0 points ☑ Low = 1 point ☐ Moderate = 2 points  [riparian braided channels] ☐ High = 3 points NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes	**Figure ___** 1
H 1.5. Special Habitat Features: ***(see p. 77)*** *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ☑ Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). ☑ Standing snags (diameter at the bottom > 4 inches) in the wetland ☑ Undercut banks are present for at least 6.6 ft (2m) and/or overhanging vegetation extends at least 3.3 ft (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft (10m) ☐ Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* ☐ At least ¼ acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated.*(structures for egg-laying by amphibians)* ☐ Invasive plants cover less than 25% of the wetland area in each stratum of plants *NOTE: The 20% stated in early printings of the manual on page 78 is an error.*	3
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	8

Comments

Wetland name or number Wetland F

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
H 2.1 Buffers ***(see p. 80)*** *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."* ☐ 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer**.** (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** ☑ 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** ☐ 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** ☐ 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** ☐ 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** ☐ No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** ☐ No paved areas or buildings within 50m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** ☐ Heavy grazing in buffer. **Points = 1** ☐ Vegetated buffers are <2m wide (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0**. ☐ Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	**Figure ___** 4
H 2.2 Corridors and Connections ***(see p. 81)*** H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft wide, has at least 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? (*dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor*). ☐ YES = **4 points** (*go to H 2.3*) ☑ NO = go to H 2.2.2 H 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? ☐ YES = **2 points** (*go to H 2.3*) ☑ NO = H 2.2.3 H 2.2.3 Is the wetland: ☐ within 5 mi (8km) of a brackish or salt water estuary OR ☐ within 3 mi of a large field or pasture (>40 acres) OR ☐ within 1 mi of a lake greater than 20 acres? ☐ YES = **1 point** ☑ NO = **0 points**	0

Total for page 4

Wetland name or number Wetland F

H 2.3 Near or adjacent to other priority habitats listed by WDFW ***(see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report http://wdfw.wa.gov/hab/phslist.htm)*** Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* ☐ **Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre). ☐ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report p. 152*). ☐ **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock. ☑ **Old-growth/Mature forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age. **(**Mature forests) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest. ☐ **Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158*). ☑ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other. ☐ **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161*). ☑ **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources. ☐ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report: pp. 167-169 and glossary in Appendix A).* ☐ **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human. ☐ **Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft. ☐ **Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ☑ **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long. ☑ If wetland has **3 or more** priority habitats **= 4 points** ☐ If wetland has **2** priority habitats = **3 points** ☐ If wetland has **1** priority habitat **= 1 point** ☐ No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	4

Wetland name or number Wetland F

H 2.4 Wetland Landscape *(choose the **one** description of the landscape around the wetland that best fits)* ***(see p. 84)*** ☐ There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 ☐ The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 ☑ There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 ☐ The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 ☐ There is at least 1 wetland within ½ mile. points = 2 ☐ There are no wetlands within ½ mile. points = 0	3
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	11
TOTAL for H 1 from page 14	8
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	19

Wetland name or number Wetland F

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate answers and Category.

Wetland Type *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	**Category**
SC 1.0 Estuarine wetlands ***(see p. 86)*** Does the wetland unit meet the following criteria for Estuarine wetlands? ☐ The dominant water regime is tidal, ☐ Vegetated, and ☐ With a salinity greater than 0.5 ppt. ☐ YES = Go to SC 1.1 NO ☑ =Go to SC 2.0	
SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? ☐ YES = Category I ☐ NO go to SC 1.2	**Cat. I** ☐
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three conditions? ☐ YES = Category I ☐ NO = Category II ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native *Spartina* spp. are the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. ☐ The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	☐ **Cat. I** ☐ **Cat. II** ☐ **Dual rating I/II**

Wetland name or number Wetland F

SC 2.0 Natural Heritage Wetlands ***(see p. 87)*** Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? *(this question is used to screen out most sites before you need to contact WNHP/DNR)* S/T/R information from Appendix D [✔] or accessed from WNHP/DNR web site [ ] YES [ ] – contact WNHP/DNR (see p. 79) and go to SC 2.2 NO [✔] SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? [ ] YES = Category I NO [✔] not a Heritage Wetland	[ ] **Cat. I**
SC 3.0 Bogs ***(see p. 87)*** Does the wetland unit (**or any part of the unit**) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 [ ] [✔] No - go to Q. 2 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? [ ] Yes - go to Q. 3 [✔] No - Is not a bog for purpose of rating 3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)? [ ] Yes – Is a bog for purpose of rating [ ] No - go to Q. 4 NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. [ ] YES = Category I No [✔] Is not a bog for purpose of rating	[ ] **Cat. I**

Wetland name or number Wetland F

SC 4.0 Forested Wetlands *(see p. 90)* Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *If you answer yes you will still need to rate the wetland based on its functions.* ☐ **Old-growth forests**: (west of Cascade crest) Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm) or more. NOTE: The criterion for dbh is based on measurements for upland forests. Two-hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The DFW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter. ☐ **Mature forests**: (west of the Cascade Crest) Stands where the largest trees are 80 – 200 years old OR have average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth. ☐ YES = Category I NO ☑ not a forested wetland with special characteristics	**Cat. I** ☐
SC 5.0 Wetlands in Coastal Lagoons *(see p. 91)* Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? ☐ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks ☐ The lagoon in which the wetland is located contains surface water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* ☐ YES = Go to SC 5.1 NO ☑ not a wetland in a coastal lagoon SC 5.1 Does the wetland meets all of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of invasive plant species (see list of invasive species on p. 74). ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. ☐ The wetland is larger than 1/10 acre (4350 square feet) ☐ YES = Category I ☐ NO = Category II	☐ **Cat. I** ☐ **Cat. II**

Wetland name or number Wetland F

SC 6.0 Interdunal Wetlands ***(see p. 93)*** Is the wetland unit west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ☐ YES - go to SC 6.1 NO ☑ not an interdunal wetland for rating ***If you answer yes you will still need to rate the wetland based on its functions.*** In practical terms that means the following geographic areas: ☐ Long Beach Peninsula- lands west of SR 103 ☐ Grayland-Westport- lands west of SR 105 ☐ Ocean Shores-Copalis- lands west of SR 115 and SR 109 SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is once acre or larger? ☐ YES = Category II ☐ NO – go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? ☐ YES = Category III	**Cat. II** ☐ **Cat. III** ☐
Category of wetland based on Special Characteristics *Choose the "highest" rating if wetland falls into several categories, and record on p. 1.* If you answered NO for all types enter "Not Applicable" on p.1	☐ Cat. I ☐ Cat. II ☐ Cat. III ☑ N/A

APPENDIX C

KING COUNTY BOND
QUANTITY WORKSHEET

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King County

Critical Areas Mitigation
Bond Quantity Worksheet

Burnstead - Tibbetts Creek Crossing **Date:** **11-Jul-19** **Prepared by:** **TA, MK**

Project Number: **Project Description: Buffer Enhancement**

Location: 7932 Renton-Issaquah Rd SE, Issaquah, WA **Applicant:** **Steve Burnstead Construction, LLC** **Phone:** **425.454.1900**

PLANT MATERIALS*

Type	Unit Price	Unit	Quantity	Description	Cost
PLANTS: Potted, 4" diameter, medium	$5.00	Each			$ -
PLANTS: Container, 1 gallon, medium soil	$11.50	Each	41.00		$ 471.50
PLANTS: Container, 2 gallon, medium soil	$20.00	Each			$ -
PLANTS: Container, 5 gallon, medium soil	$36.00	Each			$ -
PLANTS: Seeding, by hand	$0.50	SY			$ -
PLANTS: Slips (willow, red-osier)	$2.00	Each			$ -
PLANTS: Stakes (willow)	$2.00	Each			$ -
PLANTS: Stakes (willow)	$2.00	Each			$ -
PLANTS: Flats/plugs	$2.00	Each			$ -
					$ -
* All costs include installation				*TOTAL*	**$ 471.50**

INSTALLATION COSTS (LABOR, EQUIPMENT, & OVERHEAD)

Type	Unit Price	Unit			Cost
Compost, vegetable, delivered and spread	$37.88	CY			$ -
Decompacting till/hardpan, medium, to 6" depth	$1.57	CY			$ -
Decompacting till/hardpan, medium, to 12" depth	$1.57	CY			$ -
Hydroseeding	$0.51	SY			$ -
Labor, general (landscaping)	$40.00	HR	8.00		$ 320.00
Labor, general (construction)	$40.00	HR			$ -
Labor: Consultant, supervising	$55.00	HR			$ -
Labor: Consultant, on-site re-design	$95.00	HR			$ -
Rental of decompacting machinery & operator	$70.00	HR			$ -
Sand, coarse builder's, delivered and spread	$42.00	CY			$ -
Staking material (set per tree)	$7.00	Each			$ -
Surveying, line & grade	$250.00	HR			$ -
Surveying, topographical	$250.00	HR			$ -
Watering, 1" of water, 50' soaker hose	$3.62	MSF			$ -
Irrigation - temporary	$3,000.00	Acre	0.02		$ 66.00
Irrigation - buried	$4,500.00	Acre			$ -
Tilling topsoil, disk harrow, 20hp tractor, 4"-6" deep	$1.02	SY			$ -
	$25.00	HR			$ -
					$ -
				TOTAL	**$ 386.00**

HABITAT STRUCTURES*

ITEMS	Unit Cost	Unit			Cost
Fascines (willow)	$ 2.00	Each			$ -
Logs, (cedar), w/ root wads, 16"-24" diam., 30' long	$1,000.00	Each			$ -
Logs (cedar) w/o root wads, 16"-24" diam., 30'	$400.00	Each			$ -
Logs, w/o root wads, 16"-24" diam., 30' long	$245.00	Each			$ -
Logs w/ root wads, 16"-24" diam., 30' long	$460.00	Each			$ -
Rocks, one-man	$60.00	Each			$ -
Rocks, two-man	$120.00	Each			$ -
Root wads	$163.00	Each			$ -
Spawning gravel, type A	$22.00	CY			$ -
Weir - log	$1,500.00	Each			$ -
Weir - adjustable	$2,000.00	Each			$ -
Woody debris, large	$163.00	Each			$ -
Snags - anchored	$400.00	Each			$ -
Snags - on site	$50.00	Each			$ -
Snags - imported	$800.00	Each			$ -
					$ -
					$ -
* All costs include delivery and installation				*TOTAL*	**$ -**

EROSION CONTROL

ITEMS	Unit Cost	Unit			Cost
Backfill and Compaction-embankment	$ 4.89	CY			$ -
Crushed surfacing, 1 1/4" minus	$30.00	CY			$ -
Ditching	$7.03	CY			$ -
Excavation, bulk	$4.00	CY			$ -
Fence, silt	$1.60	LF	2432.00		$ 3,891.20
Jute Mesh	$1.26	SY			$ -
Mulch, by hand, straw, 2" deep	$1.27	SY			$ -
Mulch, by hand, wood chips, 2" deep	$3.25	SY	10.00		$ 32.50
Mulch, by machine, straw, 1" deep	$0.32	SY			$ -
Piping, temporary, CPP, 6"	$9.30	LF			$ -
Piping, temporary, CPP, 8"	$14.00	LF			$ -
Piping, temporary, CPP, 12"	$18.00	LF			$ -
Plastic covering, 6mm thick, sandbagged	$2.00	SY			$ -
Rip Rap, machine placed, slopes	$33.98	CY			$ -
Rock Constr. Entrance 100'x15'x1'	$3,000.00	Each			$ -
Rock Constr. Entrance 50'x15'x1'	$1,500.00	Each			$ -
Sediment pond riser assembly	$1,695.11	Each			$ -
Sediment trap, 5' high berm	$15.57	LF			$ -
Sediment trap, 5' high berm w/spillway incl. riprap	$59.60	LF			$ -
Sodding, 1" deep, level ground	$5.24	SY			$ -
Sodding, 1" deep, sloped ground	$6.48	SY			$ -
Straw bales, place and remove	$600.00	TON			$ -
Hauling and disposal	$20.00	CY			$ -
Topsoil, delivered and spread	$35.73	CY			$ -
	$17.00	CY			$ -
					$ -
				TOTAL	**$ 3,923.70**

GENERAL ITEMS

ITEMS	Unit Cost	Unit			Cost
Fencing, chain link, 6' high	$18.89	LF			$ -
Fencing, chain link, corner posts	$111.17	Each			$ -
Fencing, chain link, gate	$277.63	Each			$ -
Fencing, split rail, 3' high (2-rail)	$10.54	LF	2432.00		$ 25,633.28
Fencing, temporary (NGPE)	$1.20	LF	2432.00		$ 2,918.40
Signs, sensitive area boundary (inc. backing, post, install)	$28.50	Each	20.00		$ 570.00
					$ -
					$
					$ -
				TOTAL	**$ 29,121.68**
				(Construction Cost Subtotal)	**$ 33,902.88**

OTHER

ITEMS	Percentage of Construction Cost	Unit			Cost
Mobilization	10%	1			$ 3,390.29
Contingency	30%	1			$ 10,170.86
				TOTAL	**$ 13,561.15**

MAINTENANCE AND MONITORING

NOTE: Projects with multiple permit requirements may be required to have longer monitoring and maintenance terms. This will be evaluated on a case-by-case basis for development applications. Monitoring and maintance ranges may be assessed anywhere from 5 to 10 years.

Maintenance, annual					
Less than 1,000 sq.ft. and buffer mitigation only	$ 1.08	SF	955.00	(3 X SF total for 3 annual events; Includes monitoring)	$ 1,031.40
Less than 1,000 sq.ft. with wetland or aquatic area mitigation	$ 1.35	SF		(3 X SF total for 3 annual events; Includes monitoring)	$ -
Larger than 1,000 sq. ft. but less than 5,000 sq.ft. of buffer mitigation	$ 180.00	EACH		(4hr @$45/hr)	$ -
Larger than 1,000 sq. ft. but less than 5,000 sq.ft. of wetland or aquatic area mitigation	$ 270.00	EACH		(6hr @$45/hr)	$ -
Larger than 5,000 sq.ft. but < 1 acre -buffer mitigation only	$ 360.00	EACH		(8 hrs @ 45/hr)	$ -
Larger than 5,000 sq.ft. but < 1 acre with wetland or aquatic area mitigation	$ 450.00	EACH		(10 hrs @ $45/hr)	$ -
Larger than 1 acre but < 5 acres - buffer and / or wetland or aquatic area mitigation	$ 1,600.00	DAY		(WEC crew)	$ -
Larger than 5 acres - buffer and / or wetland or aquatic area mitigation	$ 2,000.00	DAY		(1.25 X WEC crew)	$ -
Monitoring, annual					
Larger than 1,000 sq.ft. but less than 5,000 wetland or buffer mitigation	$ 720.00	EACH	6.30	(8 hrs @ 90/hr)	$ 4,536.00
Larger than 5,000 sq.ft. but < 1 acre with wetland or aquatic area impacts	$ 900.00	EACH		(10 hrs @ $90/hr)	$ -
Larger than 1 acre but < 5 acres - buffer and / or wetland or aquatic area impacts	$ 1,440.00	DAY		(16 hrs @ $90/hr)	$ -
Larger than5 acres - buffer and / or wetland or aquatic area impacts	$ 2,400.00	DAY		(24 hrs @ $90/hr)	$ -
Maintenance and Monitoring Inspection (DDES), annual	$362.25	EACH		(2.5 hrs @ $144.90/hr)	$ -
Maintenance and Monitoring Inspection (DDES), final	$579.60	EACH		(4 hrs @ $144.90/hr)	$ -
				TOTAL	**$ 5,567.40**

Total	**$53,031.43**

APPENDIX D

CRITICAL AREAS STUDY
MAPS
(SHEET 1/2, SHEET 2/2)

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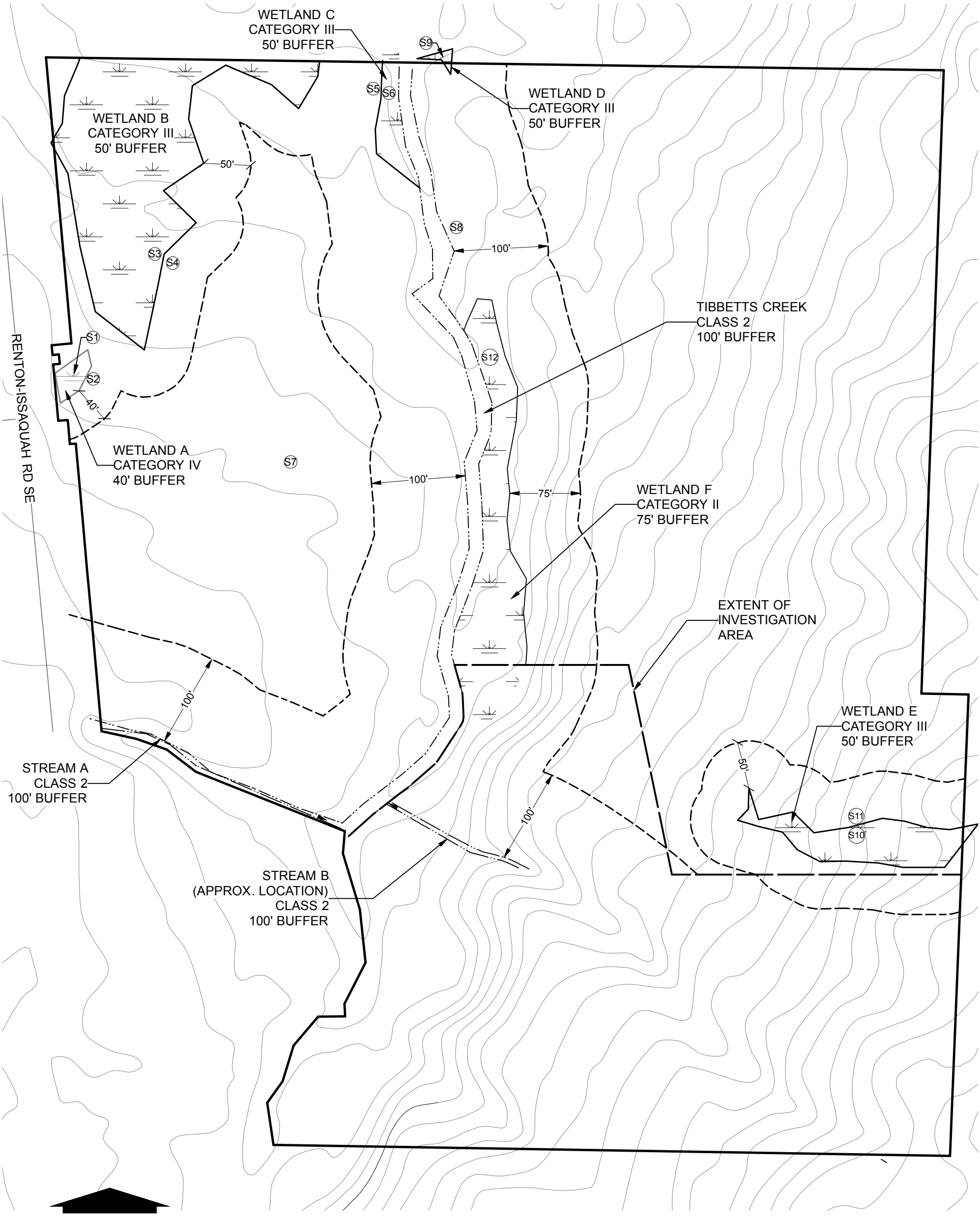
CRITICAL AREAS STUDY MAP - EXISTING CONDITIONS

STEVE BURNSTEAD CONSTRUCTION - TIBBETTS CREEK CROSSING

PORTION OF SECTION 28, TOWNSHIP 24N, RANGE 06E, W.M.



Scale 1" = 100'

0 50 100 150 300

LEGEND

WETLAND	BUFFER
PROPERTY BOUNDARY	INVESTIGATION AREA
STREAM	S1–S12 DATA SITES

Wetland Resources, Inc.
Delineation / Mitigation / Restoration / 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 Areas Study Map - Ex. Conditions
Steve Burnstead Construction
Tibbetts Creek Crossing
City of Issaquah

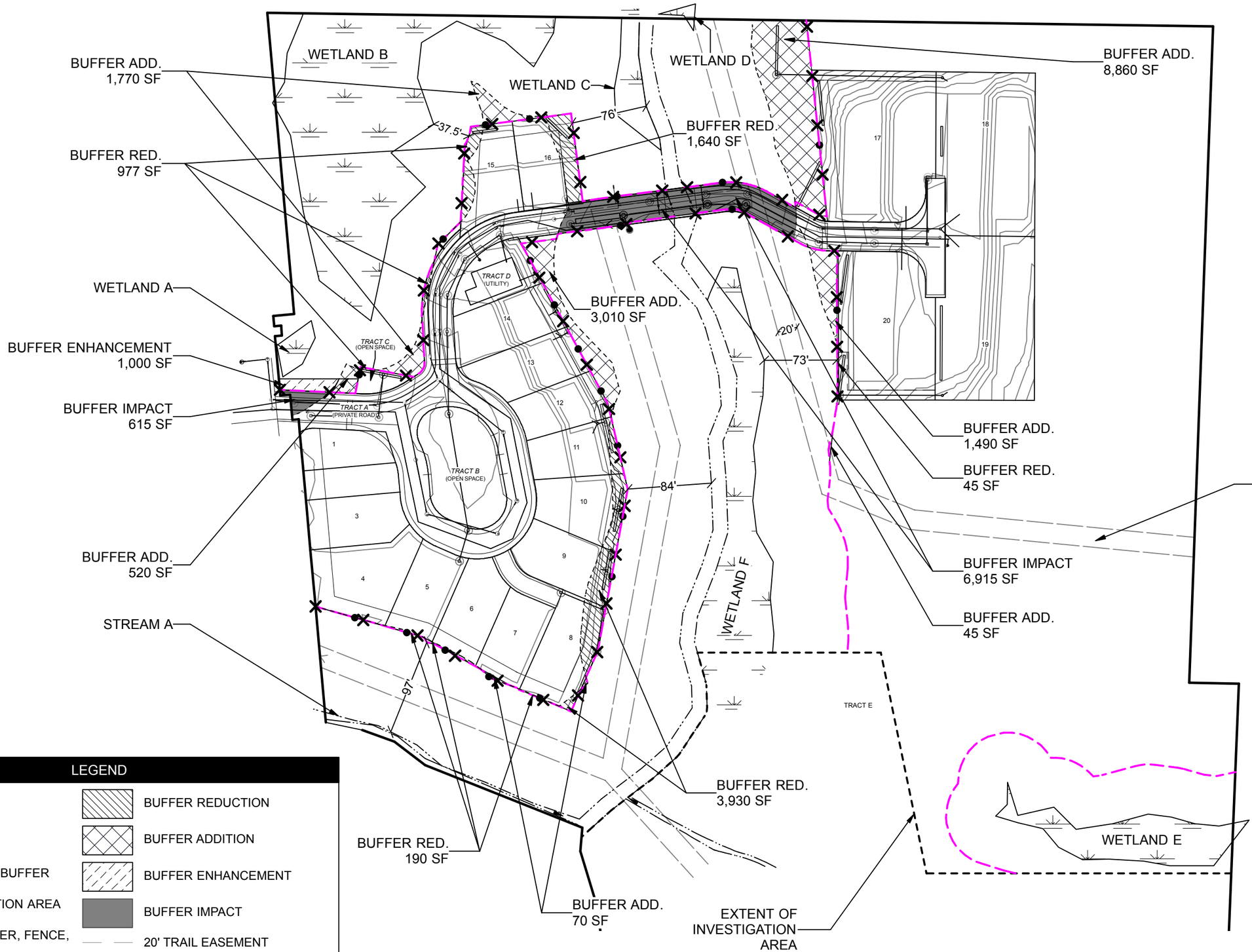
Steve Burnstead
Construction LLC
Attn: Leo Suver
11980 NE 24th St, #200
Bellevue, WA 98005

Sheet 1/1
WRI Job#: 17173
Drawn by: TA
Date: 7/11/2019

CRITICAL AREAS STUDY MAP - BUFFER MITIGATION PLAN

STEVE BURNSTEAD CONSTRUCTION - TIBBETTS CREEK CROSSING

PORTION OF SECTION 28, TOWNSHIP 24N, RANGE 06E, W.M.



Scale 1" = 100'

0 50 100 150 300

LEGEND

- WETLAND
- STREAM
- STANDARD BUFFER
- INVESTIGATION AREA
- FINAL BUFFER, FENCE, SIGNS
- BUFFER REDUCTION
- BUFFER ADDITION
- BUFFER ENHANCEMENT
- BUFFER IMPACT
- 20' TRAIL EASEMENT

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CAS Map - Buffer Mitigation Plan
Steve Burnstead Construction - Tibbetts Creek Crossing
City of Issaquah

Steve Burnstead
Construction LLC
Attn: Leo Suver
11980 NE 24th St, #200
Bellevue, WA 98005

Sheet 2/2
WRI Job#: 17173
Drawn by: TA
Date: 7/11/2019

Lonnson Arbor Care
2616 169th Street SE
Bothell, WA 98012
425-891-1741
lonnson@juno.com

November 9, 2019

Tibbetts Crossing
Suver & Burnstead Homes
7932 Renton-Issaquah Rd SE
Issaquah, WA 98027

Re: **Tree Report & Inventory** for the address mentioned above (Addendum).

To Whom It May Concern,

This letter is to be added to the original Tree Report and Inventory for the address mentioned above, dated July 9, 2018. The area of development with the current site plans has changed from the preliminary plans. The preliminary plans assumed an area of 11.5 acres for development. The current development plans equates to 10.67 acres. The percentage of viable trees to retain over the entire site is calculated below, not including critical areas and wetland buffers. The following site map shows the viable trees to be removed from the forested area.

The forested area east of Tibbetts Creek (wetland buffer) is measured to be about 246,400 square feet (5.7 acres). The planned area of development for the forest area is 1.57 acres. There is 1,470.7 diameter inches (dia. in.) of viable trees within the 1.57 acres. The estimated amount of viable trees in the forested area is 936.8 dia. in./acre (1,470.7 dia. in. / 1.57 acre = 936.8 dia. in./acre), or 5,339.8 dia. in. (936.8 dia. in./acre x 5.7 acres = 5339.8 dia. in.) in the forested area.

There is 81.5 dia. in. of viable trees in the pasture area, west of Tibbetts Creek. The total number of viable trees within the development area of 10.67 acres is 1,552.2 dia. in. (1,470.7 dia. in. + 81.5 dia. in.).

Removal of 81.5 dia. in. of viable trees in the pasture area and removal of 1,470.7 dia. in. of viable trees in the forest are is equal to 1,552.2 dia. in. The estimated amount of viable trees on the entire site is 5,421.3 dia. in. (5,339.8 dia. in. [forest] + 81.5 dia. in. [pasture] = 5,421.3 dia. in.). The amount of viable trees to be retained for the entire site is equal to 71.4% [(5421.3 dia. in. – 1552.2 dia. in.) / 5421.3 dia. in. x 100% = 71.4%].

Please reply if you have questions.

Thank you,

Lonnie Olson

Lonnie Olson, Owner
ISA Certified Arborist (PN-5427A) exp. 12/31/2020
Qualified Tree Risk Assessor (#697) exp. 7/24/2023

Lonnson Arbor Care
2616 169th Street SE
Bothell, WA 98012
425-891-1741
lonnson@juno.com

July 9, 2018

Tibbetts Crossing
Suver & Burnstead Homes
7932 Renton-Issaquah Rd SE
Issaquah, WA 98027

Re: **Tree Report & Inventory** for the address mentioned above, including the surrounding pasture, stream, and forest land.

To Whom It May Concern,

The purpose of this report is to document the location, identification, size and viability of each significant tree on the above-mentioned land. This report also assesses tree densities, retention, and replacement. The City of Issaquah defines "significant" trees as being more than 6 inches in trunk diameter, 4 ½ feet from existing grade.

I inspected 171 tagged "significant" trees on the property mentioned above on June 13th, 2018. Measurements of trunk diameters were taken with a tree diameter tape. The trunk Diameter at Standard Height (DSH), 4 ½ feet from the ground, of the 171 trees are recorded in the tree survey table on the next page, which also includes species, hazard assessments, **windthrow**, and the following. The Limit of Disturbance (LOD) noted for each tree is the radius around the tree trunk that should not be disturbed during grading and construction in order to preserve the root zone. The LOD includes the terms known as critical root zone, critical root mass, outer root zone, or **dripline**. The LOD is determined by the tree species, its dripline, DSH, surrounding conditions, and slope. A tree's viability for retention depends on its likelihood for survival (> 10 years), and the amount of hazards or defects that would be detrimental to tree health, people, or property in the future.

Hazard assessment is categorized into four types of risk within a five year period; *improbable*, *possible*, *probable*, and *imminent*. *Improbable* risk means the tree is stable, void of defects, and highly unlikely to fail, even under severe weather conditions. *Possible* risk means there is a defect with the tree that may suggest the tree is somewhat likely to fail. *Probable* risk means the tree or part of the tree is very likely to fail within a given time. Trees with *imminent* risk should be worked on as soon as possible.

The number within the brackets [ ] in the inventory table is the total DSH for multiple trunks derived from the total area in square inches, 4 ½ feet from grade. DSH = [$\sqrt{}$ (Area / π)] x 2.

Tree Inventory Table:

Tag #	Species	DSH	LOD	Viable	Condition
8042	Red cedar *Thuja plicata*	53.0	30.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8042-A	Red alder *Alnus rubra*	17.5”	13.0’	No	Severe decay within the trunk. *Probable* risk of whole tree failure.
8043	Red alder	20.5”	15.0’	Yes	Sturdy tree with no signs of disease or decay. U-shaped crotch development suggests *possible* large part failures.
8061	Red alder	14.0”	10.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8062	Red alder	15.5”	12.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8063	Big-leaf maple *Acer macrophyllum*	31.0”	23.0’	Yes	Sturdy tree with no signs of disease or decay. Deep crotch development suggests *possible* large part failures.
8064	Red cedar	22.5”	16.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8065	Red alder	13.0”	9.0’	No	Alder tree is pushed aside by fallen tree. Foliage is thin. *Possible* whole tree failure. Susceptible to windthrow.
8066	Red alder	11.5” 12.0” [16.6”]	12.0’	Yes	Sturdy tree with no signs of disease or decay. Deep crotch development suggests *possible* large part failures.
8067	Red alder	22.0”	16.0’	No	Excessive dead branching with a dead side stem. Probable whole tree failure. Susceptible to windthrow.
8068	Red cedar	11.5”	9.0’	Yes	Sturdy tree with no signs of decay. Exposed sapwood at the base of the trunk. Improbable risk of failures.
8069	Red cedar	40.3”	30.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8070	Big-leaf maple	29.5”	22.0’	No	Deep main crotch with included bark and bulging reaction wood on both sides. *Probable* break at the main crotch. Susceptible to windthrow.
8071	Big-leaf maple	14.0”	10.0’	Yes	Sturdy tree with no signs of decay or disease. Asymmetric canopy to the west. *Possible* large part failures.
8072	Big-leaf maple	20.5” 21.0” 17.5” 18.0” [38.6”]	25.0’	Yes	Sturdy tree with no signs of disease or decay. Deep crotch development suggests *possible* large part failures.

Tag #	Species	DSH	LOD	Viable	Condition
8074	Big-leaf maple	28.5”	20.0’	Yes	Sturdy tree with no signs of disease or decay. Deep crotch development suggests *possible* large part failures.
8076	Big-leaf maple	13.5”	10.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8077	Red cedar	53.0”	40.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8078	Red cedar	43.0”	30.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8079	Red cedar	16.0”	12.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8080	Douglas fir *Psuedotsuga menziesii*	29.0”	22.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8081	Douglas fir	13.0”	9.0’	No	Mostly dead and very susceptible to windthrow. *Probable* whole tree failure.
8082	Red cedar	16.5”	12.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8083	Douglas fir	33.0’	24.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8084	Big-leaf maple	11.0”	8.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8085	Douglas fir	34.0”	25.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8086	Big-leaf maple	12.0”	9.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8087	Douglas fir	36.3”	25.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8088	Douglas fir	23.0”	17.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8089	Red cedar	18.5”	14.0’	No	Decay within the trunk. Co-dominant with poor union. *Probable* large part failure.
8091	Red cedar	25.0”	18.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8093	Douglas fir	42.0”	30.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.

Tag #	Species	DSH	LOD	Viable	Condition
8094	Red cedar	19.5”	14.0’	Yes	Sturdy tree with exposed sapwood along the trunk. No signs of decay. Spiked stem off main trunk. *Possible* large part failure.
8095	Red cedar	20.0”	15.0’	Yes	Sturdy tree with co-dominant top canopy. No signs of decay or disease. *Possible* large part failure.
8096	Douglas fir	23.0”	17.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8097	Douglas fir	35.0”	26.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8098	Big-leaf maple	12.0”	9.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. Asymmetric canopy. *Improbable* risk of failures.
8099	Douglas fir	30.5”	22.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8100	Red cedar	13.0” 26.5” [29.6”]	22.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8101	Big-leaf maple	12.0” 28.5” [31.0”]	23.0’	No	Severe decay within the trunk. ***Imminent*** failure.
8102	Big-leaf maple	16.0”	12.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. Asymmetric canopy. *Improbable* risk of failures.
8103	Red alder	11.5”	8.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8104	Red alder	9.5”	6.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8105	Red alder	17.5”	13.0’	No	J-shaped trunk with poor root to trunk development. Susceptible to windthrow. *Probable* whole tree failure.
8107	Douglas fir	36.0”	27.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8108	Douglas fir	42.0”	32.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8109	Red cedar	23.0”	17.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8110	Red cedar	18.0”	13.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.

Tag #	Species	DSH	LOD	Viable	Condition
8111	Red cedar	60.0”	40.0’	Yes	Sturdy tree with no signs of disease or decay. Co-dominant stems with strong union. *Improbable* risk of failures.
8112	Red cedar	54.2”	35.0’	Yes	Sturdy tree with no signs of disease or decay. Co-dominant stems with strong union. *Improbable* risk of failures.
8113	Red cedar	11.0”	8.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8115	Douglas fir	25.0”	18.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8116	Douglas fir	29.0”	22.0’	No	Tree has slight lean and asymmetric canopy to the SW due to neighboring trees. Susceptible to windthrow if exposed. *Improbable* risks of failure under current conditions.
8117	Douglas fir	27.0”	20.0’	No	Tree has J-shaped trunk and dead branching. Susceptible to windthrow if exposed. *Possible* risks of failure under current conditions.
8118	Douglas fir	31.0”	23.0’	No	Tree has severe crook about 40’ up the trunk. Susceptible to windthrow if exposed. *Possible* risks of failure under current conditions.
8119	Douglas fir	22.0”	16.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8120	Red cedar	43.0”	32.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8121	Douglas fir	27.5”	20.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8122	Douglas fir	19.5”	14.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8123	Douglas fir	31.0”	23.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8124	Douglas fir	23.0”	17.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8125	Douglas fir	24.0”	18.0’	No	Tree has a live canopy ratio less than 25%. Highly susceptible to windthrow if exposed. *Possible* risks of failure under current conditions.
8126	Douglas fir	27.5”	20.0’	No	Tree has a live canopy ratio less than 25%. Highly susceptible to windthrow if exposed. Asymmetric canopy. *Possible* risks of failure under current conditions.

Tag #	Species	DSH	LOD	Viable	Condition
8127	Red alder	14.5”	10.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8128	Red alder	11.0”	8.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8129	Red alder	11.5”	8.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8130	Red alder	14.0”	10.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8135	Red alder	15.0”	10.0’	No	Mostly dead.
8136	Red alder	14.0”	10.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8137	Red alder	15.0”	11.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8154	Red cedar	11.0”	8.0’	Yes	Sturdy tree with no signs of decay or disease. A seem present up the trunk. Improbable risk of failures.
8155	Red cedar	28.5”	21.0’	Yes	Sturdy tree with no signs of decay or disease. Co-dominant top canopy. *Possible* large part failure.
8156	Big-leaf maple	36.5” 38.5” [53.0’]	35.0’	Yes	Sturdy tree with no signs of disease or decay. Deep crotch development suggests *possible* large part failures.
8157	Big-leaf maple	23.0”	17.0’	No	No signs of decay. Dead branching and an asymmetric canopy. Susceptible to windthrow if exposed. *Possible* large part failures under current conditions.
8158	Big-leaf maple	31.5”	22.0’	No	No signs of decay. Asymmetric canopy. Susceptible to windthrow if exposed. *Possible* large part failures under current conditions.
8159	Red cedar	24.5”	18.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8160	Douglas fir	34.0”	25.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8161	Douglas fir	23.0”	17.0’	No	Tree has a crook about 25’ up the trunk. Susceptible to windthrow if exposed. *Possible* risks of failure under current conditions.
8162	Douglas fir	36.0”	27.0’	Yes	Sturdy tree with no signs of decay or disease. Spiked stem from the main trunk. *Possible* large part failure.

Tag #	Species	DSH	LOD	Viable	Condition
8163	Red cedar	38.5”	28.0’	Yes	Sturdy tree with a co-dominant canopy. Good union between stems. Dieback with the top of one stem. *Improbable* risk of failures.
8164	Big-leaf maple	38.5”	28.0’	Yes	No signs of decay. Asymmetric canopy. Susceptible to windthrow if exposed. *Possible* large part failures under current conditions.
8165	Douglas fir	43.5”	30.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8166	Big-leaf maple	21.0”	15.0’	No	The trunk is severely contorted with an asymmetric canopy. Highly susceptible to windthrow. *Probable* large part failures.
8167	Big-leaf maple	22.5”	16.0’	Yes	Sturdy tree with no signs of decay. Deep V-shaped main crotch. *Possible* large part failures.
8168	Big-leaf maple	21.0”	15.0’	No	Decay pockets along the stems and asymmetric canopy. Susceptible to windthrow if exposed. *Possible* large part failures under current conditions.
8169	Red cedar	11.5”	8.0’	No	J-shaped trunk. Poor root to trunk development. Susceptible to windthrow. *Possible* whole tree failure under current conditions.
8170	Douglas fir	36.0”	27.0’	Yes	Good root to trunk development with no signs of decay or disease. Asymmetric canopy. *Possible* large part failures.
8171	Douglas fir	18.0”	13.0’	No	Good root to trunk development with no signs of decay or disease. Asymmetric canopy. Susceptible to windthrow if exposed. *Possible* large part failures.
8172	Douglas fir	22.0”	16.0’	No	Live crown ration is less than 25% with thin foliage. Highly susceptible to windthrow. Probable whole tree failure.
8173	Red cedar	22.0” 11.0” [24.6”]	18.0’	Yes	Sturdy tree with good union between trunks. No signs of decay or disease. Improbable risk of failures.
8174	Red cedar	22.0”	16.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8175	Red cedar	15.5”	12.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8176	Red cedar	57.0”	40.0’	Yes	No signs of decay or disease. Co-dominant canopy with good union between stems. Some contorted stems. *Possible* large part failures.
8177	Douglas fir	35.5”	26.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.

Tag #	Species	DSH	LOD	Viable	Condition
8186	Douglas fir	34.5”	27.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8187	Douglas fir	16.5”	12.0’	No	Live crown ration is less than 25% with thin foliage. Highly susceptible to windthrow. Probable whole tree failure.
8188	Douglas fir	28.5”	21.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8189	Douglas fir	19.0”	14.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8190	Red cedar	15.0”	11.0’	No	Severe decay within the trunk. ***Imminent*** failure.
8192	Douglas fir	26.5”	20.0’	No	Co-dominant stem with V-shaped crotch. Susceptible to windthrow. *Possible* large part failure.
8193	Douglas fir	21.5”	16.0’	No	Live crown ration is less than 25% with thin foliage. Highly susceptible to windthrow. Probable whole tree failure.
8194	Douglas fir	27.0”	20.0’	No	Tree has crooked trunk about 30’ up. Susceptible to windthrow if exposed. *Possible* risks of failure under current conditions.
8195	Douglas fir	33.5”	25.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8196	Douglas fir	34.0”	25.0’	Yes	Sturdy tree with no signs of decay or disease. Asymmetric canopy. *Improbable* risk of failure.
8199	Big-leaf maple	26.0”	19.0’	Yes	Sturdy tree with no signs of decay or disease. Asymmetric canopy. *Improbable* risk of failure.
8214	Black walnut *Juglans nigra*	35.0”	28.0”	Yes	Sturdy tree with no signs of decay, disease, or structural defects. *Improbable* risk of failure.
8215	Black walnut	41.3”	30.0’	Yes	Sturdy tree with no signs of decay, disease, or structural defects. *Improbable* risk of failure.
8216	Apple *Malus sp*.	20.0”	10.0’	No	Severe decay throughout the trunk. *Probable* whole tree failure.
8217	Apple	31.0”	15.0’	No	Severe decay throughout the trunk. *Probable* whole tree failure.
8218	Red alder	18.0”	13.0’	Yes	Sturdy tree with no signs of decay, disease, or structural defects. *Improbable* risk of failure.
8219	Red alder	15.0”	11.0’	Yes	Sturdy tree with no signs of decay, disease, or structural defects. *Improbable* risk of failure.

Tag #	Species	DSH	LOD	Viable	Condition
8220	Red alder	14.0”	10.0’	Yes	Sturdy tree with no signs of decay, disease, or structural defects. *Improbable* risk of failure.
8221	Red alder	13.0”	9.0’	Yes	Sturdy tree with no signs of decay, disease, or structural defects. *Improbable* risk of failure.
8222	Red alder	18.5”	13.0’	Yes	Sturdy tree with no signs of decay or disease. Asymmetric canopy. Canopy heavy with honeysuckle vine. *Possible* whole tree failure.
8223	Red cedar	17.0”	13.0’	No	J-shaped trunk. Stream undercutting tree. Possible whole tree failure.
8224	Red alder	9.0”	6.0’	Yes	Sturdy tree with no signs of decay, disease, or structural defects. *Improbable* risk of failure.
8225	Red alder	13.5”	10.0’	Yes	Sturdy tree with no signs of decay, disease, or structural defects. *Improbable* risk of failure.
8226	Red alder	14.0”	10.0’	Yes	Sturdy tree with no signs of decay, disease, or structural defects. *Improbable* risk of failure.
8227	Red alder	11.0”	8.0’	Yes	Sturdy tree with no signs of decay, disease, or structural defects. *Improbable* risk of failure.
8228	Red alder	9.5”	6.0’	Yes	Sturdy tree with no signs of decay, disease, or structural defects. *Improbable* risk of failure.
8229	Red alder	8.0”	6.0’	Yes	Sturdy tree with no signs of decay, disease, or structural defects. *Improbable* risk of failure.
8230	Red alder	10.0”	7.0’	Yes	Sturdy tree with no signs of decay, disease, or structural defects. *Improbable* risk of failure.
8231	Red alder	15.0”	11.0’	Yes	Sturdy tree with no signs of decay, disease, or structural defects. *Improbable* risk of failure.
8232	Red alder	9.0”	6.0’	Yes	Sturdy tree with no signs of decay, disease, or structural defects. *Improbable* risk of failure.
8233	Cherry *Prunus sp*.	9.0” 11.0” 11.0” [14.2”]	11.0’	No	Canopy dieback. *Possible* large part failures.
8234	Cherry	21.0”	15.0’	No	Severe decay within the trunk. Canopy dieback. *Possible* large part failures.
8235	Red cedar	75.0”	-	No	Tree has broken apart at the trunk. *Probable* failure with the rest of the tree.

Tag #	Species	DSH	LOD	Viable	Condition
8236	Cherry	13.0” 13.0” 12.0” 12.0” [25.0”]	18.0’	Yes	Sturdy tree with no signs of decay or disease. Top canopy exhibits signs of stress. Thin foliage. *Improbable* risk of failures.
8237	Black walnut	46.0”	30.0’	No	Decay and disease within the trunk. Dead top canopy and branching. *Imminent* large part failure.
8238	Black walnut	33.5”	25.0’	No	Decay and disease within the trunk. Dead top canopy and branching. *Imminent* large part failure.
8239	Black walnut	11.5” 12.0” 13.0” 14.0” [25.4”]	19.0’	Yes	Sturdy tree with no signs of decay or disease. Good connection between crotches. *Improbable* risks of failure.
8240	Red alder	17.0”	12.0’	No	Large side branch has poor connection with included bark. Cavity on the trunk. *Probable* large part failures.
8241	Red alder	7.0” 8.5” [11.0”]	8.0’	Yes	Sturdy tree with no signs of decay or disease. Good connection between the U-shaped crotch. Improbable risk of failures.
8242	Red alder	8.0”	6.0’	Yes	Sturdy tree with no signs of decay, disease, or structural defects. *Improbable* risk of failure.
8243	Red alder	11.0”	8.0’	Yes	Sturdy tree with no signs of decay, disease, or structural defects. *Improbable* risk of failure.
8244	Cottonwood *Populus trichocarpa*	21.0”	15.0’	No	Large side branch has poor connection with included bark. *Probable* large part failures.
8245	Red alder	9.0”	6.0’	Yes	Sturdy tree with no signs of decay, disease, or structural defects. *Improbable* risk of failure.
8246	Red alder	14.0”	10.0’	Yes	Sturdy tree with no signs of decay, disease, or structural defects. *Improbable* risk of failure.
8247	Red alder	8.5”	6.0’	Yes	Sturdy tree with no signs of decay, disease, or structural defects. *Improbable* risk of failure.
8248	Red alder	10.0”	8.0’	Yes	Sturdy tree with no signs of decay, disease, or structural defects. *Improbable* risk of failure.
8249	Red alder	15.0”	11.0’	Yes	Sturdy tree with no signs of decay, disease, or structural defects. *Improbable* risk of failure.
8250	Big-leaf maple	15.0”	11.0’	Yes	Sturdy tree with no signs of decay, disease, or structural defects. *Improbable* risk of failure.

Tag #	Species	DSH	LOD	Viable	Condition
8251	Big-leaf maple	22.0”	16.5’	Yes	Sturdy tree with no signs of decay or disease. Contorted branching. *Possible* large part failures.
8252	Red cedar	27.5”	20.0’	Yes	Sturdy tree with no signs of decay or disease. Spiked stem/branch. *Possible* large part failure.
8254	Red cedar	9.0”	6.0’	No	Poor root to trunk development. Susceptible to windthrow. *Probable* risk of whole tree failure
8255	Western hemlock *Tsuga heterophylla*	12.0”	8.0’	No	Grows from a nurse log. No signs of decay or disease. Susceptible to windthrow. *Possible* risk of whole tree failure.
8256	Douglas fir	28.5”	20.0’	Yes	Sturdy tree with no signs of decay, disease, or structural defects. *Improbable* risk of failure.
8257	Douglas fir	37.0”	28.0’	Yes	Sturdy tree with no signs of decay, disease, or structural defects. *Improbable* risk of failure.
8258	Red cedar	15.0”	11.0’	No	Poor root to trunk development. Susceptible to windthrow if exposed. *Possible* whole tree failure under current conditions.
8259	Douglas fir	30.5”	22.0’	Yes	Sturdy tree with no signs of decay, disease, or structural defects. *Improbable* risk of failure.
8260	Red cedar	9.5”	7.0’	No	Severe lean and susceptible to windthrow. *Probable* whole tree failure.
8261	Red cedar	26.0”	20.0’	Yes	Sturdy tree with no signs of decay, disease, or structural defects. *Improbable* risk of failure.
8262	Red cedar	31.0”	22.0’	Yes	Sturdy tree with no signs of decay, disease, or structural defects. *Improbable* risk of failure.
8263	Red cedar	29.0” 38.0” [47.8”]	35.0’	Yes	Sturdy tree with no signs of decay, disease, or structural defects. *Improbable* risk of failure.
8264	Red cedar	15.0”	11.0’	Yes	Sturdy tree with no signs of decay or disease. Crooked trunk about 30’ up. *Possible* large part failure.
8265	Red cedar	30.0”	22.0’	Yes	Sturdy tree with no signs of decay, disease, or structural defects. *Improbable* risk of failure.
8266	Big-leaf maple	19.0”	14.0’	Yes	Sturdy tree with no signs of decay or disease. Leans to the north. *Possible* whole tree failure.
8267	Big-leaf maple	21.0”	15.0’	Yes	Sturdy tree with no signs of disease or decay. Deep crotch development suggests *possible* large part failures.

Tag #	Species	DSH	LOD	Viable	Condition
8268	Big-leaf maple	27.0”	20.0’	No	Seem and cavity about 12’ up the tree. *Possible* large part failures.
8269	Big-leaf maple	22.0”	16.0’	No	Large open decay pocket at the base of the trunk. *Probable* whole tree failure.
8270	Red cedar	17.0”	13.0’	Yes	Sturdy tree with no signs of decay, disease, or structural defects. *Improbable* risk of failure.
8271	Red alder	25.0”	15.0’	No	Large dead part of the trunk. *Probable* whole tree failure.
8272	Big-leaf maple	17.5” 18.0” 20.5” 21.0” [38.6”]	28.0’	Yes	Sturdy tree with no signs of disease or decay. Deep crotch development suggests *possible* large part failures.
8060	Red Alder	14.0”	10.0’	Yes	Sturdy tree with no signs of decay, disease, or structural defects. *Improbable* risk of failure.
8147	Apple *Malus sp*.	14.5”	10.0’	Yes	Sturdy tree with no signs of disease, decay, or structural defects. *Improbable* risk of failures.
8179	Big-leaf maple	26.5”	20.0’	Yes	Sturdy tree with no signs of decay or disease. Asymmetric canopy. Possible large part failures.
8180	Douglas fir	23.0”	17.0’	No	Sturdy tree with no signs of decay or disease. Crooked trunk about 30’ up. Susceptible to windthrow. *Possible* large part failure.
8182	Douglas fir	19.5”	15.0’	Yes	Sturdy tree with no signs of decay, disease, or structural defects. *Improbable* risk of failure.
8183	Douglas fir	14.0”	10.0’	Yes	Sturdy tree with no signs of decay, disease, or structural defects. *Improbable* risk of failure.
8184	Red cedar	19.0”	15.0’	Yes	Sturdy tree with no signs of decay, disease, or structural defects. *Improbable* risk of failure.

The Tibbetts Crossing area consists of three different ecological niches; forest, stream, and pasture. The forested area east of the stream has approximately 1,283 viable diameter inches (dia. in.) at standard height per acre. This was calculated by adding all the viable trees within 33,000 square feet (975 dia. in. / .76 acres) in Lots 17 and 18. There is approximately 6.7 acres of forested land east of the stream, which does not include critical areas and wetland buffers. This equals approximately 8,596 viable dia. in. for the 6.7 acres of forested area.

Developing Lots 17 – 20 will disturb 68,393 square feet (1.57 acres) of land. This removes about 2,014 dia. in. of viable trees and retains approximately 76.6% of the tree diameters for the forested area east of Tibbetts Creek [(8,596 – 2,014) / 8,596] x 100% = 76.6%.

The pasture land between SR-900 and the western wetland buffer, from the south corner of Lot 8 to the north border is approximately 210,000 square feet (4.8 acres). There is 81.5 dia. in. of viable trees within this pasture area. This equals about 17.0 dia. in. per acre.

The total area for pasture and forest, not including critical areas and wetland buffers, is about 11.5 acres. This is equivalent to 754.6 viable dia. in. per acre [(81.5dia. in. + 8596dia. in.) / 11.5acre = 754.6dia. in. / acre]. Removal of 5.13 acres of trees leaves a 44.6% tree retention plan for the whole site. 11.5 acres – (4.8 acres + 1.57 acres) = 5.13 acres. [(754.6 dia. in./acre x 5.13 acres) / 8677.5 dia. in.] x 100% = 44.6%.

New planting are required by the City of Issaquah to be at least 50% conifer. Conifer trees (evergreen trees bearing cones) must stand at least 7-8 feet tall when planted to equal 1 dia. in. Planting of new deciduous trees must have at least a 2 inch trunk caliper to equal 1 dia. in. Caliper is the diameter of the new tree's trunk 4-12 inches from top of root ball.

Protective fencing is encouraged around the perimeters of the LOD for each retained tree, or grove of trees during grading and construction. Chain-link fencing is recommended for tree protection to preserve the trees from soil disturbance due to machines, foot traffic, and materials. Grading and construction should not be allowed within the LOD of retained trees without prior consent from a Certified Arborist.

Additional tree credits may be obtained by planting native species such as some of the trees listed in the data table. Smaller, more ornamental species of native trees may include Excelsior cedar (*Thuja plicata* 'Excelsior'), Port Orford cedar (*Chamaecyparis lawsoniana*), and Mountain hemlock (*Tsuga mertensiana*) for evergreen conifer types. Additional deciduous native species appropriate for the site include Serviceberry tree (*Amelanchier alnifolia*), Dogwood (*Cornus nutellii* or *Cornus* 'Eddie's White Wonder'), Cascara buckthorn (*Rhamnus purshiana*), Oregon Ash (*Fraxinus latifolia*), and Vine maple (*Acer circinatum*).

Please reply if you have questions.

Thank you,

Lonnie Olson

Lonnie Olson, Owner
ISA Certified Arborist (PN-5427A)
Qualified Tree Risk Assessor (#697)

Glossary:

Drip line – the edge of the critical root zone that circumferences around a tree from trunk to average branch tips.
Windthrow – The susceptibility of a tree to fall under high wind conditions.

MEMORANDUM

DATE: September 5, 2018

TO: Leo Suver, President
Steve Burnstead Construction, LLC

FROM: Michael Read, PE, Principal, TENW

SUBJECT: Tibbitts Creek Cluster Subdivision, Issaquah, WA
Limited Scope Traffic Analysis
TENW Project No. 3379

This memorandum summarizes the results of limited-scope traffic analysis associated with a proposed 20-lot residential subdivision on an approximate 22-acre parcel along the Renton-Issaquah Road (SR 900) in Issaquah, WA. As the proposed project would generate less than 30 weekday p.m. peak hour vehicle trips, the traffic impact study was limited to review of:

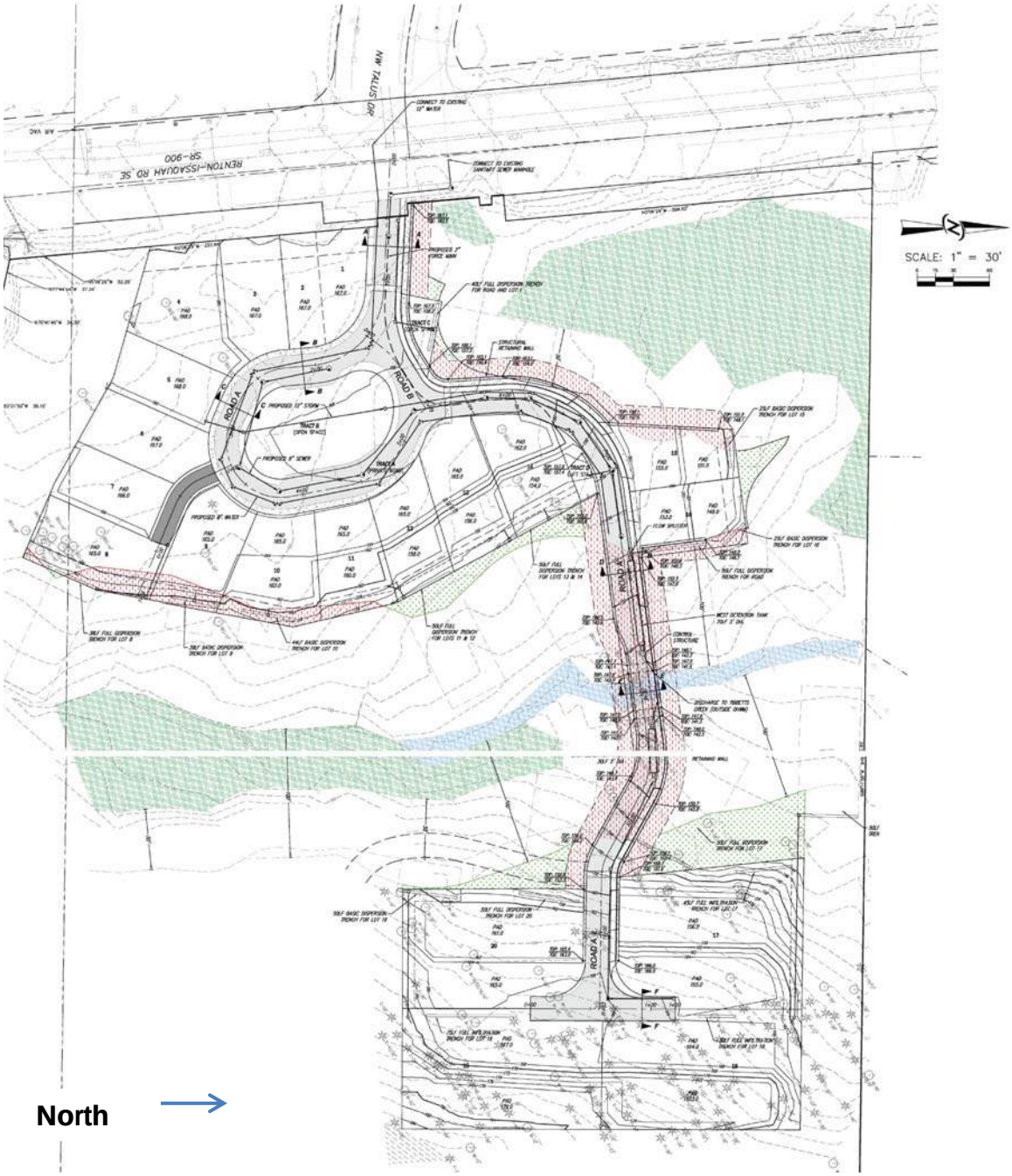
- Project trip generation;
- Intersection sight distance (for right-turn-on-red) exiting movements from the site access driveway; and
- Review right-turn lane warrant per WSDOT Design Manual for vehicles entering the site from SR 900.

Project Description

The existing site is a single family residential property with a home and several outbuildings. It is accessed via a driveway onto the Renton-Issaquah Road (SR 900) as the east leg of its signalized intersection with NW Talus Drive. The proposed action would remove the existing home and construct 20 new single family dwelling units in a clustered subdivision to avoid creek and wetland impacts on the site. When completed, a net increase of 19 new single-family homes would be created within the property.

An overall project site plan is provided as Figure 1.

Figure 1
Tibbitts Creek Clustered Subdivision
Project Site Plan



Project Trip Generation

Using ITE rates published in *Trip Generation Manual, 10th Edition*, 2017, for the 19 new Single Family Homes (ITE Land Use Code 210), Table 1 summarizes the net trip generation under the proposed development. As shown, an estimated net increase of approximately 179 daily, 14 a.m. peak hour (4 entering and 10 exiting), and 19 p.m. peak hour vehicular trips (12 entering and 7 exiting) would be generated at full build-out of the residential subdivision. A detailed summary of trip generation calculations is provided in Attachment A.

Table 1
Tibbitts Creek Trip Generation Summary

Time Period	*In*	*Out*	*Total*
Weekday AM Peak Hour	4	10	14
Weekday PM Peak Hour	12	7	19
Weekday Daily	90	89	179

Source: Trip Generation Manual, 10th Edition, ITE, 2017.

Traffic Counts and Volumes

Peak hour traffic volumes represent the highest hourly volume of vehicles passing through an intersection during a typical 4-6 p.m. weekday peak period. Peak period turning movement counts at study intersections were conducted at SR 900/Talus Drive in July 2015 by IDax (see Attachment B). Permanent traffic recorders installed by WSDOT in the Issaquah vicinity were reviewed for seasonality information. All indicated higher than typical average counts during July months, with factors of 0.90 for PTR Station S203 for July month in 2014 (see also Attachment B). As such, no reductions in current traffic volumes were made to account for seasonality.

Given the expected buildout year of 2020, existing volumes were factored by 2 percent per year per City of Issaquah TIS Guidelines for use in determining turn lane warrants and are provided in Attachment B.

Intersection Sight Distance

Per the City of Issaquah 2010 Street Standards, Design, C. Intersection and Driveway Sight Distance Triangles, Section 1., entering sight distance with a minimum of 430 feet is necessary to meet a design speed of 45 mph (5 mph above the posted speed limit) for safe right-turn on red movements exiting the proposed Silverado Memory Care westbound approach at the SR 900/Talus Drive intersection. Entering sight distance from the approximate location of the outside egress lane of the driveway was field estimated by TENW at approximately 600 feet, exceeding minimum standards. As such, adequate entering sight distance would be provided. Attachment C provides a confirmation of this minimum sight distance using a scaled aerial photo.

WSDOT Right-Turn Only Lane Review

Left- and right-turn movements represent critical turning movements at intersections, increasing the potential for intersection delay and safety issues. Although a multilane arterial and signalized, the City requested a review of WSDOT guidelines for a separate right-turn only lane into the project site from SR 900 at buildout of the project. Based on likely trip distribution, approximately 25 percent of all trips are expected to/from the south via SR 900. Based upon procedures and guidelines found in WSDOT's Design Manual, July 2014 (Figure 910-11 Right-Turn Lane Guidelines), a northbound right-turn lane is not warranted (installation of a radius only) based upon 4 northbound right-turns and a northbound peak hour approach volume of approximately 595 vehicles with the proposed development in 2020. Attachment D provides a summary of this right-turn lane guideline review.

Conclusions

The proposed *Tibbetts Creek Clustered Subdivision* was evaluated for traffic impacts, include trip generation, sight distance, and turn lane warrants. As the vehicle trip generation analysis of the proposed project would be far below the City's minimum threshold for a traffic impact study, a limited scope was completed and no further traffic analysis is warranted or required.

To mitigate impacts of the proposed project to planned systemwide transportation improvements, the City collects transportation impact fees for traffic and bicycle/pedestrian improvements. Based on impact fee rates effective February 2018, impact fees are estimated as follows:

19 Single-Family Homes: ($8,622.27 +$834 per Single-Family Home) or $179,669.13

If you have any questions regarding the information presented in this memo, please call me at (206) 361-7333 x 101 or mikeread@tenw.com.

Attachment A

Project Trip Generation Estimates

ITE Trip Generation, 10th Edition
Tibbitts Creek Clustered Subdivision - Issaquah, WA

		LU	AM Peak			PM Peak			Daily			
Proposed	**X**	**Code**	**Enter**	**Exit**	**Trips**	**Enter**	**Exit**	**Trips**	**Trips**	**Daily Rate**	**AM Rate**	**PM Rate**
Single-Family Detached Housing	19	210	4	10	14	12	7	19	179	9.44	0.74	0.99
Net Project Trip Generation			**4**	**10**	**14**	**12**	**7**	**19**	**179**			

Attachment B

Existing Traffic Counts at SR 900/Talus Drive

&

WSDOT Seasonality Information in Issaquah Vicinity

&

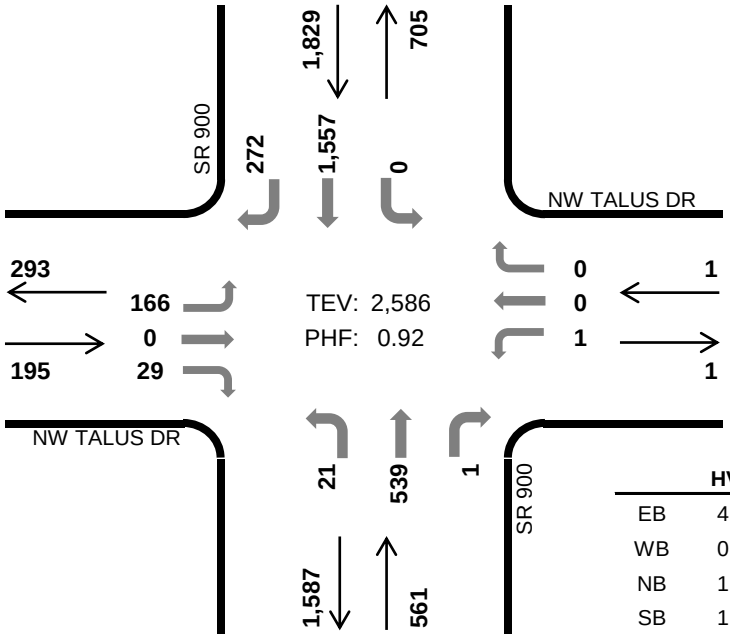
2020 Direction Flow Volumes

SR 900
NW TALUS DR

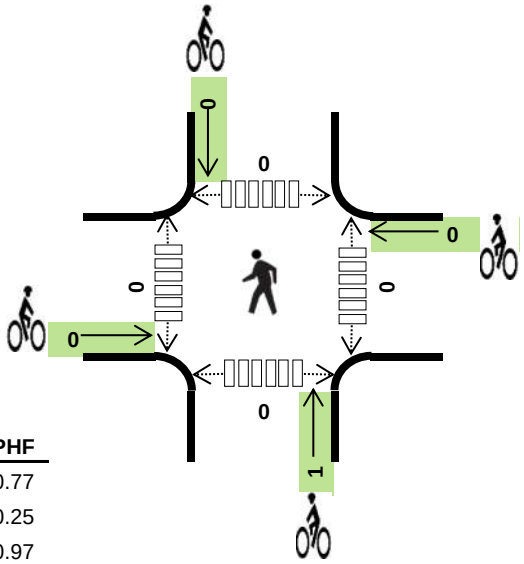
Date: Tue, Jul 28, 2015
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:00 PM to 5:00 PM

N

Peak Hour



	HV %:	PHF
EB	4.1%	0.77
WB	0.0%	0.25
NB	1.1%	0.97
SB	1.3%	0.90
TOTAL	1.5%	0.92



Two-Hour Count Summaries

Interval Start	NW TALUS DR Eastbound			NW TALUS DR Westbound			SR 900 Northbound			SR 900 Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	**54**	**0**	**9**	**0**	**0**	**0**	**5**	**140**	**0**	**0**	**383**	**51**	**642**	
4:15 PM	**46**	**0**	**8**	**0**	**0**	**0**	**6**	**136**	**0**	**0**	**432**	**74**	**702**	
4:30 PM	**43**	**0**	**6**	**0**	**0**	**0**	**4**	**136**	**0**	**0**	**335**	**54**	**578**	
4:45 PM	**23**	**0**	**6**	**1**	**0**	**0**	**6**	**127**	**1**	**0**	**407**	**93**	**664**	**2,586**
5:00 PM	33	0	4	0	0	0	3	132	0	0	336	85	593	2,537
5:15 PM	64	0	5	0	0	0	10	130	0	0	264	64	537	2,372
5:30 PM	44	0	4	0	0	0	6	112	0	0	333	100	599	2,393
5:45 PM	62	0	4	0	0	0	6	101	0	0	287	83	543	2,272
Count Total	369	0	46	1	0	0	46	1,014	1	0	2,777	604	4,858	
Peak Hr	**166**	**0**	**29**	**1**	**0**	**0**	**21**	**539**	**1**	**0**	**1,557**	**272**	**2,586**	

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	**2**	**0**	**2**	**10**	***14***	**0**	**0**	**1**	**0**	***1***	**0**	**0**	**0**	**0**	***0***
4:15 PM	**5**	**0**	**4**	**6**	***15***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
4:30 PM	**0**	**0**	**0**	**4**	***4***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
4:45 PM	**1**	**0**	**0**	**4**	***5***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:00 PM	1	0	1	5	*7*	0	0	0	0	*0*	0	0	0	0	*0*
5:15 PM	0	0	1	3	*4*	0	0	0	0	*0*	0	1	0	0	*1*
5:30 PM	2	0	2	3	*7*	0	0	0	0	*0*	0	0	0	0	*0*
5:45 PM	0	0	0	1	*1*	0	1	0	0	*1*	0	4	0	0	*4*
Count Total	11	0	10	36	*57*	0	1	1	0	*2*	0	5	0	0	*5*
Peak Hr	**8**	**0**	**6**	**24**	***38***	**0**	**0**	**1**	**0**	***1***	**0**	**0**	**0**	**0**	***0***

Mark Skaggs: 425 - 250 - 0777 mark.skaggs@idaxdata.com

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION
T R I P S S Y S T E M
PERMANENT TRAFFIC RECORDERS*
CONVERSION FACTORS: AVERAGE WEEKDAY TRAFFIC (AWDT) TO ANNUAL AVERAGE DAILY TRAFFIC (AADT)
URBAN STATIONS

MONTH	AWDT	FACTOR	AWDT	FACTOR	AWDT	FACTOR	AWDT	FACTOR	AWDT	FACTOR	AWDT	FACTOR	AWDT	FACTOR
	R49R		S103		S203		S206		S502		S503		S547	
JANUARY	53723	.87	52320	1.04	148660	1.01	35295	.94	54003	.91	21450	1.06	87272	.91
FEBRUARY	53857	.87	55293	.98	152201	.98	35071	.95	54825	.90	22634	1.00	87078	.92
MARCH	54519	.86	57854	.94	155370	.96	36356	.92	54221	.91	22605	1.01	89078	.89
APRIL	54390	.86	59427	.92	158859	.94	35895	.93	54860	.90	23950	.95	89186	.89
MAY	55474	.84	61412	.89	162812	.92	38023	.88	55763	.88	24076	.94	92298	.86
JUNE	56049	.84	60919	.89	165773	.90	38193	.87	57957	.85	24439	.93	93287	.85
JULY	55066	.85	59901	.91	166972	.90	37429	.89	58065	.85	25685	.89	90678	.88
AUGUST	55318	.85	58892	.92	164092	.91	37709	.88	57231	.86	26060	.87	90438	.88
SEPTEMBER	54534	.86	60064	.91	162778	.92	37545	.89	56322	.87	24535	.93	92499	.86
OCTOBER	53483	.88	59294	.92	159049	.94	37326	.89	56189	.88	22750	1.00	93050	.86
NOVEMBER	51412	.91	56404	.96	153523	.97	35338	.94	53882	.91	22308	1.02	89396	.89
DECEMBER	51913	.90	55239	.98	152200	.98	34764	.96	54521	.90	20739	1.10	87401	.91
AADT	46815		54389		149538		33324		49252		22738		79703	

	S809		S822		S824		S825		S827		S837		S839	
JANUARY	198953	1.04	190832	1.05	120800	1.02	126896	1.02	146455	1.06	187064	1.04	50953	.86
FEBRUARY	207505	.99	197011	1.01	125293	.98	130640	1.00	153677	1.01	195096	1.00	51574	.85
MARCH	211267	.98	200056	1.00	128319	.96	135134	.96	155556	1.00	198284	.98	52519	.83
APRIL	215655	.96	207756	.96	131101	.94	137787	.94	159349	.97	203010	.96	52690	.83
MAY	218167	.94	220908	.90	131802	.93	141173	.92	160104	.97	203112	.96	53170	.82
JUNE	224943	.92	225377	.89	134882	.91	144550	.90	164841	.94	208920	.93	54628	.80
JULY	224310	.92	225501	.89	135406	.91	145400	.89	165245	.94	210025	.93	53662	.82
AUGUST	224145	.92	225720	.88	134970	.91	143387	.91	163512	.95	210522	.93	53826	.81
SEPTEMBER	216955	.95	221714	.90	130306	.94	139777	.93	156601	.99	202867	.96	53358	.82
OCTOBER	208102	.99	216395	.92	126278	.97	134570	.97	151977	1.02	196731	.99	52866	.83
NOVEMBER	207812	.99	211855	.94	124532	.99	129931	1.00	151318	1.02	194838	1.00	50110	.87
DECEMBER	212763	.97	213716	.93	126197	.97	131478	.99	154535	1.00	197516	.99	49803	.88
AADT	206135		199619		122736		129988		155082		195144		43780	

* OREGON-OWNED RECORDERS AND FERRY TERMINALS EXCLUDED

Tibbitts Creek Cluster Subdivision - Issaquah, WA
2020 PM Peak Hour Turning Movement Estimates

Growth Rate =	2.0%
Existing Year =	2015
Future Year =	2020

Enter	Exit	
12	7	19

2015 Existing

1 SR 900/Talus Drive

		1,829	705			
		272	1,557	0		
293	166				0	1
	0		2,586		0	
195	29				1	1
		21	539	1		
			561			

2020 Baseline

1 SR 900/Talus Drive

		2,019	778			
		300	1,719	0		
323	183				0	1
	0		2,855		0	
215	32				1	1
		23	595	1		
		1,752	619			

% Increase = 10.4%

Trip Distribution

1 SR 900/Talus Drive

		70%	70%			
				70%		
5%					70%	100%
	5%		200%		5%	
5%					25%	100%
				25%		
		25%	25%			

Project Trips

1 SR 900/Talus Drive

		8	5			
				8		
0					5	7
	1		19		0	
1					2	12
				3		
		2	3			

2020 With-Project

1 SR 900/Talus Drive

		2,027	783			
		300	1,719	8		
324	183				5	8
	1		2,874		0	
216	32				3	13
		23	595	4		
		1,754	622			

Project Share = 0.6%

Tibbitts Creek Cluster Subdivision - Issaquah, WA
2020 PM Peak Hour Turning Movement Estimates

Growth Rate =	2.0%
Existing Year =	2015
Future Year =	2020

Enter	Exit	
12	7	19

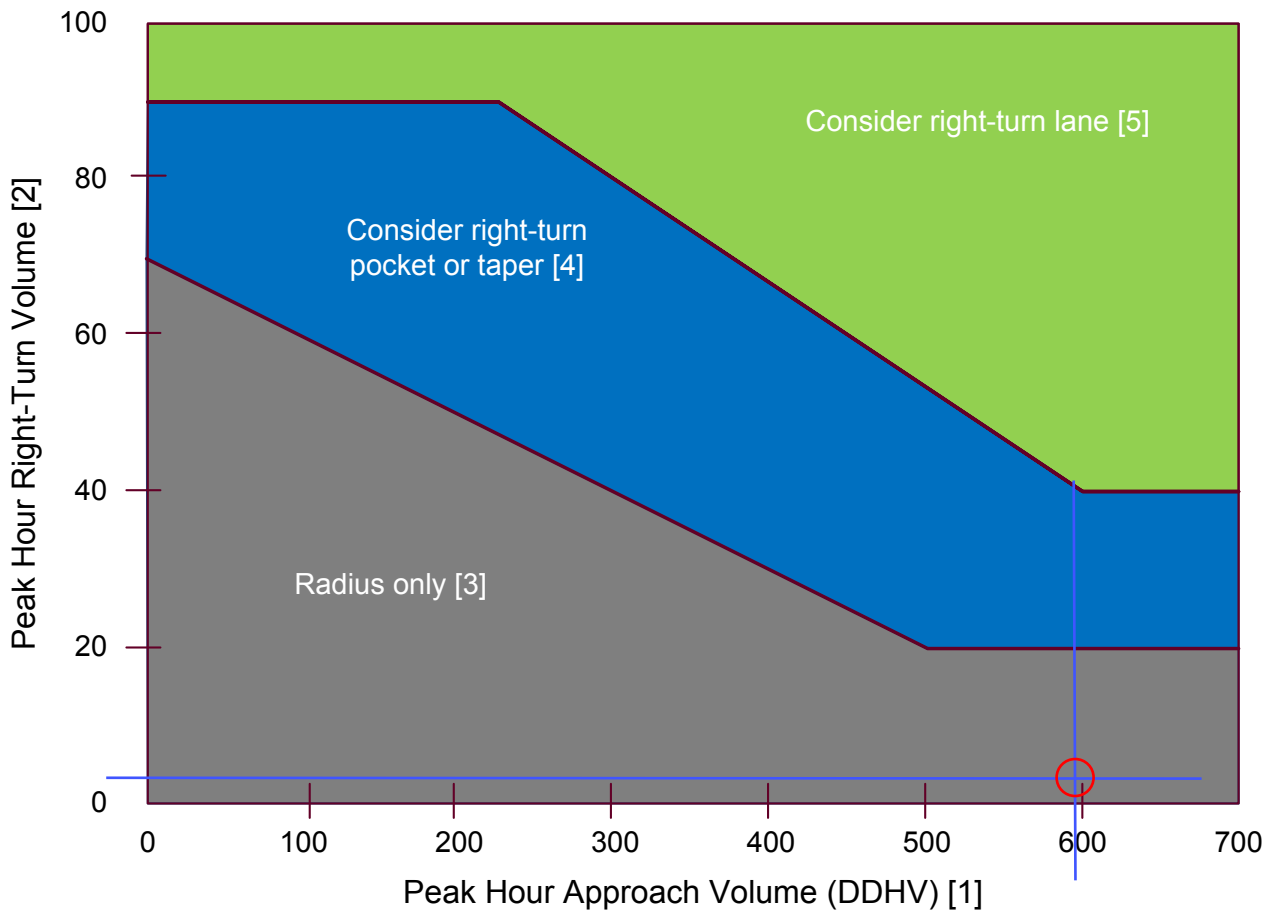
2015 Existing	2020 Baseline	Trip Distribution	Project Trips	2020 With-Project

Attachment C
Entering Sight Distance Exhibit

0
200 ft
400 ft
608.47 ft
Measure distance
Total distance: 608.47 ft (185.46 m)
Click on the map to add to your path

Attachment D

WSDOT Right Turn Only Lane Guideline Review



Notes:

[1] For two-lane highways, use the peak hour DDHV (through + right-turn).
For multilane, high-speed highways (posted speed 45 mph or above), use the right-lane peak hour approach volume (through + right-turn).

[2] When all three of the following conditions are met, reduce the right-turn DDHV by 20:

- The posted speed is 45 mph or below
- The right-turn volume is greater than 40 VPH
- The peak hour approach volume (DDHV) is less than 300 VPH

[3] For right-turn corner design, see Exhibit 1310-6.

[4] For right-turn pocket or taper design, see Exhibit 1310-12.

[5] For right-turn lane design, see Exhibit 1310-13.

Right-Turn Lane Guidelines
Exhibit 1310-11

Development Services Department
1775 – 12th Ave. NW | P.O. Box 1307
Issaquah, WA 98027
425-837-3100 | *DSD@issaquahwa.gov*

Transportation Concurrency Certificate

This Certificate is issued pursuant to Issaquah Municipal Code 18.15.280 certifying that at the time of issuance this development complied with the requirements of Transportation Concurrency Management, IMC 18.15.

Concurrency No: CON19-00006
Project Name: TIBBETTS CROSSING
Site Address / Location:
Parcel(s):

Applicant: LEO SUVER
11980 NE 24TH ST.
BELLEVUE, WA 98005

Owner: LEO SUVER
11980 NE 24TH ST.
BELLEVUE, WA 98005

Issuance Date: 05/01/19
Specified Uses: Single-Family Houses
Net New Vehicle Internal Trip Ends: 20

Validity: This certificate is valid only for the specified uses, densities, intensity and parcel(s) for which it was issued and shall not be transferred to a different project or parcel. Validity is pursuant City of Issaquah Municipal Code 18.15.280 (B).

Expiration: This certificate shall expire if 1. A complete development permit application for the project has not been submitted to the Permit Center within one (1) year from the issuance of the concurrency certificate; three (3) years from issuance for a project that includes transferred development rights. 2. The related development permit application is denied or revoked by the City. 3. The related development permit expires prior to issuance of a building permit. Expiration is pursuant City of Issaquah Municipal Code 18.15.280 (C).

AFFIDAVIT OF SERVICE OF MAILING

State of Washington)
County of King)
City of Issaquah)

CARLA ZABRISKIE, being first duly sworn, upon oath, deposes and states:

That on the 22ND day of OCTOBER, 2018, I deposited in the mail of the United States a sealed envelope containing a public hearing notice, decision or recommendation with postage prepaid addressed to the adjacent property and/or parties of record in the below entitled application or petition.

NOTICE OF NEIGHBORHOOD MEETING, VINCINITY MAP, PRELIMINARY PLAT MAP – MONDAY, NOV. 5, 2018
PP18-00002

Carla Zabriskie
Signed by

SUBSCRIBED AND SWORN to before me this 22nd day of October, 2018

JENNIFER A. WOODS
COMMISSION EXPIRES
NOTARY PUBLIC
11-08-2020
STATE OF WASHINGTON

Jennifer A. Woods
Notary Public in and for the State of Washington
residing at Bothell, WA, therein.

Notice of Neighborhood Meeting

CITY OF ISSAQUAH WASHINGTON
Development Services Department
1775 12th Ave. NW, P.O. Box 1307
Issaquah, WA 98027
425-837-3100 *DSD@issaquahwa.gov*

PROJECT NAME: Tibbetts Crossing – Subdivision
LOCATION: 7932 Renton-Issaquah Rd SE, Issaquah, WA 98029
FILE NO: PP18-00002

APPLICANT: Leo Suver
Steve Burnstead Construction, LLC
11980 NE 24th St, Ste 200
Bellevue, WA 98005

NEIGHBORHOOD MEETING INFORMATION
DATE: Monday, November 5, 2018
LOCATION: City Hall Northwest
TIME: 5:00 p.m.
MEETING ROOM: Pickering Room (2nd Floor)

NEIGHBORHOOD MEETING

The purpose of a neighborhood meeting is to allow the community to participate early in the permit process and to raise potential issues and concerns regarding a proposed subdivision. The project applicant will provide information regarding their proposed Preliminary Plat subdivision. The applicant will be available to answer questions and concerns about the project. City staff will also be in attendance.

PROJECT INFORMATION

Project Description: A preliminary plat for the subdivision of approximately 21.94 acres, into 20 single-family residential lots. Primary access to the site is proposed from Renton-Issaquah RD SE (SR 900). Infrastructure improvements will include roads, water, sewer and frontage improvements along SR 900. **(See attached plans)**

Project Location: 7932 Renton-Issaquah Rd SE **(See map)**

Required Permits: SEPA, Preliminary Plat, Final Plat, Site Work, Building, Right-of-Way

Required Studies: Wetland, Traffic, Geotechnical, Arborist

REGULATORY INFORMATION

Zoning: Single Family – Estate (SF-E)

Comprehensive Plan Designation: Low Density Residential

Consistent With Comprehensive Plan: Yes

Preliminary Determination of the Development Regulations that will be used for Project Mitigation and Consistency:
Issaquah Municipal Code (IMC), Comprehensive Plan
(Online at: issaquahwa.gov/codes and plans)

MORE INFORMATION

The application is available for review at the Permit Center, City Hall Northwest, 1775 12th Avenue NW (next to Holiday Inn and behind Lowe's), 9am – 5pm. An appointment with the Project Planner is suggested.

The official public comment period will not commence until a preliminary plat application is filed with the City, though you may submit comments in advance of any permit applications.

Neighbors within 300 feet of the subject property and Parties of Record will receive separate notification of the application for preliminary plat.

Written comments may be submitted to:

Development Services Department
P.O. Box 1307, Issaquah, WA 98027

Or by e-mail to the Project Planner noted below.

To receive further public notices on this project please provide your name, address, and e-mail to the Project Planner and request to become a Party of Record.

Notice is required to be provided to property owners within 300 feet of the site and to Parties of Record. Please share this notice with others in your neighborhood who may be interested in this project. Property owner, Mortgagee, Lien Holder, Vendor, Seller, etc., please share this notice with tenants and others who may be interested in this project.

CITY CONTACT INFORMATION

Project Planner: Valerie Porter
Phone Number: 425-837-3094
E-Mail: valeriep@Issaquahwa.gov

Development Services Department:
Phone Number: 425-837-3100
E-Mail: DSD@issaquahwa.gov

Vicinity Map - Parcel No.: 2924069041

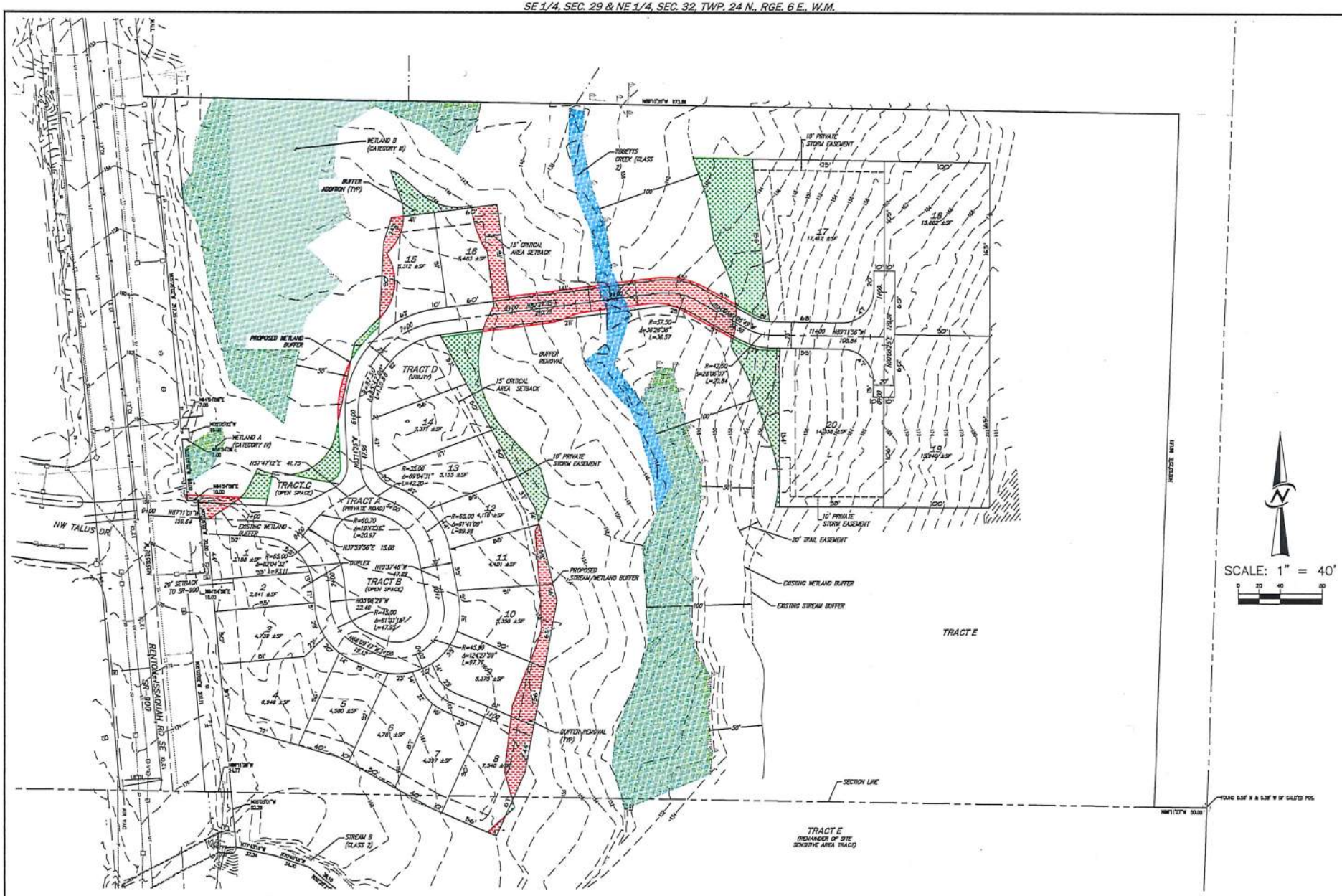
2,088.4 0 1,044.18 2,088.4 Feet

1: 12,530

City of Issaquah GIS

DISCLAIMER: These maps and other data are for informetional purposes and have not been prepared for, nor are they suitable for legal, surveying, or engineering purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. The City of Issaqueh makes no warranty or guarantee as to the content, accuracy, timeliness, or completeness of any of the data provided, and assumes no legal responsibility for the informetion contained hereon.

SE 1/4, SEC. 29 & NE 1/4, SEC. 32, TWP. 24 N., RGE. 6 E., W.M.



CORE DESIGN
14711 NE 29th Place Suite 101
Bellevue, Washington 98007
425.885.7877 Fax 425.885.7963
ENGINEERING · PLANNING · SURVEYING

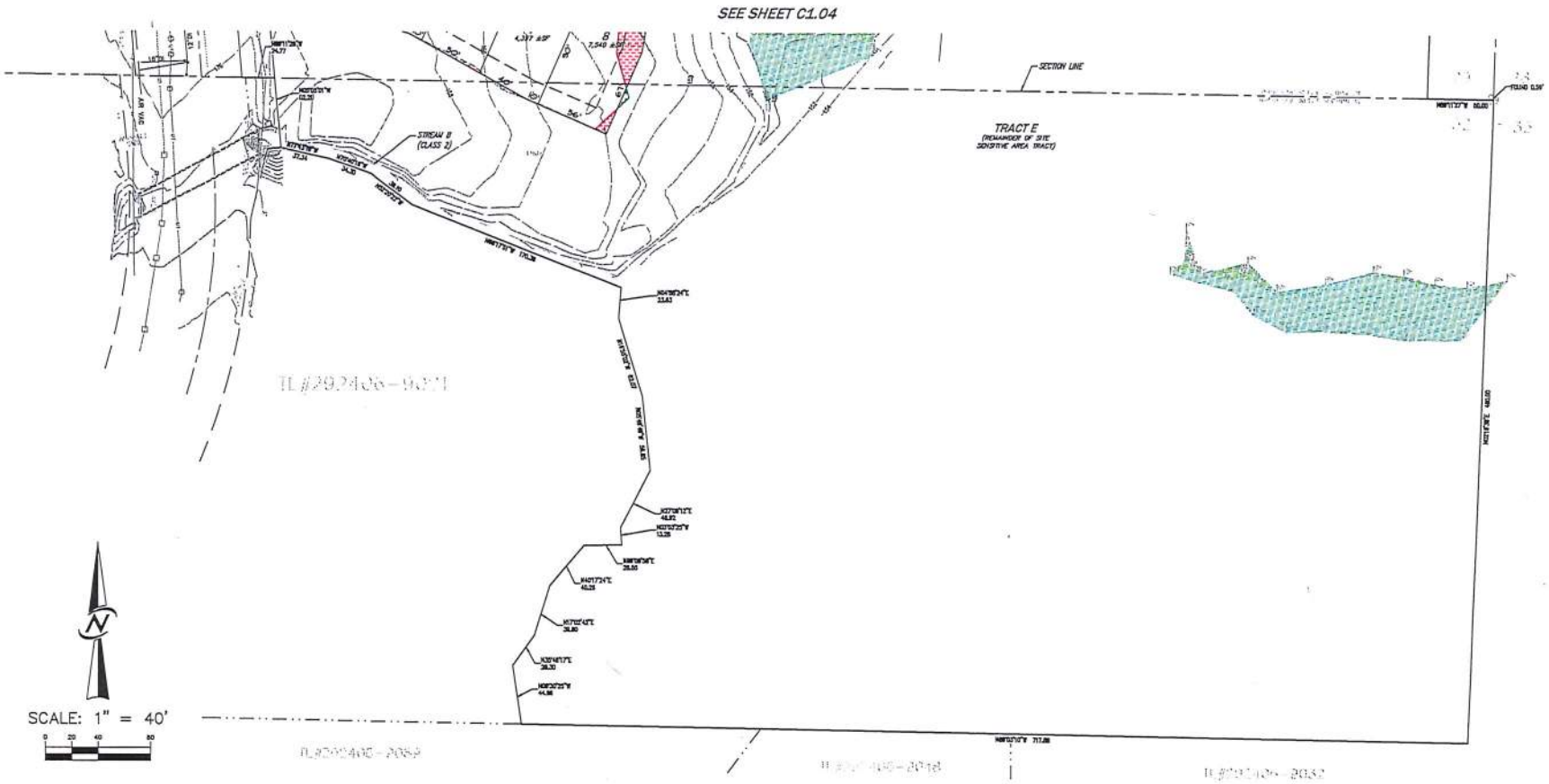
PRELIMINARY PLAT MAP
TIBBETTS CROSSING
STEVE BURNSTEAD CONSTRUCTION, LLC
11900 NE 24th STREET SUITE 200
BELLEVUE, WA 98005

DATE	AUGUST 2018
DESIGNED	SHERI H. MURATA, P.E.
DRAWN	DAVID S. VAUGHN
APPROVED	SHERI H. MURATA, P.E.
	PROJECT MANAGER

SHEET C1.04 OF 14

PROJECT NUMBER 17127

SE 1/4, SEC. 29 & NE 1/4, SEC. 32, TWP. 24 N., RGE. 6 E., W.M.



HORIZONTAL DATUM

NAD 83-2011 WASHINGTON COORDINATE SYSTEM NORTH ZONE BASED ON GPS MEASUREMENTS CONSTRAINED TO THE WASHINGTON REFERENCE NETWORK.

VERTICAL DATUM

NAVD88 CONSTRAINED TO CITY OF BELLEVUE BENCHMARK V-429 AT THE EASTSIDE OF SR900 & TALUS DRIVE.

NOTES

SITE AREA: TL#2924069041 7932 RENTON-ISSAQUAH RD SE

ALL DISTANCES SHOWN ARE GROUND DISTANCES UNLESS OTHERWISE NOTED.

THE LOCATION AND DESCRIPTION OF ALL SURVEY MARKERS SHOWN HEREON ARE BASED ON FIELD OBSERVATIONS TAKEN ON DECEMBER 2, 2003, UNLESS OTHERWISE INDICATED.

WORK PERFORMED IN CONJUNCTION WITH THIS SURVEY UTILIZED THE FOLLOWING EQUIPMENT AND PROCEDURES: (A) 1" TRIMBLE 5S SERIES ELECTRONIC TOTAL STATION, MAINTAINED TO THE MANUFACTURER'S SPECIFICATIONS PER W.A.C. 332-130-100. (B) FIELD TRAVERSE, EXCEEDING REQUIREMENTS SET FORTH IN W.A.C. 332-130-090.

THIS SURVEY WAS PERFORMED WITHOUT THE BENEFIT OF A TITLE REPORT AND DOES NOT PURPORT TO SHOW ALL EASEMENTS.

THIS TOPOGRAPHIC SURVEY DRAWING ACCURATELY PRESENTS SURFACE FEATURES LOCATED DURING THE COURSE OF THIS SURVEY. UNDERGROUND UTILITIES SHOWN HEREON ARE BASED SOLELY UPON INFORMATION PROVIDED BY OTHERS AND PACE ENGINEERS, INC. DOES NOT ACCEPT RESPONSIBILITY OR ASSUME LIABILITY FOR THEIR ACCURACY OR COMPLETENESS. CONTRACTOR/ENGINEERS SHALL VERIFY EXACT SIZE AND LOCATION PRIOR TO CONSTRUCTION.
CALL FOR LOCATE: UTILITY LOCATION SERVICE: 811

FEMA FLOOD PLAN DELINEATED FROM FIRM MAP# 53033C0693G AND 53033C0691K

LEGAL DESCRIPTION

LEGAL DESCRIPTION: TAX LOT# 2924069-9041

LOT B OF ISSAQUAH LLA PLN 12-00027 RECORDED IN KING COUNTY RECORDS UNDER RECORDING NO. 20121213900009

REVISIONS		

CORE DESIGN
14711 NE 29th Place Suite 101
Bellevue, Washington 98007
425.885.7877 Fax 425.885.7963
ENGINEERING · PLANNING · SURVEYING

PRELIMINARY PLAT MAP
TIBBETTS CROSSING

STEVE BURNSTEAD CONSTRUCTION, LLC
11980 NE 24th STREET, SUITE 200
BELLEVUE, WA 98005

DATE	AUGUST 2018	
DESIGNED	SHERI H. MIRAITA, P.E.	
DRAWN	DAVID S. VILUSKIN	
APPROVED	SHERI H. MIRAITA, P.E.	PROJECT MANAGER

SHEET C1.05 OF 14

PROJECT NUMBER 17127

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MEYER WILLIAM
P O BOX 58
ISSAQUAH, WA 98027

ISSAQUAH CITY OF
PO BOX 1307
ISSAQUAH, WA 98027

TRAN TAI V
PO BOX 27799
SETATLE, WA 98165

PUGET SOUND ENERGY/ELEC
PO BOX 97034
BELLEVUE, WA 98009

AFFIDAVIT OF SERVICE OF MAILING

State of Washington)
County of King)
City of Issaquah)

CARLA ZABRISKIE, being first duly sworn, upon oath, deposes and states:

That on the 19th day of NOVEMBER, 2018, I deposited in the mail of the United States a sealed envelope containing a public hearing notice, decision or recommendation with postage prepaid addressed to the adjacent property and/or parties of record in the below entitled application or petition.

PP1800002 NOTICE OF APPLICATION - TIBBETTS CROSSING SUBDIVISION VINCINITY MAP, PRELIMINARY PLAT MAP.

Carla Zabriskie
Signed by

SUBSCRIBED AND SWORN to before me this 19th day of November, 2018

JENNIFER A. WOODS
COMMISSION EXPIRES
NOTARY
PUBLIC
11-08-2020
STATE OF WASHINGTON

Jennifer A. Woods
Notary Public in and for the State of Washington
residing at Bothell, WA, therein.

Notice of Application

CITY OF ISSAQUAH WASHINGTON
Development Services Department
1775 12th Ave. NW, P.O. Box 1307
Issaquah, WA 98027
425-837-3100 *DSD@issaquahwa.gov*

Project Name: **Tibbetts Crossing - Subdivision**

Application: **September 24, 2018**
Application Complete: **November 6, 2018**
Notice of Application: **November 19, 2018**

Notice of Application Public Comment Period:

November 19, 2018 – December 3, 2018
(See Public Comment below for more information)

PROJECT INFORMATION

File Number(s): PP18-00002

Project Description: A preliminary plat for the subdivision of approximately 21.94 acres, into 20 single-family residential lots. Primary access to the site is proposed from Renton-Issaquah RD SE (SR 900). Infrastructure improvements will include roads, water, sewer and frontage improvements. (See Site Plan)

Project Location: 7932 Renton-Issaquah Rd SE
(See Vicinity Map)

Size of Subject Area in Acres: 21.94 **Sq. Ft.:** 955,706.4

Applicant: Leo Suver
Steve Burnstead Construction, LLC
11980 NE 24th St, Ste 200
Phone: 425-454-1900; Email: leo@burnstead.com

Decision Maker: Hearings Examiner

Required City Permits: SEPA, Preliminary Plat

Required City Permits, Not Part of this Application: Final Plat, Site Work, Building, Landscape, Right-of-Way

Required Studies: Wetland, Traffic, Geotechnical, Arborist

REGULATORY INFORMATION

Zoning: SF-E - Single Family Suburban Estates

Comprehensive Plan Designation: Low Density Residential

Consistent with Comprehensive Plan: Yes

Preliminary Determination of the Development Regulations that will be used for Project Mitigation and Consistency:
Issaquah Municipal Code (IMC), Comprehensive Plan

PUBLIC COMMENT

Key application documents are available at the City's website: issaquahwa.gov/development. Click on the parcel, then select "View Related Documents and Permits" to see the available submittals. The full application is available for review at the Permit Center, City Hall Northwest, 1775 12th Avenue NW (next to Holiday Inn and behind Lowe's), 9 am – 5 pm. Please make an appointment with the Project Planner.

Although comments may be accepted up until the final decision is issued, submittal of comments during the Notice of Application Comment Period will ensure comments are considered prior to issuing a decision and will allow staff and/or the applicant to address comments as early in the process as possible.

Written comments are due by 5:00 pm on the Public Comment Period date noted above to:

Development Services Department
P.O. Box 1307, Issaquah, WA 98027

Or by e-mail to the Project Planner noted below.

To receive further public notices on this project please provide your name, address, and e-mail to the Project Planner and request to become a Party of Record.

Notice, when required, is required to be provided to property owners within 300 feet of the site and to Parties of Record. Please share this notice with others in your neighborhood who may be interested in this project. Property owner, Mortgagee, Lien Holder, Vendor, Seller, etc., please share this notice with tenants and others who may be interested in this project.

PUBLIC MEETING AND PUBLIC HEARING:

The Hearings Examiner is the decision maker for the Preliminary Plat application. Date and time of the meeting and hearing has not been set. A follow up notice will be sent to property owners within 300 feet and to Parties of Record to notify them of the meetings.

CITY CONTACT INFORMATION

Project Planner: Valerie Porter, Associate Planner
Phone Number: 425-837-3094
E-Mail: ValerieP@issaquahwa.gov

Development Services Department:
Phone Number: 425-837-3100
E-Mail: DSD@issaquahwa.gov

Vicinity Map - Parcel No.: 2924069041

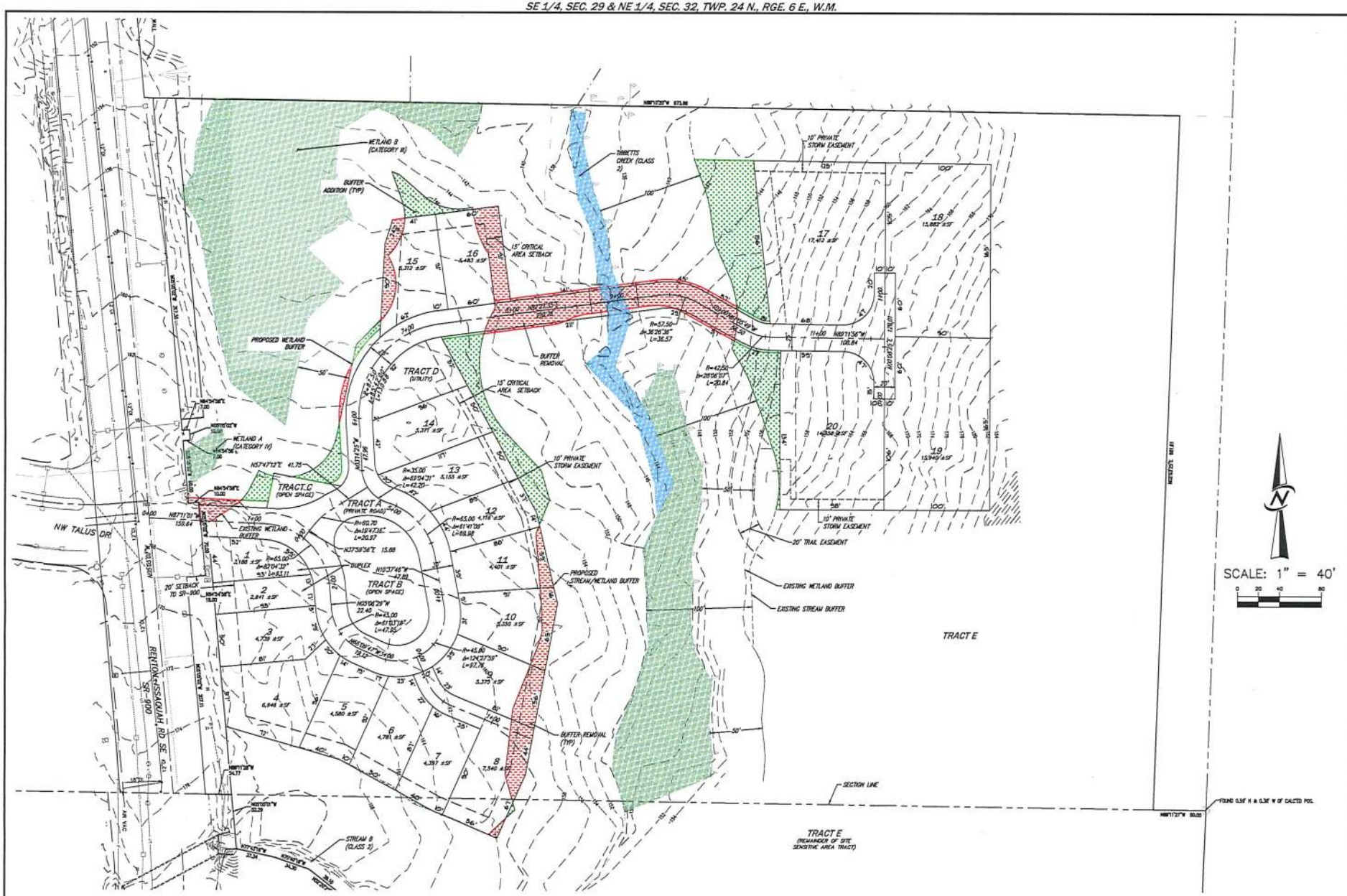
2,088.4 0 1,044.18 2,088.4 Feet

1: 12,530

City of Issaquah GIS

DISCLAIMER: These maps and other data are for informational purposes and have not been prepared for, nor are they suitable for legal, surveying, or engineering purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. The City of Issaquah makes no warranty or guarantee as to the content, accuracy, timeliness, or completeness of any of the data provided, and assumes no legal responsibility for the information contained hereon.

SE 1/4, SEC. 29 & NE 1/4, SEC. 32, TWP. 24 N., RGE. 6 E., W.M.



SEE SHEET C1.05

BUFFER AVERAGING
BUFFER ADDITION 14,387 SF
BUFFER REMOVAL 12,914 SF

CORE DESIGN
ENGINEERING · PLANNING · SURVEYING
12711 NE 20th Place Suite 101
Bellevue, Washington 98007
425.885.7877 fax 425.885.7963

PRELIMINARY PLAT MAP
TIBBETTS CROSSING

STEVE BURNSTEAD CONSTRUCTION, LLC
11980 NE 24th STREET SUITE 200
BELLEVUE, WA 98005

DATE	AUGUST 2018	
DESIGNED	SHERI H. MURATA, P.E.	
DRAWN	DAVID S. VAUGHN	
APPROVED	SHERI H. MURATA, P.E.	
	SHERI H. MURATA, P.E. PROJECT MANAGER	

SHEET C1.04 OF 14

PROJECT NUMBER 17127

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95 MT QUAY DR NW
ISSAQUAH, WA 98027

MEYER WILLIAM
P O BOX 58
ISSAQUAH, WA 98027

ISSAQUAH CITY OF
PO BOX 1307
ISSAQUAH, WA 98027

Affidavit of Sign Installation

CITY OF ISSAQUAH WASHINGTON
Development Services Department
1775 12th Ave. NW, P.O. Box 1307
Issaquah, WA 98027
425-837-3100 DSD@issaquahwa.gov

AFFIDAVIT
OF SIGN INSTALLATION

STATE OF WASHINGTON)
COUNTY OF KING) ss
CITY OF ISSAQUAH)

I/We, Leo Suver ,
being duly sworn depose and say, that I/we are the owner(s) of the property legally described below, and that signage has been posted on said property as specified by the City of Issaquah Land Use Code IMC 18.04.180 Public Notification. The sign was installed on Jan 14th, 2010.

Legal Description: Lot B of Issaquah LLA PLN 12-00027 Recorded in King County Records under recording #2012121390009

Owner's Signature 1/11/20 Date

Mailing Address: 11980 NE 24th street (Street) Bellevue (City) WA (State) 98005 (Zip)

Phone: 425-454-1900 (Business)

Subscribed and sworn to before me this 11 day of January, 2020.

Melissa Kinnee
Notary Public in and for the STATE OF WASHINGTON

Residing at Kirkland WA

MELISSA KINNEE NOTARY PUBLIC 97367 COMMISSION EXPIRES 12-19-23 STATE OF WASHINGTON

AFFIDAVIT OF SERVICE OF MAILING

State of Washington)
County of King)
City of Issaquah)

BRIAN D. MOSS, being first duly sworn, upon oath, deposes and states:

That on the 13th day of JANUARY, 2020, I deposited in the mail of the United States a sealed envelope containing a public hearing notice, decision or recommendation with postage prepaid addressed to the adjacent property and/or parties of record in the below entitled application or petition.

PP18-00002 Notice of public Hearing - Tibbetts Crossing subdivision, preliminary plat map; vicinity map - parcel #2924069041

Brian D. Moss
Signed by

SUBSCRIBED AND SWORN to before me this 13th day of January, 2020

JENNIFER A. WOODS
COMMISSION EXPIRES
NOTARY PUBLIC
11-08-2020
STATE OF WASHINGTON

Jennifer A. Woods
Notary Public in and for the State of Washington
residing at Monroe, WA, therein.
Expiration date: 11-08-2020

Notice of Public Hearing

CITY OF ISSAQUAH WASHINGTON
Development Services Department
1775 12th Ave. NW, P.O. Box 1307
Issaquah, WA 98027
425-837-3100 *DSD@issaquahwa.gov*

Project Name:

Tibbetts Crossing Subdivision

Time: **Tuesday, January 28, 2020, 10:00 am**

Place: **Pickering Room, City Hall Northwest**
1775 12th Ave NW

By: Hearing Examiner

PROJECT INFORMATION

File Number(s): PP18-00002

Project Description: A preliminary plat for the subdivision of approximately 21.94 acres into 20 single-family residential lots. Primary access to the site is proposed from Renton-Issaquah RD SE (SR 900). Infrastructure improvements will include roads, water, sewer and frontage improvements. (See attached Plans)

Project Location: 7932 Renton-Issaquah Rd SE
(See Vicinity Map)

Size of Subject Area in Acres: 21.94 **Sq. Ft.:** 955,706

Applicant: Leo Suver
Steve Burnstead Construction, LLC
11980 NE 24th St, Ste 200
Phone: 425-454-1900; Email: leo@burnstead.com

Decision Maker: Hearing Examiner - Level 4 process

Required City Permits: SEPA, Preliminary Plat

Required City Permits, Not Part of this Application: Final Plat, Site Work, Building, Landscape, Right-of-Way

Required Studies: Wetland, Traffic, Geotechnical, Arborist

Existing Environmental Documents Relevant to this Application: Environmental Checklist

PUBLIC HEARING INFORMATION

Key application documents are available at the City's website: issaquahwa.gov/development. Click on the parcel, then select "View Related Documents and Permits" to see the available submittals. The full application is available for review at the Permit Center, City Hall Northwest, 1775 12th Avenue NW (next to Holiday Inn and behind Lowe's), 9 am – 5 pm. Please make an appointment with the Project Planner.

Comments will be accepted up to and during the Public Hearing. Written comments should be directed to:

Development Services Department
P.O. Box 1307, Issaquah, WA 98027

Or by e-mail to the Project Planner noted below.

To receive further public notices on this project please provide your name, address, and e-mail to the Project Planner and request to become a Party of Record.

Notice is required to be provided to property owners within 300 feet of the site and to Parties of Record. Please share this notice with others in your neighborhood who may be interested in this project. Property owner, Mortgagee, Lien Holder, Vendor, Seller, etc., please share this notice with tenants and others who may be interested in this project.

REGULATORY INFORMATION

Zoning: SF-E - Single Family Suburban Estates

Comprehensive Plan Designation: Low Density Residential

Consistent With Comprehensive Plan: Yes

Preliminary Determination of the Development Regulations that will be used for Project Mitigation and Consistency: Issaquah Municipal Code, Comprehensive Plan

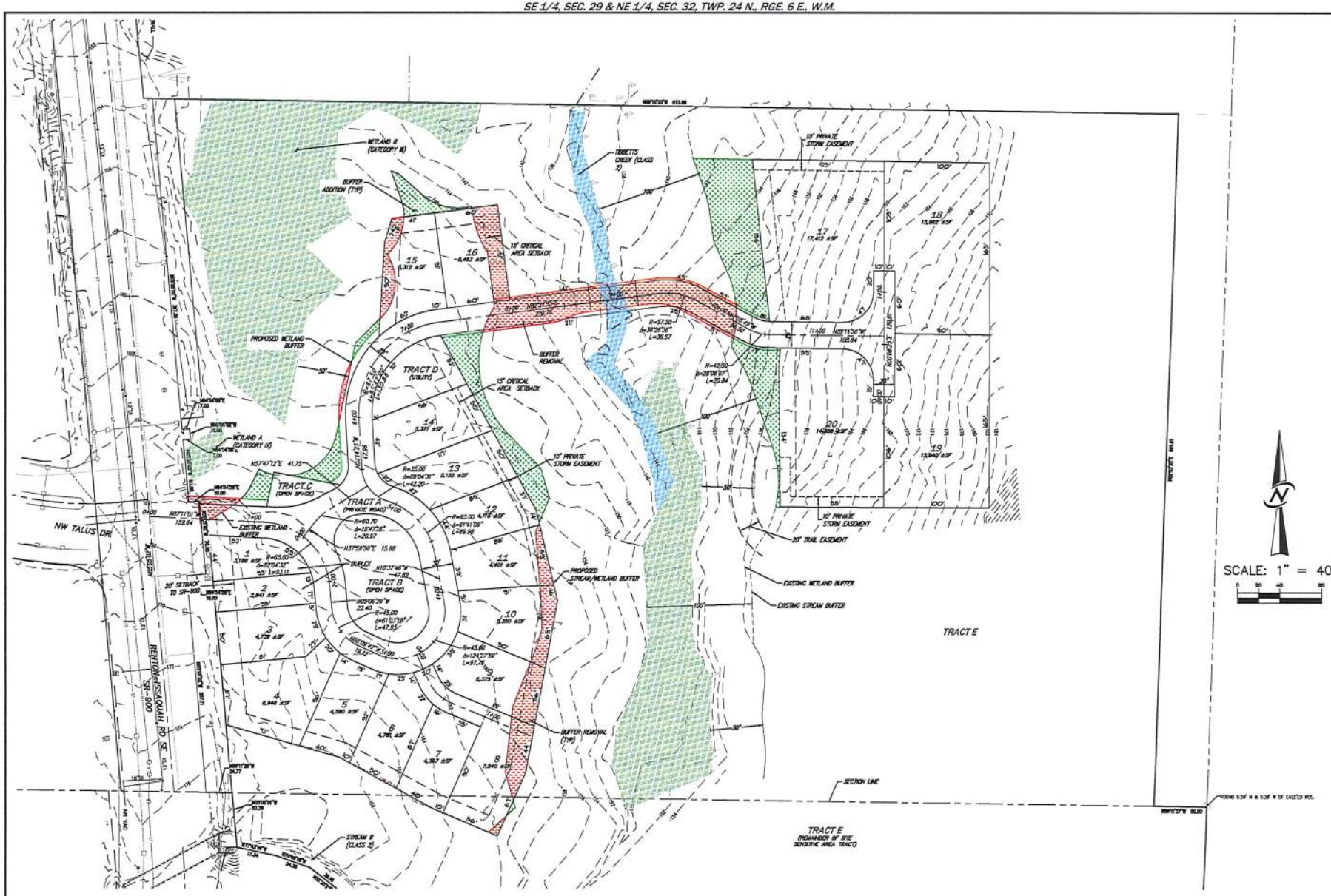
PUBLIC HEARING NOTES:

- The proposal is preliminary and subject to change as a result of the public review process.
- Input from the public will be documented in the permit file and forwarded to the UVDC for their consideration.
- The decision, once rendered, is appealable.

CITY CONTACT INFORMATION

Project Planner:	Valerie Porter, Associate Planner	**Development Services Department:**	
Phone Number:	425-837-3094	**Phone Number:**	425-837-3100
E-Mail:	ValerieP@Issaquahwa.gov	**E-Mail:**	DSD@issaquahwa.gov

SE 1/4, SEC. 29 & NE 1/4, SEC. 32, TWP. 24 N., RGE. 6 E., W.M.



SEE SHEET C1.05

BUFFER AVERAGING
BUFFER ADDITION 14,367 SF
BUFFER REMOVAL 12,914 SF

CORE DESIGN
ENGINEERING • PLANNING • SURVEYING

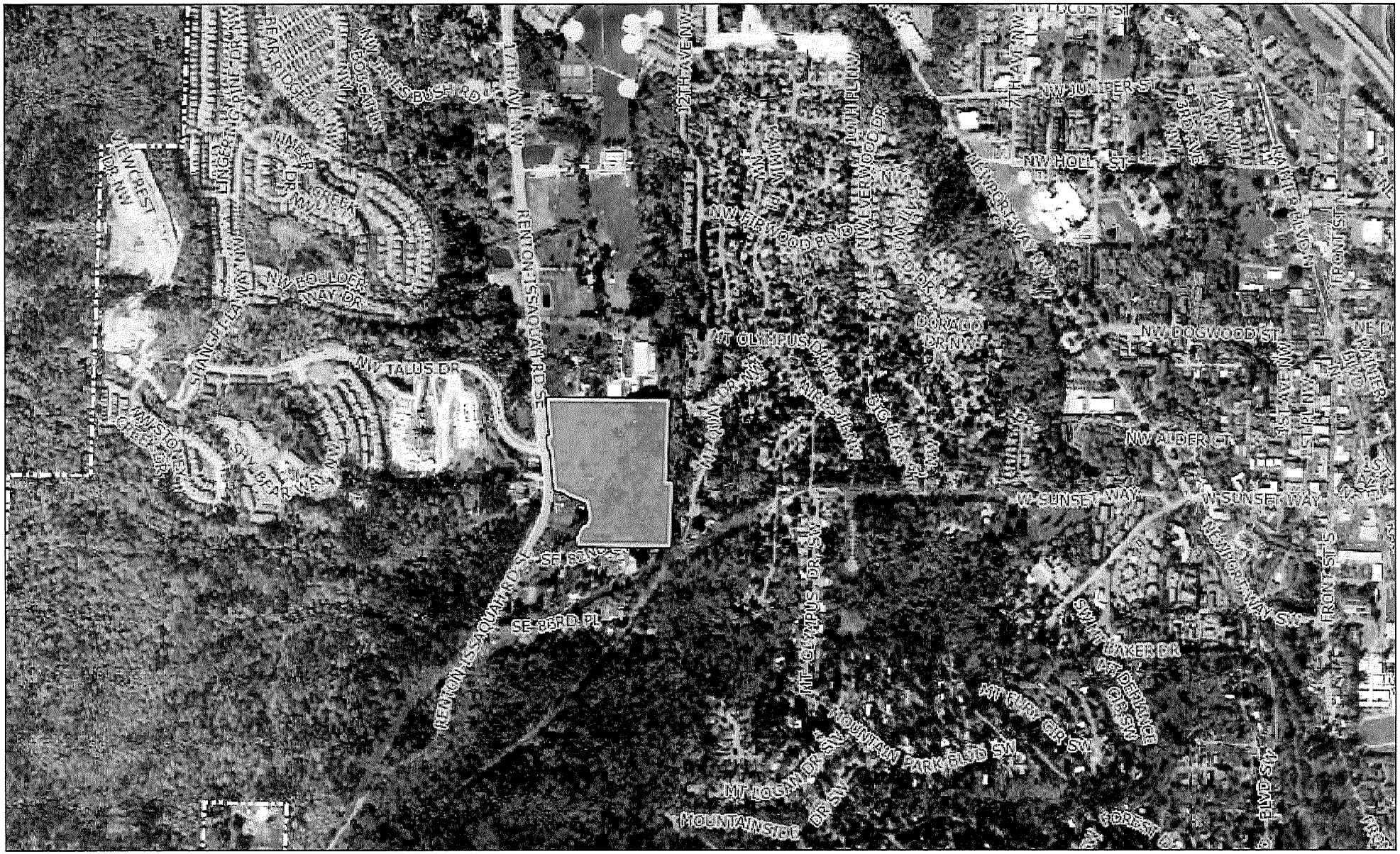
PRELIMINARY PLAT MAP
TIBBETTS CROSSING
STEVE BURNSTEAD CONSTRUCTION, LLC
11580 NE 17TH STREET, SUITE 200
BELLEVUE, WA 98005

DATE	AUGUST 2018	
DESIGNED	SHERI H. MIRAITA, P.E.	
DRAWN	DAVID S. VAUGHN	
APPROVED	SHERI H. MIRAITA, P.E.	PROJECT MANAGER

SHEET C1.04 OF 14

PROJECT NUMBER 17127

Vicinity Map - Parcel No.: 2924069041



2,088.4 0 1,044.18 2,088.4 Feet

1: 12,530

City of Issaquah GIS

DISCLAIMER: These maps and other data are for informational purposes and have not been prepared for, nor are they suitable for legal, surveying, or engineering purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. The City of Issaquah makes no warranty or guarantee as to the content, accuracy, timeliness, or completeness of any of the data provided, and assumes no legal responsibility for the information contained hereon.

RODERICK WYATT
10 MOUNT QUAY DR NW
ISSAQUAH, WA 98027

HAYES STEPHANIE+SPIVEY L
21023 SE 82ND ST
ISSAQUAH, WA 98027

READ DONALD E+DARCY A
383 12TH AVE NW #383
ISSAQUAH, WA 98027

CASCADE WATER ALLIANCE/ATTN
11400 SE 8TH ST STE #440
BELLEVUE, WA 98004

STENSLAND BRADLEY D
21028 SE 82ND ST
ISSAQUAH, WA 98027

LARSON ALLEN K
385 12TH AVE NW #385
ISSAQUAH, WA 98027

STEVE BURNSTEAD CONSTRUCTIO
11980 NE 24TH ST
BELLEVUE, WA 98005

TALUS MANAGEMENT SERVICES
22430 SE 231ST
MAPLE VALLEY, WA 98038

SOMOSKOVI AKOS
387 12TH AVE NW #387
ISSAQUAH, WA 98027

MACHLEID WENDY M
135 MOUNT QUAY DR NW
ISSAQUAH, WA 98027

TALUS MANAGEMENT SERVICES L
22430 SE 231ST ST
MAPLE VALLEY, WA 98038

FOX ANDREA K
389 12TH AVE NW
ISSAQUAH, WA 98027

WOODLEAF PROPERTIES LLC
17722 NE 27TH ST
REDMOND, WA 98052

DINH THI THUY VAN
25 MOUNT QUAY DR NW
ISSAQUAH, WA 98027

SPIERS DANIEL A F+JESSICA A
391 12TH AVE NW
ISSAQUAH, WA 98027

KING COUNTY-PARKS
201 S JACKSON ST #700
SEATTLE, WA 98104

GRIFFITH KRISTIN A+GRIFFITH
30 MT QUAY DR NW
ISSAQUAH, WA 98027

SMITH PATRICIA L
393 12TH AVE NW
ISSAQUAH, WA 98027

ZOU OINGHUA+LU BAOJING
20923 SE 82ND ST
ISSAQUAH, WA 98027

TRAN NAM VAN+DIEU THI MY HU
3028 FIELD ST
LONGVIEW, WA 98632

PEAVEY MICHAEL+ANN
395 12TH AVE NW
ISSAQUAH, WA 98027

ZOU QINGHUA+BAOJING LU
20923 SE 82ND ST
ISSAQUAH, WA 98027

SILVERSTEIN CYNTHIA M
377 12TH AV NW
ISSAQUAH, WA 98027

AFONIN OLGA P
397 12TH AVE NW
ISSAQUAH, WA 98027

HERFORTH MARK B
21017 SE 82ND
ISSAQUAH, WA 98027

GOODSON STEPHEN G
379 12TH AVE NW
ISSAQUAH, WA 98027

BETANCOURT TERRI-ANN
399 12TH AVE NW
ISSAQUAH, WA 98027

ETHRIDGE BRADFORD A+LEONIDA
21021 SE 82ND ST
ISSAQUAH, WA 98027

BURNS ROSEMARY S+MCNICOLL M
381 12TH AVE NW
ISSAQUAH, WA 98027

HOU FRANK X
5221 123RD AVE SE
BELLEVUE, WA 98006

HARRIS SCOTT B+GREENE MICHE
55 MOUNT QUAY DR NW
ISSAQUAH, WA 98027

HAMPTON KENNETH & MARIAN LT
7603 RENTON ISSAQUAH RD SE
ISSAQUAH, WA 98027

HAMPTON KENNETH L+ MARIAN M
7603 RENTON-ISSAQUAH RD SE
ISSAQUAH, WA 98027

ROBERTSON LAWRIE G+GWEN R
7796 RENTON-ISSAQ RD SE
ISSAQUAH, WA 98027

MOORE MARY K+ALEXANDER TODD
7804 RENTON ISSAQUAH RD SE
ISSAQUAH, WA 98027

TALUS CORPORATE CENTER
7900 SE 28TH ST #238
MERCER ISLAND, WA 98040

LEE YONG JO+JUNG SOOK
8007 RENTON ISSAQUAH RD SE
ISSAQUAH, WA 98027

ANDERSON KELLY W
95 MT QUAY DR NW
ISSAQUAH, WA 98027

MEYER WILLIAM
P O BOX 58
ISSAQUAH, WA 98027

ISSAQUAH CITY OF
PO BOX 1307
ISSAQUAH, WA 98027

TRAN TAI V
PO BOX 27799
SETATLE, WA 98165

PUGET SOUND ENERGY/ELEC
PO BOX 97034
BELLEVUE, WA 98009

Daniel Spiers
391 12th Ave. NW
Issaquah, WA 98027

December 2, 2018

Development Services Dept.
P.O. Box 1307
Issaquah WA 98027

Subject: Tibbetts Crossing – Subdivision Notice of Application – File Number: PP18-00002

To Whom It May Concern,

I am writing in response to the Notice of Application I recently received regarding the Tibbetts Crossing Subdivision, File Number: PP18-00002 ("Tibbetts Crossing") and to have both my comments and concerns entered into the public record and for the applicant and/or the City of Issaquah to amend the current plan.

My Questions and Concerns Focus Around the Following:

1. The Tibbetts Crossing proposal is in direct contrast with the Central Issaquah Plan Not in CH Issq
2. The Tibbetts Crossing proposal does not conform to the City of Issaquah's Tree Preservation Ordinance
3. The Tibbetts Crossing proposal does not conform to the City of Issaquah's Sight Ordinance ?
4. Does the Tibbetts Crossing proposal pose a potential landslide risk?

Tibbetts Crossing Proposal Is in Direct Contrast with the Central Issaquah Plan
It is my understanding that one of the central provisions of the Central Issaquah Plan is to focus future land development around Issaquah's downtown area. As a part of that plan, it is intended to reduce development and pressure around the areas of Talus. Given that the site in question is directly across the Renton Issaquah Highway from the Talus entrance, and is outside Issaquah's downtown area, this development appears to be in direct contrast with the Central Issaquah Plan. Not applicable

Conforming to the City of Issaquah's Tree Preservation Ordinance
A large portion of the proposed development site is heavily forested green belt. Given that the City of Issaquah has adopted an ordinance to preserve tree's that are part of the aesthetic beauty of the area, how does the Tibbetts Crossing proposal conform to that ordinance? Furthermore, has the City and/or developer performed an environmental impact assessment on the site to gauge how this development would affect the habitat for local wildlife? Arbor report / SEPA

Conforming to the City of Issaquah's Site Ordinance
There is a City Ordinance that requires that hillside developments be mostly obscured from the valley floor (and vice-versa). Given that my home and several nearby homes rely on the green belt on the Tibbetts Crossing site to obscure our houses, *I am concerned that the current proposal would clear too many trees from the green belt* thus not giving us enough of a buffer and obstruction. In order to guarantee an obstruction, the tree buffer along the North and East sides of the site need to be extended to include more of the current green belt.

Erosion and Landslide Concerns
I have concerns that clear cutting much of the green belt on the proposed site would lead to erosion and increase the risk of a potential landslide. Specifically, trees would need to be cleared to make room for lots 17, 18, 19, and 20, and should a landslide occur, threaten Tibbetts Creek. Given that the Talus development and Issaquah Highlands developments both incurred landslides, I believe my concerns to not be unfounded. Has the developer

conducted the proper due diligence and geotechnical analysis, including having their findings peer reviewed, to ensure that no such occurrence will happen?

As an Issaquah resident and homeowner, I feel that the City of Issaquah and the applicant, needs to address the aforementioned questions, concerns, and where necessary amend the Tibbetts Crossing proposal before the project is allowed to proceed.

I am happy to hear your responses either in writing or at the hearing when a date is set.

Sincerely,

Daniel Spiers

Valerie Porter

From: Balisky, Lauren <lbalisky@kingcounty.gov>
Sent: Tuesday, January 22, 2019 4:14 PM
To: Valerie Porter
Subject: PP18-00002 - Tibbetts Crossing Subdivision

Good afternoon Ms. Porter,

Thank you for providing King County Parks with the opportunity to comment on the proposed 20-lot Tibbetts Crossing subdivision on PIN 2924069041, also known as 7932 Renton-Issaquah Rd SE.

The southeastern edge of the proposed subdivision, currently proposed as a sensitive area tract, includes an area identified as part of the Cedar-to-Sammamish Rivers Trail (CSRT). CSRT is an important connection between the Cedar River Trail and the East Lake Sammamish Trail through the City of Issaquah. CSRT is a planned King County regional trail included in the *Regional Trails Needs Report* under Project ID CS-1, included as Appendix C2 to the adopted 2016 King County Comprehensive Plan Update. The CSRT is also a planned route on the Puget Sound Regional Council's Regional Bicycle Network, which is part of the four-county regional transportation plan serving King, Snohomish, Pierce and Kitsap counties.

King County Parks is in the process of identifying an alignment for CSRT and assembling corridor property for the regional trail. King County currently owns PINs 2924069042 and 2824069177, immediately east of the subject parcel adjacent to the north half.

King County Parks respectfully requests dedication of an easement to connect the property currently owned by King County to the parcel to the south (PIN 3224069032) in a manner that would allow for future trail development.

If you have any further questions, please feel free to contact me by phone or by email.

Sincerely,

Lauren Balisky, AICP, MPA, Real Property Agent
King County Department of Natural Resources & Parks | Capital Planning & Land Management Section
O: (206) 263-6761 | C: (206) 305-8140 | lbalisky@kingcounty.gov
200 Parks | 175 Miles of Trails | 29,000 Acres of Open Space
www.kingcounty.gov/parks | Facebook | Blog

December 3, 2018

Valerie Porter
Project Planner
City of Issaquah
Development Services Department
PO Box 1307
Issaquah, WA 98027

Re: Tibbetts Crossing subdivision

Ms. Valerie Porter:

We have had an opportunity to meet Mr. Leo Suver of Burnstead Construction and communicate regarding the proposed development. Our initial conversations have been positive. This memo serves to communicate two specific we concerns we have regarding residences being built adjacent to our property.

Our greenhouse and nursery have been in operation on the same location since 1974. New development has the potential to create harmful potential light pollution and make access to our property easier resulting in a higher probability of theft from our nursery. We believe mitigation of these concerns by the developer is achievable.

We grow crops that can be permanently ruined if artificial light shines on the crops during natural hours of darkness. We request that street lights and other permanent lighting be designed in such a way that the light does not flood into our greenhouses.

The nursery area in which we stock product is set off SR900 (Renton-Issaquah Road SE) by at least 500 feet. We have a gate near SR900 that is closed and locked when the business is closed. The distance creates a natural barrier to theft. Lots 17 and 18 of the proposed development have property lines that are within 30' (approximately) of production greenhouses. We request that fencing and driveways be designed in such a way that there is no way for vehicles to access our property from roads or driveways in the development. Also we would hope that individuals driving vehicles off SR900 would have a difficult time parking and then walking on to our property.

Our family has enjoyed serving our community for more than 40 years at Squak Mt. Nursery. We welcome new neighbors, and look forward to proactive solutions to these concerns. Thank you for your consideration in these matters. If you have any questions please feel free to contact me.

Sincerely,

Matt Pommer
Squak Mt. Greenhouses and Nursery
7600 Renton-Issaquah Road SE
Issaquah, WA 98027
425-392-1025
matt@squakmtnursery.com