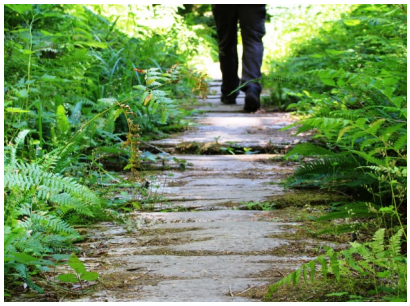
CRITICAL AREAS REPORT

October 14, 2019



Faust Permitting

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SIGNATURES

The information and data in this report were compiled and prepared under the supervision and direction of the undersigned.

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INTRODUCTION

Ecological Land Services, Inc. (ELS) was contracted by Alisa Faust to conduct a critical areas determination for Clark County Tax Parcels 258640-000 and 258755-000 for the purpose of constructing a single-family residence with attached garage, septic system, gravel driveway, and culvert. ELS conducted a critical areas determination to determine the presence and extent of critical areas onsite; this report summarizes ELS' findings according to the *Clark County Unified Development Code (CCC) Chapter 40.440: Habitat Conservation* (CCC 2019) and *La Center Municipal Code (*LCMC, 2019) *Title 18.300*: *Critical Areas*.

PROJECT DESCRIPTION

PROJECT LOCATION

The subject property is located north of 34100 Northwest Pacific Highway in La Center, Washington, within a portion of Section 33, Township 5 North, and Range 1 East of the Willamette Meridian (Sheet 1). For the purposes of this project, Parcels 258640-000 and 258755-000 will be referred to as the study area. Jenny Creek, a Type F (fish-bearing) stream, flows southwest near the southern portion of the study area, and an unnamed, Type Ns (seasonal, non-fish-bearing), stream flows southwest through the western portion. For the purposes of this report, the unnamed stream will be referred as Stream 1. The proposed gravel driveway will provide access from Northwest Pacific Highway through the northwest portion of the study area, with the proposed residence and septic system located in the northern portion, and the proposed culvert located in the western portion (Sheet 3).

CONSTRUCTION ACTIVITIES

The proposed project consists of constructing an approximately 2,835-square foot single-family residence with attached garage and gravel driveway. An approximately 3,037-square foot portion of the gravel driveway and required grading will be located within the riparian buffer of the unnamed stream. To provide access to the central portion of the property, the gravel driveway will cross the unnamed stream onsite (Stream 1). To facilitate continued flow within the Stream 1, an approximately 16-foot long and 16-inch wide bottomless arch culvert will be installed in the western portion of the study area, allowing drainage to continue upon project completion. Culvert installation specifications are detailed in the "Culvert Design Specifications" paragraph below. Water and electric utilities will be extended northeast via Northwest Pacific Highway and will be buried under the proposed driveway to service the home; the lines will be attached to the proposed culvert. A septic drain-field and reserve drain-field servicing the home will be installed approximately 10-feet north of the residence, outside of all critical areas. A grass-lined trench with a system of check dams will be installed along the entire length of the driveway to reduce the velocity of water running downslope and trap sediment. Check dam specifications are included in the "Check Dam Design Specifications" paragraph below. Runoff generated from the residence and attached garage will be directed to three downspouts which will discharge at least 5 feet from the home onto splash blocks. The splash blocks reduce erosion and scour, and will reduce the velocity of water running downslope facilitating infiltration. Splash block specifications are included in the "Splash Block Design Specifications" paragraph below. Silt-fencing will be installed along the edges of the stream banks in the vicinity of the driveway crossing to limit potential erosion and prevent impacts to water quality. Additionally, silt fencing will be installed

along the entire eastern, southern, and western portions of the home for the duration of construction. Installation of the driveway will require removing up to 10 trees within the riparian buffer of Stream 1. Trees required for removal consist of no more than 5,000-board feet of Douglas-fir (*Pseudotsuga menziesii)* and Oregon ash (*Fraxinus latifolia*). To mitigate for additional impervious surfaces and tree removals in the riparian buffer, a total of 105 native shrubs will be installed within an approximately 4,000-square foot enhancement area. Shrubs selected for compensatory mitigation include 35 red-flowering currant (*Ribes sanguineum*), 35 common snowberry (*Symphoricarpos albus*), and 35 Indian plum (*Oemleria cerasiformis*). Equipment used for construction may include an excavator, tractor, haul truck, and hand tools (Sheet 3).

Culvert Design Specifications

The approximately 16-inch wide and 16-foot long bottomless arch culvert will be designed based on the specifications outlined in the Washington Administrative Code (WAC) *Chapter 220-660-190* (WAC 2019). Based on WAC specifications, the proposed culvert will be installed at a zero-gradient, will be "countersunk a minimum of twenty percent of the culvert rise at the culvert outlet downstream", and "the span must be equal to or greater than the average channel bed width" (WAC 2019). The channel of Stream 1 is approximately 6- to 12-inches wide, therefore, the installed culvert will be 16-inches wide to ensure the minimum culvert diameter is achieved and the culvert can withstand storm events. The bottomless arch culvert will span the entire length of the ordinary high-water mark (OHWM), therefore no construction will occur within the stream channel. Furthermore, the proposed culvert will be designed to allow the stream to pass wood and sediment expected to be present within the stream during the wet season, reducing the risk of catastrophic failure of the crossing. Anticipated debris within Stream 1 includes small materials such as fir needles and potentially leaf litter, therefore, a minimum diameter of 16-inches will ensure flow through the culvert is maintained. Equipment used to install the culvert may include an excavator, tractor, haul truck, and hand tools (Sheet 3).

Check Dam Design Specifications

An approximately 4-foot wide and 2-foot deep trench will be constructed along the entire length of the gravel driveway between the stream crossing and the residence (Sheet 3). A system of check dams will be installed at approximately 30-foot intervals within the ditch to improve water quality and reduce the velocity of water running downslope. The check dams will be installed perpendicular to the flow of water and will be constructed with quarry spall filled bags. The trench will also be grass-lined with a native blue wild rye (*Elymus glaucus*) seed mix to further reduce the velocity of water running downslope and trap sediment (Figure 5). Maintenance of the check dams will include removing accumulated sediment once is reaches 1/3 the height of the dam and disposing of it outside of critical area buffers.

Splash Block Design Specifications

Runoff generated from the residence and attached garage will be directed to three downspouts that discharge to splash blocks located approximately 5 feet from the home on the downslope side (Sheet 3). The splash blocks will adequately disperse storm runoff generated from the roof facilitating infiltration . An example splash block design is included in Figure 6. Splash blocks typically require at least a 50-foot vegetated flowpath to be effective. Jenny Creek is located at least 210 feet downslope from the residence and is well-vegetated, therefore, any impurities generated from the roof will be adequately filtered and infiltrated prior to reaching the stream.

SITE DESCRIPTION

The approximately 5.48-acre study area is zoned as low density residential (LDR-7.5) by the City of La Center. The entirety of the study area is forested with a southeast facing slope. No development currently exists onsite. Dominate upland vegetation on the property consists of Douglas-fir, Oregon ash, Oregon Crab apple (*Malus fusca*), beaked hazelnut (*Corylus cornuta*), Indian plum (*Oemleria cerasiformis*), western swordfern (*Polystichum munitum*), creeping buttercup (*Ranunculus repens*), youth-on-age (*Tolmiea menziesii*), trailing blackberry (*Rubus ursinus*), and Himalayan blackberry (*Rubus armeniacus*). Surrounding properties consist of single-family residences and regularly mowed fields, and all surrounding properties are zoned as low density residential (LDR-7.5) by the City of La Center. Northwest Pacific Highway runs northwest to southeast and forms the southern study area boundary.

Two streams were identified onsite during the site visit, including Jenny Creek, a Type F stream, and an unnamed and uncategorized stream (Stream 1). Jenny Creek originates in the southeast corner of the study area and flows southwest offsite along the southern study area boundary before intersecting a culvert along Northwest Pacific Highway. After intersecting the culvert, Jenny Creek flows south for approximately 2,000 feet before draining into the East Fork Lewis River. At the time of the site visit, Jenny Creek was approximately 1- to 2-feet wide with minimal flow. Stream 1 originates in the western portion of the property and meanders southeast for approximately 430 feet before intersecting Jenny Creek in the central portion of the study area (Sheet 2). During the site visit, the stream channel was approximately 6- to 12-inches wide with steep, sloped sides consisting of soil with leaf litter. The stream channel was dry and lacked suitable substrate for fish spawning or rearing. Based on guidance from *WAC 22-16-031(3)*, it is ELS' opinion that Stream 1 is a seasonal, non-fish bearing stream (Type Ns) (WAC 2019). ELS' stream typing was approved by a Washington Department of Fish and Wildlife (WDFW) representative, Chuck Stambaugh-Bowey, on September 5, 2019. More information regarding stream typing is included in the "Stream Typing" section of this report. Dominant vegetation observed in the riparian environments onsite consisted of Douglas-fir, Oregon ash, western swordfern, creeping buttercup, youth-on-age, trailing blackberry, and Himalayan blackberry.

METHODOLOGY

The property was evaluated for the presence of wetlands using the Routine Determination Method according to the U.S. Army Corps of Engineers' 1987 *Wetland Delineation Manual* and the *Regional Supplement to the Corps of Engineers' Wetland Delineation Manual* (Environmental Laboratory 1987)*; Western Mountains, Valleys, and Coast Region (Version 2.0)* (Corps 2010). The Routine Determination Method examines three parameters—vegetation, soils, and hydrology—to determine if wetlands exist in a given area. Hydrology is critical in determining what is wetland, but is often difficult to assess because hydrologic conditions can change periodically (hourly, daily, or seasonally). Consequently, it is necessary to determine if hydrophytic vegetation and hydric soils are present, which would indicate that water is present for long enough duration to support a wetland plant community. By definition, wetlands are those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands are regulated as "Waters of the

United States" by the U.S. Army Corps of Engineers (Corps), "Waters of the State" by Washington Department of Ecology (Ecology) and locally by Clark County (CCC).

ELS conducted a site visit on July 16, 2019 to collect vegetation and hydrology data, and to make a determination about the presence or absence of critical areas on and offsite. Given the prevalence of upland vegetation and lack of hydrology onsite, ELS determined no test plots were necessary. The study area consisted primarily of Douglas-fir and western swordfern, both of which are indicative of upland environments (Photoplate 1). ELS identified two streams onsite, including an unnamed stream (Stream 1) and a portion of Jenny Creek (Sheet 2).

In addition to the wetland delineation, the OHWM of Jenny Creek and the unnamed stream were determined using standard methodology as described in the Washington State Department of Ecology (Ecology) manual: Determining the Ordinary High Water Mark on Streams in Washington State (Olson and Stockdale 2010). The main indicators used to determine the OHWMs were scour along the stream edges and exposed roots, as well as changes in topography. In this case, the OHWM of Jenny Creek and Stream 1 were determined to be synonymous with their top of banks. The channel of Stream 1 is only 6- to 12-inches wide, therefore a single OHWM line was used to depict the OHWM of the stream, given the stream channel is narrower than the line depicted in Figures 2 and 3. Stream centerline locations and OHWMs were mapped using a handheld GPS unit with sub-meter accuracy (Sheets 2 and 3).

WETLAND AND STREAM INVENTORIES

The National Wetland Inventory (NWI) map indicates the presence of a semi-permanently flooded riverine wetland located in the eastern portion of the study area and continuing southwest along the southern study area boundary (Figure 2). The Clark County Wetland Inventory (CCWI) map indicates the presence of a wetland system in approximately the same area as NWI (Figure 3). ELS findings were not consistent with NWI and CCWI maps, as no wetlands were observed onsite. The wetlands indicated by the NWI and CCWI maps are located in the same general area as Jenny Creek and therefore are likely a reflection of a riparian environment, not wetlands. NWI and CCWI maps are typically used to gather wetland information about a region and due to the large scale necessary for regional mapping are limited in accuracy for localized analyses.

The Washington Department of Natural Resources (DNR) Stream Type map indicates the presence of a Type F stream that flows southwest along the southern study area boundary and continues south offsite. Additionally, DNR indicates the presence of an unnamed and untyped stream (Stream 1) that flows south through the central portion of the study area before intersecting the Type F stream (Jenny Creek) (Figure 4). ELS findings were generally consistent with DNR mapping (DNR 2019), as the centerlines of Jenny Creek and Stream 1 were delineated in the same general locations. However, the centerline of Stream 1 was mapped closer to the southern portion of the study area, and the stream type was determined to be Type Ns based on guidance from *WAC 22-16-031(3)* and a WDFW representative Chuck Stambaugh-Bowey (WAC 2019). More information regarding stream typing is included within the "Stream Typing" section of this report. DNR stream inventories are typically used to gather hydrologic data about a region and due to the large scale necessary for regional mapping are limited in accuracy for localized analyses.

STREAM TYPING

Stream 1 is not currently categorized by DNR (Figure 4) (DNR 2019). However, ELS determined Stream 1 to be a seasonal, non-fish bearing stream (Type Ns) based on guidance from WAC and a WDFW representative Chuck Stambaugh-Bowey (WAC 2019). According to *WAC 22-16-031(3)*, Stream 1 is a "Type 3 Water," or a body of water "which is not classified as Type 1 or 2 Waters and has moderate to slight fish, wildlife, or human use. The WAC dictates that Type 3 Waters having any of the following characteristics are presumed to have fish use:

> *(A) Stream segments having a defined channel of 2 feet or greater within the bankfull width in Western Washington; or 3 feet or greater in width in Eastern Washington; and having a gradient of 16 percent or less;*
>
> *(B) Stream segments having a defined channel of 2 feet or greater within the bankfull width in Western Washington; or 3 feet or greater within the bankfull width in Eastern Washington, and having a gradient greater than 16 percent and less than or equal to 20 percent, and having greater than 50 acres in contributing basin size in Western Washington or greater than 175 acres contributing basin size in Eastern Washington, based on hydrographic boundaries.*

Stream 1 does not meet either of the above criteria (A or B). The stream channel is approximately 6- to 12-inches wide with steep, sloped sides consisting of soil with leaf litter and vegetation consisting primarily of sword ferns and other upland shrubs (Photoplate 1). There was not suitable substrate for fish spawning or rearing within the stream channel. This stream channel does not serve as a migratory path as its headwater is a small depressional wetland located just offsite to the west. Given Stream 1 does not meet either of the above criteria, it is ELS' opinion that the stream is a seasonal, non-fish bearing stream (Type Ns). Chuck Stambaugh-Bowey from WDFW approved this stream type designation on September 5, 2019.

CRITICAL AREAS SUMMARY

Jenny Creek

Jenny Creek is a fish-bearing (Type F) stream located primarily offsite to the south, with portions intersecting the southeast and southwest corners of the study area. During the site visit, the stream channel was approximately 1 to 2 feet wide with minimal flow. In this case, the channel width was synonymous with the OHWM. Jenny Creek flows southwest along the southern study area boundary before intersecting a culvert on Northwest Pacific Highway. After intersecting the culvert, the stream flows south for approximately 2,000 feet before connecting with the East Fork Lewis River. According to *LCMC Table 18.300.090(2)(f)*, a Type F stream has a designated buffer width of 200 feet (LCMC 2019) (Sheet 2).

Stream 1

Stream 1 was determined to be a seasonal, non-fish-bearing stream (Type Ns) based on guidance from *WAC 22-16-031(3)* and a WDFW representative Chuck Stambaugh-Bowey (WAC 2019). Stream 1 is located in the western portion of the study area. During the site visit, the stream channel was approximately 6- to 12-inches wide and was dry. In this case, the stream channel was

synonymous with the OHWM. Stream 1 flows east through the central portion of the study area before draining into Jenny Creek. According to *LCMC Table 18.300.090(2)(f)*, a Type Ns stream has a designated buffer width of 75 feet (LCMC, 2019) (Sheet 2). Table 1 summarizes the critical areas onsite.

Table 1. Summary of Critical Areas Onsite.

Critical Area	Water Type[1]	Buffer[1]
Jenny Creek	Type F (fish-bearing, perennial)	200 feet
Stream 1	Type Ns (non-fish-bearing, seasonal)	75 feet

[1]*LCMCTable 18.300.090(2)(f)*

IMPACT AVOIDANCE AND MINIMIZATION MEASURES

The preferred sequence of first avoidance, then minimization, and finally compensation for unavoidable impacts was taken into consideration throughout the design process of this project. The proposed location of the residence and septic systems were selected to avoid all riparian habitat buffers onsite. Additionally, the location of the proposed driveway was selected to avoid as much of the riparian habitat buffers as possible. Only a small portion (approximately 3,037 square feet) of the driveway and required grading will encroach on the 75-foot buffer of Stream 1. The proposed driveway will be located entirely outside the 200-foot riparian buffer of Jenny Creek. Alternative configurations of the gravel driveway would require additional impacts to the riparian buffer of Stream 1, or impacts to the buffer of Jenny Creek. The proposed driveway is the minimum width required (12 feet), and the proposed route is the most direct possible. Fish-bearing streams provide habitat to native fish species, therefore careful consideration was made to ensure the gravel driveway will not affect the riparian buffer associated with Jenny Creek. Access to the interior of the study area would not be possible without crossing Stream 1, therefore, the project involves installing an approximately 16-foot long and 16-inch wide bottomless arch culvert in the western portion of the study area where the gravel driveway intersects Stream 1. The culvert will span the entire width of the OHWM, will be installed while the stream channel is dry, and will be counter-sunk approximately 20 percent. Upon project completion, the culvert will allow seasonal flow within Stream 1 to continue uninterrupted. Any material from the driveway inadvertently sloughing into the channel will be removed by hand and will be disposed of onsite outside of critical areas and buffers. Water quality and erosion control best management practices are described in the "Erosion and Water Quality" paragraphs below. Once construction is complete, disturbed areas will immediately be seeded with a native blue wild rye seed mix and mulched.

Erosion Control and Water Quality

The proposed gravel driveway will result in approximately 4,500 square feet of new impervious surfaces on the property. Potential runoff generated from the driveway will be treated onsite via a system of check dams installed at 30-foot intervals within an approximately 4-foot wide and 2-

foot deep grass-lined trench, which will be dug along the entire length of the proposed driveway between the residence and stream crossing. The system of check dams will be constructed concurrently with the gravel driveway and will reduce the velocity of concentrated flow, ensuring potential erosion caused by driveway-generated runoff is minimized. Check dams utilized in conjunction with grass-lined trenches are more effective at retaining sediments, therefore, any impacts to water quality are expected to be minimal. Check dam design specifications are outlined in Figure 5. The system of check dams will be retained upon project completion to ensure driveway-generated runoff is managed onsite in perpetuity.

The proposed residence will result in approximately 2,800 square feet of new impervious surfaces on the property. To facilitate energy dissipation, potential runoff generated from the residence will be directed to three downspouts that discharge to splash blocks located approximately 5 feet from the home (Sheet 3). The splash blocks will ensure energy generated from roof runoff will be dissipated prior to reaching the soil. The efficacy of splash blocks is greatly improved if a vegetated flowpath of at least 50 feet is maintained between the discharge point and any property line, structure, stream, wetland, lake, or other impervious surface. Given Jenny Creek is located at least 210-feet downslope from any downspout discharge point, potential impurities generated from roof-runoff will be adequately filtered prior to reaching the stream. Furthermore, the riparian buffer of Jenny Creek is well vegetated with herbaceous upland vegetation, therefore, no impacts to water quality within Jenny Creek are expected to occur as a result of this project. Silt fencing will be installed along the entire eastern, southern, and western portion of the residence throughout the duration of construction to further reduce the likelihood of erosion or water quality impacts (Sheet 3). Additional best management practices include the following:

- Limiting ground disturbance to that necessary for implementation of project elements.
- Locating staging areas and stockpiled materials outside of riparian buffers.
- Keeping equipment properly functioning and checking for fuel leaks at the beginning of each day of construction.
- Demarcating the riparian buffers prior to construction.
- Seeding or otherwise stabilizing disturbed areas immediately following installation of project elements.
- Designing the bottomless arch culvert to meet the standards outlined in *WAC 220-660-190.*

The proposed location of the gravel driveway minimizes the area of new impervious surfaces within riparian buffers and minimally disturbs existing vegetation. Installing 105 native shrubs onsite within the vicinity of the driveway will ensure no-net-loss of ecological functions (Sheet 3).

MITIGATION

Due to the addition of new impervious surfaces, the proposed project will impact approximately 3,037 square feet of the riparian buffer associated with Stream 1. Furthermore, the driveway will require removing up to 10 trees within the riparian buffer area, which will consist of Douglas-fir and Oregon ash. No more than 5,000 board feet of Douglas-fir and Oregon ash will be removed. A mitigation ratio of 1:1 is proposed for impervious surface impacts and tree removals within the riparian buffer, which will be mitigated for via riparian buffer enhancement. Compensation for

riparian buffer impacts will involve installing 105 native shrubs within an approximately 4,000-square foot enhancement area located in the western portion of the study area (Sheet 3). Shrubs selected for compensatory mitigation were chosen based on their current prevalence within riparian habitats onsite and their propensity to tolerate variable conditions. Installed shrubs will include 35 red-flowering currant, 35 common snowberry, and 35 Indian plum. The shrubs will be installed with 6-foot on-center spacing to facilitate water quality improvement and provide greater habitat opportunities than currently provide by the riparian buffer of Stream 1. The riparian buffer associated with Stream 1 is primarily forested with minimal shrubs in the understory, therefore, establishing additional shrub structure in the understory will increase habitat diversity in the riparian habitat. Invasive Himalayan blackberry will be removed from planting locations to reduce its prevalence on the property and limit competition with compensatory mitigation plantings. Himalayan blackberry will first be mowed, and then the roots and stems will be removed by hand. This will occur prior to planting in early spring following permit approval. Native grass seed consisting of blue wild rye will be spread over bare areas and mulch will be applied. Table 2 summarizes the proposed mitigation, and Table 3 summarizes mitigation plantings within the enhancement area.

Table 2. Summary of Impacts and Proposed Mitigation

Location	Type of Impact	Impact Amount	Minimum Mitigation Ratio	Mitigation Amount Proposed	Mitigation Activities
Stream 1	Riparian Buffer Impact	3,037 sq. ft.	1:1	4,000 sq. ft. Riparian Buffer Enhancement	▪ Install 105 Native Shrubs ▪ Remove Himalayan Blackberry

GOALS, OBJECTIVES, AND PERFORMANCE STANDARDS

The goal of riparian buffer enhancement is to provide an ecological functional lift to the riparian buffer of Stream 1 to compensate for 3,037-square feet of impacts associated with new impervious surfaces in the buffer and culvert installation. Approximately 4,000-square feet of the riparian buffer will be enhanced via removal of invasive Himalayan blackberry, as well as other invasive species, and by virtue of planting native shrubs to achieve overall higher functions than those provided by existing conditions. To accomplish this goal, the following objectives and performance standards are appropriate to ensure the success of the riparian enhancement area:

Vegetation

Objective 1. Enhance a minimum of 4,000 square feet of riparian buffer by removing non-native species such as Himalayan blackberry.

Performance Standard 1a: Remove existing invasive species from at least 4,000 square feet in the riparian enhancement area. Document the removal of invasive plants within the enhancement areas in the as-built report.

Performance Standard 1b: In all years, non-native, invasive plant species will not exceed 10 percent aerial cover within the riparian enhancement area. Percent cover of invasive species will be documented in annual monitoring reports.

Objective 2. Enhance a minimum of 4,000 square feet of the existing riparian plant community by planting 105 native shrubs within the riparian buffer.

Performance Standard 2a: Install native shrubs at spacing intervals of at least 6-foot on-center within at least 4,000 square feet of the riparian buffer and document in as-built report.

Performance Standard 2b: In Year 1, planted species will achieve 100 percent survival. If dead plants are replaced, this performance standard will be met. Document in annual monitoring report.

Performance Standard 2c: In Year 3, planted species will achieve 90 percent survival. If dead plants are replaced, this performance standard will be met. Document in annual monitoring report.

Performance Standard 2d: In Year 5, planted species will achieve 90 percent survival. If dead plants are replaced, this performance standard will be met. Document in annual monitoring report.

Performance Standard 2e: In Year 7, planted species will achieve 90 percent survival. If dead plants are replaced, this performance standard will be met. Document in annual monitoring report.

Planting Plan

Site Specifications

1. Stake or flag the buffer boundaries.
2. Stake or flag the enhancement area boundaries.
3. Remove invasive species.

Planting Specifications

The proposed planting plan consists of installing common native shrub species onsite within the riparian enhancement area to encourage the development of a dense, multilayered understory community, resulting in varied habitat opportunity. Shrubs selected for installation within riparian enhancement area were chosen based on their propensity to withstand variable conditions and included common snowberry, red-flowering currant, and Indian plum. Mitigation plantings will be installed in the late fall to early spring when the site conditions are wettest and the plants are dormant. Additionally, plants will be installed in mono-specific groups to better mimic the natural environment and enhance plant survival. Gallon stock was selected for shrub installations given the quantity necessary for enhancement. Furthermore, the selected species were observed elsewhere onsite and appeared healthy, therefore environmental conditions onsite are likely ideal for the selected species. Mitigation plantings will be installed with tree protection tubes if needed to discourage herbivory and further increase the survivability of planted shrub species. Table 3 summarizes the plant species, spacing, and quantities for the enhancement area.

Table 3. Plant Specifications

Common Name	Scientific Name	Size	Spacing	Amount
Shrubs				
Red-flowering currant	*Ribes sanguineum*	Gallon	6-foot on-center	35
Snowberry	*Symphoricarpos albus*	Gallon	6-foot on-center	35
Indian plum	*Oemleria cerasiformis*	Gallon	6-foot on-center	35
			Total	**105**

Plant Material Specifications

1. Gallon species will be purchased from a native plant nursery.
2. Gallon plants will be a minimum size of 12- to 18-inches tall.
3. Gallon stock will be kept cool and moist prior to being planted.
4. Gallon stock will have well-developed roots and sturdy stems, with an appropriate root-to-shoot ratio.
5. Unplanted gallon stock will be properly stored at the end of each day.
6. The environmental consultant will be responsible for inspecting gallon stock prior to and during planting, culling unacceptable plant materials.

Planting Implementation

1. Plant the specified shrubs in the fall (October-November) or early spring (March-April) at the intervals listed in Table 3. Space the plants somewhat irregularly and in groups to create heterogeneity in the density and appearance of the enhancement areas. Plant the gallon stock with a tree shovel or comparable tool.
2. Place the gallon species in the planting holes so that their roots are able to extend down entirely and do not bend upward or circle inside the hole (no "J" or "U" roots).
3. Position the root crowns so that they are at or slightly above the level of the surrounding soil.
4. Compact the soil around the planted species to eliminate air spaces.
5. Irrigate all newly installed plants as site and weather conditions warrant.
6. Place tree protection tubes if needed around planted shrub species to discourage herbivory.

Monitoring and maintenance will occur for seven years (years 1, 3, 5, and 7) and will be conducted by the applicant (unless otherwise assigned). Monitoring will consist of counting planted shrubs to ensure their survival. Maintenance will occur as needed and will consist of mowing or weed eating around the bases of plantings to lessen competition from grasses, watering, replacing failed plantings, and removing non-native species in the enhancement areas.

Monitoring will occur between April and August of each monitoring year and a letter will be submitted to the City of La Center by September 30th during each monitoring year: Year 1 (one growing season after shrubs are installed), Year 3, Year 5, and Year 7. Monitoring reports will consist of a letter with the following information:

- Permit number
- Project location
- Number of species planted
- Number of failed plantings (if any)
- Statement of whether performance standards have been achieved
- Picture(s) of the planting area taken from the same location each year
- Summary of maintenance efforts

If performance standards are not being met, a contingency plan will be developed and approved by the City of La Center that details the following:

- Cause(s) of failure
- Proposed corrective actions
- Time-frame for completing corrective actions
- Whether additional maintenance and monitoring is necessary

Contingency Plan

If the performance standards are not met by the third year following plant installation, a contingency plan will be developed and implemented. All contingency actions will be undertaken only after consulting and gaining approval from the City of La Center. This project will be required to complete a contingency plan that describes: (1) the causes of failure, (2) proposed corrective actions, (3) a schedule for completing corrective actions, and (4) whether additional maintenance and monitoring are necessary.

CONCLUSION

The proposed project will result in approximately 3,037 square feet of impacts to the riparian buffer of Stream 1 associated with the addition new impervious surfaces and removal of up to 10 trees. However, mitigation measures consisting of removing invasive species and planting 105 native shrubs within the 4,000-square foot riparian enhancement area will adequately compensate for impacts and ensure no net loss of ecological functions and values. The proposed mitigation measures will improve the riparian habitat over existing conditions on the property, as the mitigation plantings will encourage development of a multi-layered shrub stratum within the riparian enhancement area wherein existing vegetation is primarily contained within the forested stratum. The proposed 16-inch wide and 16-foot wide bottomless arch culvert satisfies the standards outlined by *WAC 220-660-190* and will allow seasonal drainage within Stream 1 to continue upon project completion (WAC 2019). The culvert will span the entire length of the OHWM, therefore no construction will occur within the stream. There are no anticipated impacts from project-associated runoff that could affect water quality or the function of the riparian buffer of Stream 1 because best management practices will be in place prior to, and for the duration of construction, including keeping equipment out of the riparian buffers, immediately reseeding disturbed areas with blue wild rye, installing silt-fencing on the banks of Stream 1 in the vicinity of the driveway and along the entire downslope portion of the residence, and installing a system of check dams within a 4-foot wide and 2-foot deep grass-line trench located along the entire length of the gravel driveway between the residence and the stream crossing. Additionally, no impacts associated with roof-generated runoff are expected to occur as a result of this project because

runoff will be directed to three downspouts that will discharge into splash blocks located 5 feet from the residence.

LIMITATIONS

ELS bases this report's determinations on best available science, standard scientific methodology, and best professional judgment. In our opinion, local, state, and federal regulatory agencies should agree with our determinations. However, the information contained in this report should be considered preliminary and used at your own risk until it has been approved in writing by the appropriate regulatory agencies. ELS is not responsible for the impacts of any changes in environmental standards, practices, or regulations after the date of this report.

REFERENCES

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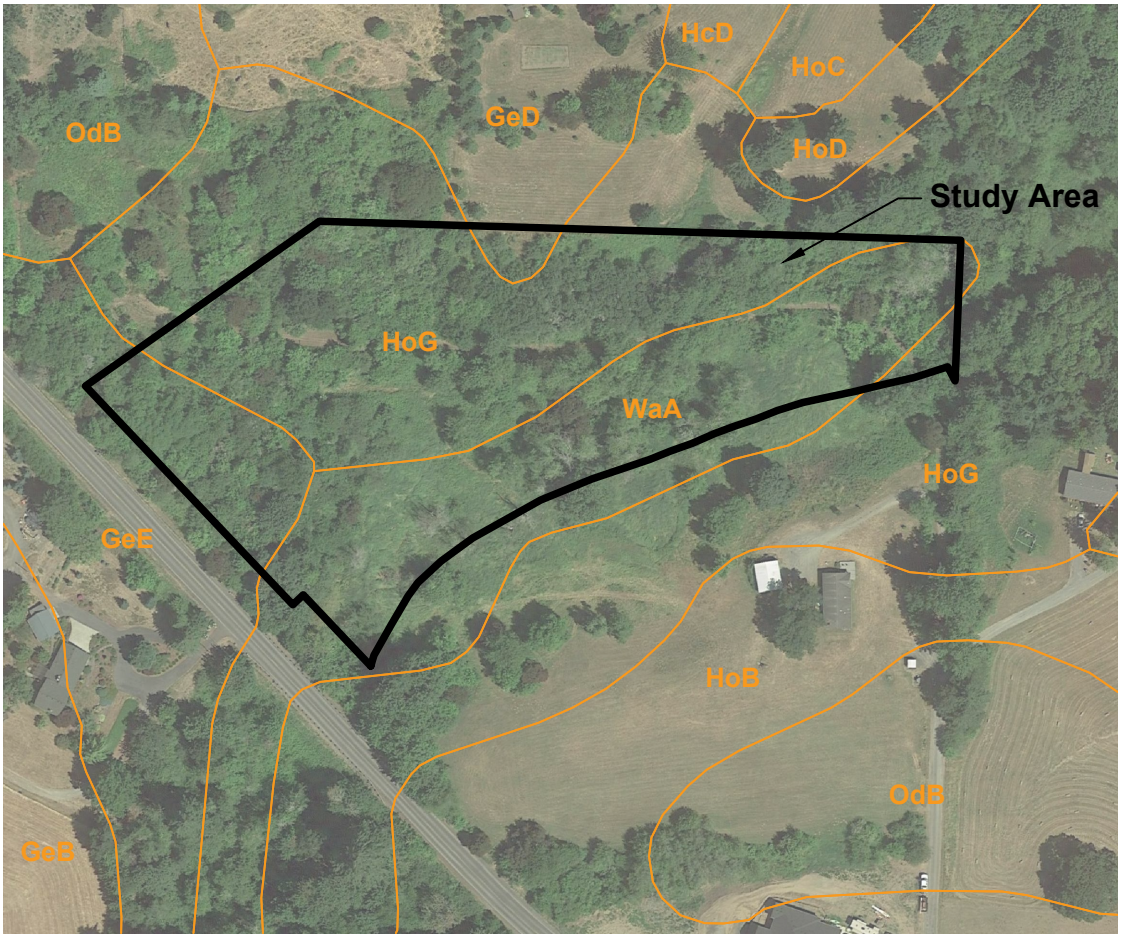
FIGURES & PHOTOPLATES



LEGEND:

GeB	Gee silt loam, 0 to 8 percent slopes. Not hydric.
GeD	Gee silt loam, 8 to 20 percent slopes. Not hydric.
GeE	Gee silt loam, 20 to 30 percent slopes. Not hydric.
HcD	Hesson clay loam, 8 to 20 percent slopes. Not hydric.
HoB	Hillsboro silt loam, 3 to 8 percent slopes. Not hydric.
HoC	Hillsboro silt loam, 8 to 15 percent slopes. Not hydric.
HoD	Hillsboro silt loam, 15 to 20 percent slopes. Not hydric.
HoG	Hillsboro silt loam, 30 to 65 percent slops. Not hydric.
OdB	Odne silt loam, 0 to 5 percent slopes. **Hydric.**
WaA	Washougal loam, 0 to 3 percent slopes. Not hydric.

NOTE(S):

1. Map provided online by NRCS at web address: *http://websoilsurvey.nrcs.usda.gov/app/*

Figure 1
NRCS SOIL SURVEY MAP
Faust Permitting
Alisa Faust
City of La Center, Clark County, Washington
Section 33, Township 5N, Range 1E, W.M.

DATE: 9/10/19
DWN: EF
REQ. BY: JM
PRJ. MGR: KTW
CHK: KTW
PROJECT NO: 3007.01

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Ecological Land Services

0 200 400
SCALE IN FEET

N W E S

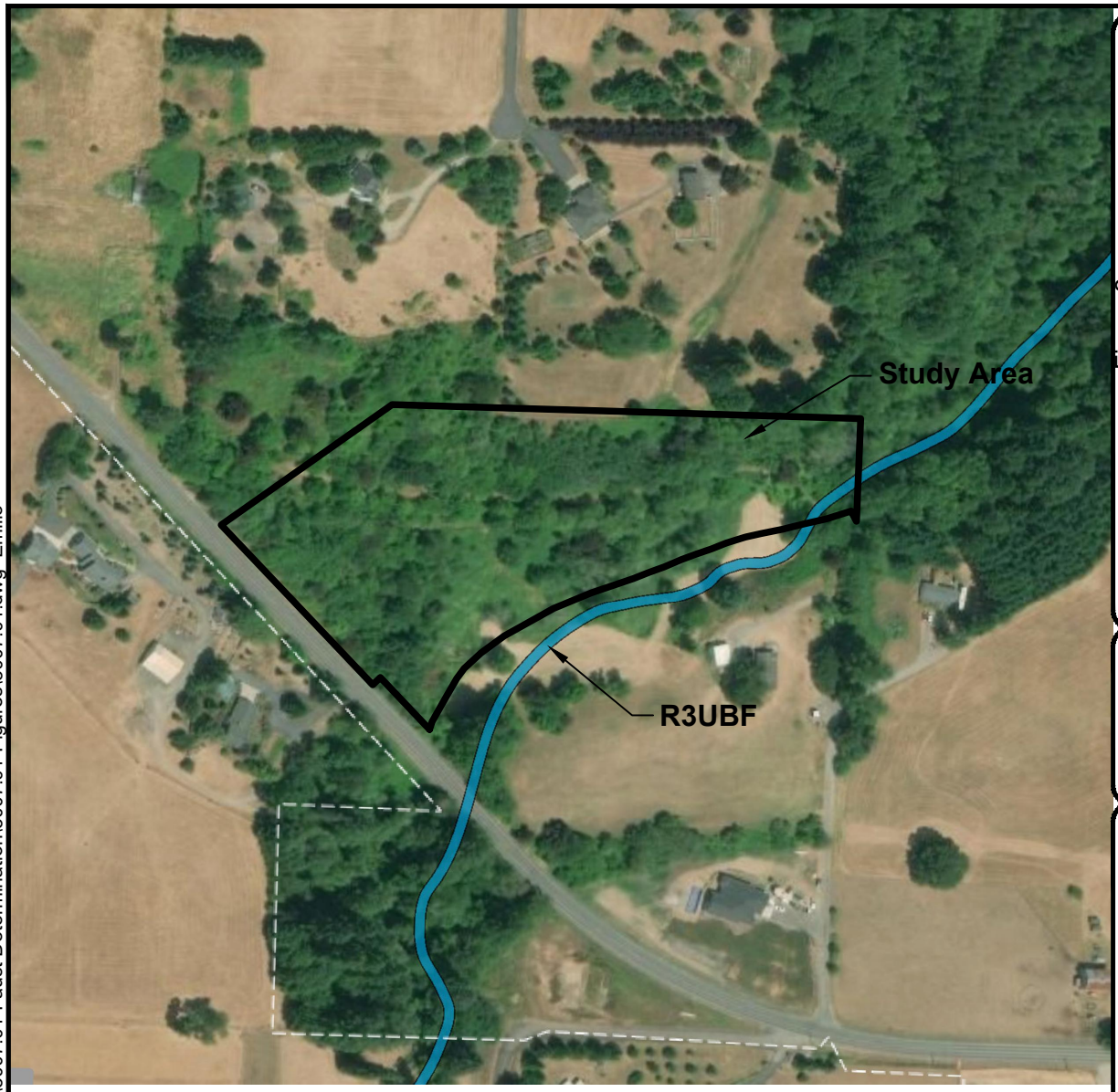

Figure 2
NATIONAL WETLANDS INVENTORY MAP
Faust Permitting
Alisa Faust
City of La Center, Clark County, Washington
Section 33, Township 5N, Range 1E, W.M.

DATE: 9/10/19
DWN: EF
REQ. BY: JM
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Mapped wetlands indicated onsite by US Fish & Wildlife Service.

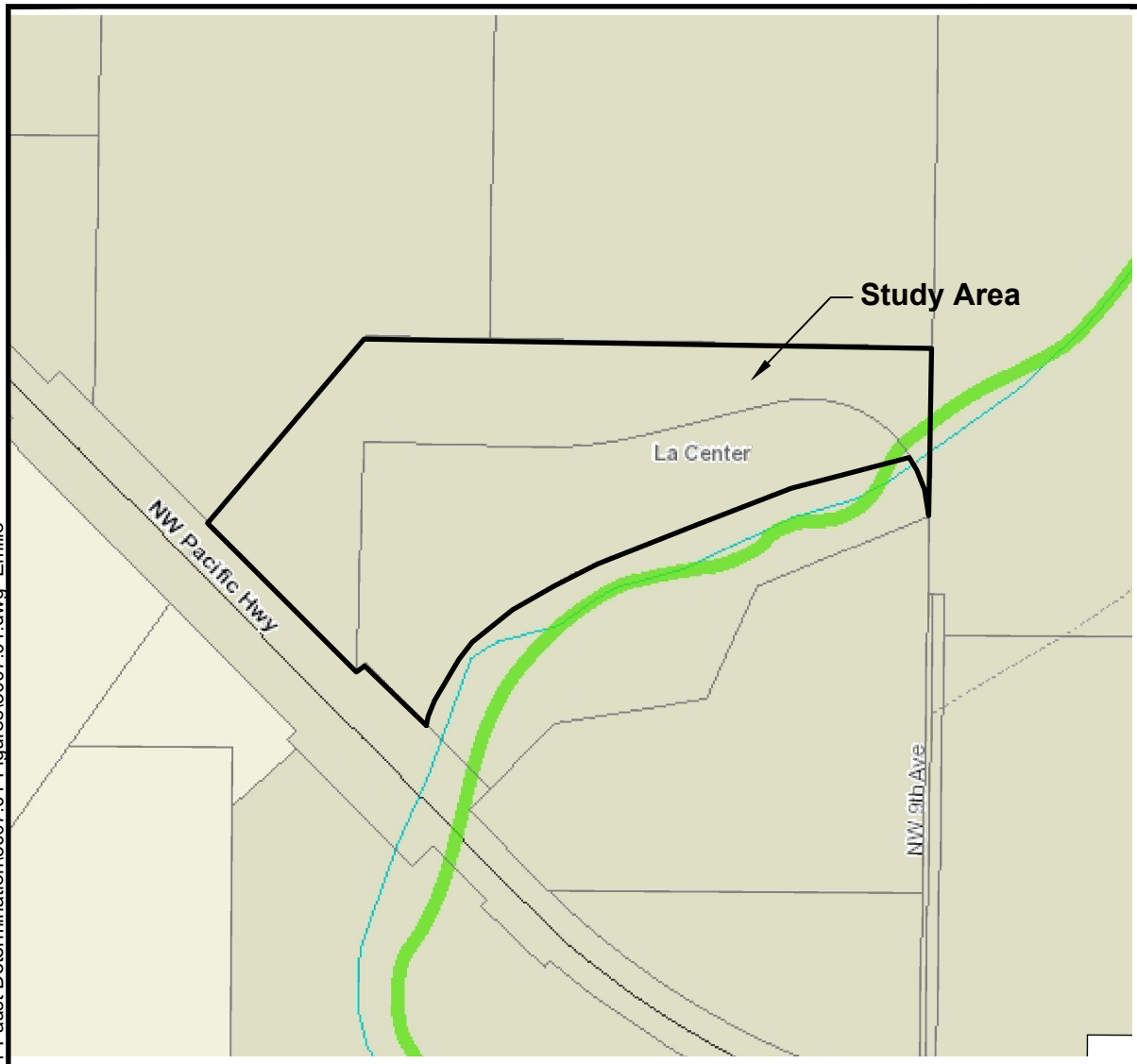
LEGEND:

Riverine

R3UBF Riverine, Upper Perennial, Unconsolidated Bottom, Semipermanently Flooded.

NOTE(S):

1. Map provided online by US Fish & Wildlife Service at web address: *http://www.fws.gov/wetlands/data/index.html*



Clark County Soils and Wetlands Inventory

LEGEND:

County Wetland Inventory

NOTE: Map provided online by Clark County, Washington at web address: *http://gis.clark.wa.gov/imf/imf.jsp?site=zoning*

Figure 3
CLARK COUNTY WETLANDS MAP
Faust Permitting
Alisa Faust
City of La Center, Clark County, Washington
Section 33, Township 5N, Range 1E, W.M.

DATE: 9/10/19
DWN: EF
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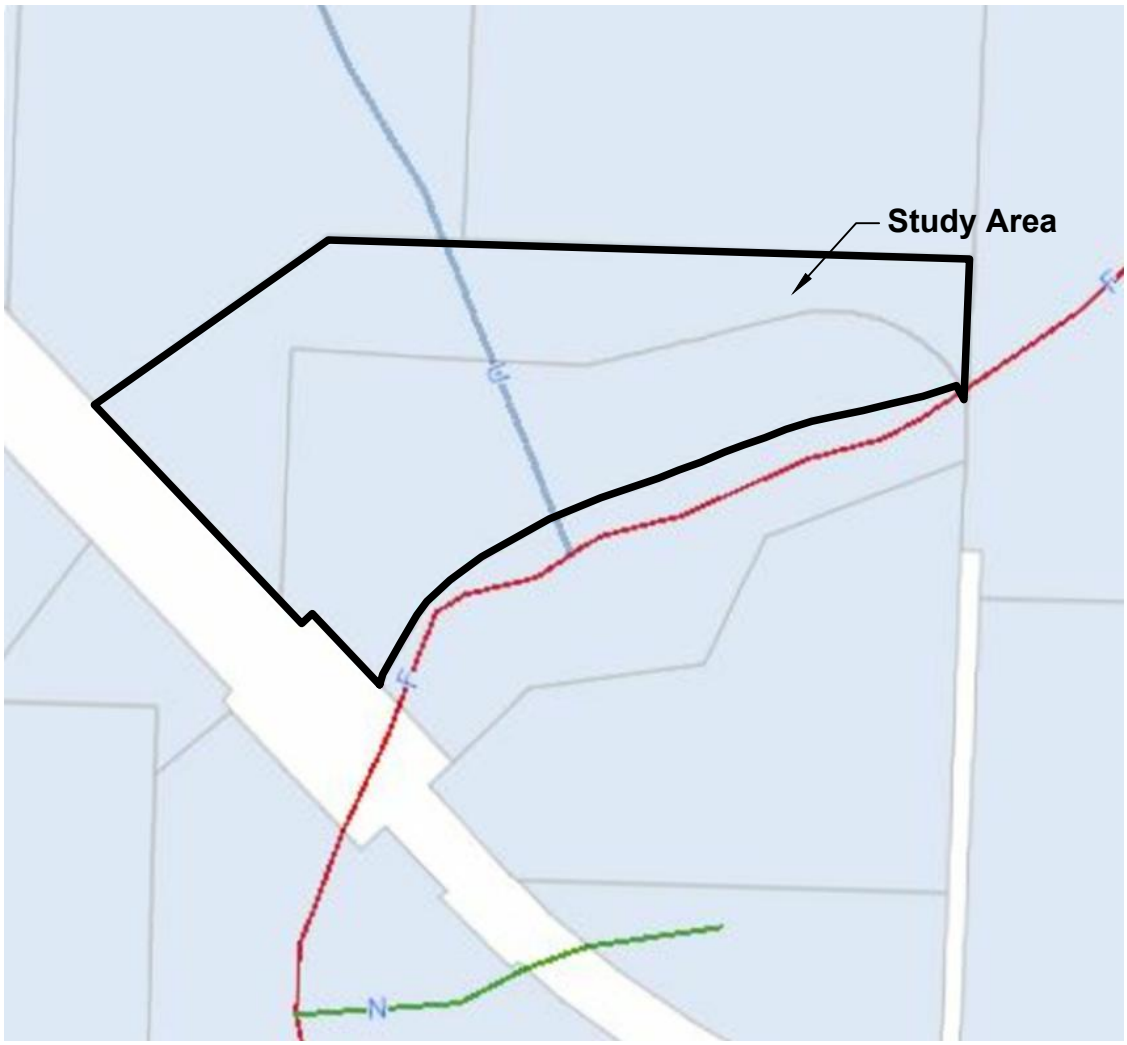

Mapped streams indicated onsite by the Washington State Department of Natural Resources (DNR).

LEGEND:

Streams

Streams

- Type S
- Type F
- Type N, Np, Ns
- U, unknown
- X, non-typed per WAC 222-16

NOTE: Map provided online by Washington State Department of Natural Resources at web address: *https://fortress.wa.gov/dnr/protectiongis/fpamt/index.html*

Figure 4
DNR STREAM TYPE MAP
Faust Permitting
Alisa Faust
City of La Center, Clark County, Washington
Section 33, Township 5N, Range 1E, W.M.

DATE: 9/10/19
DWN: EF
REQ. BY: JM
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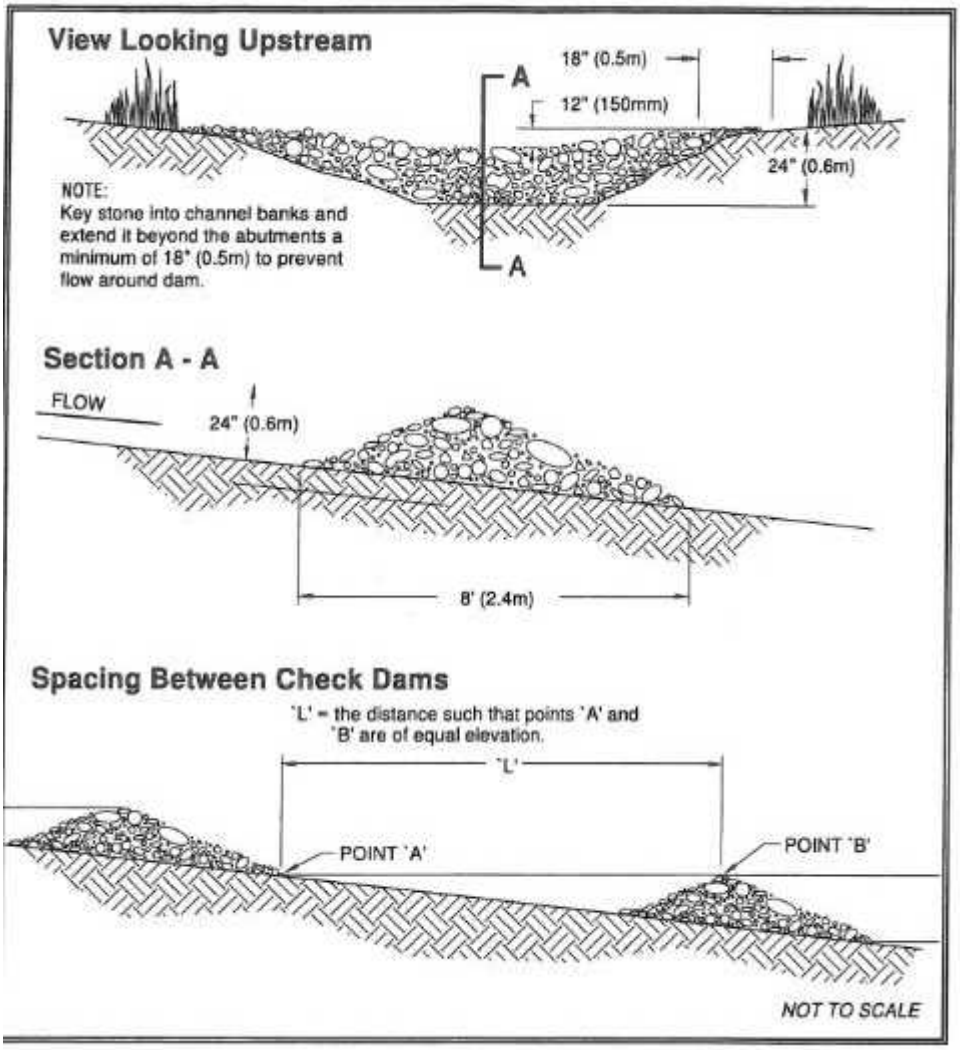
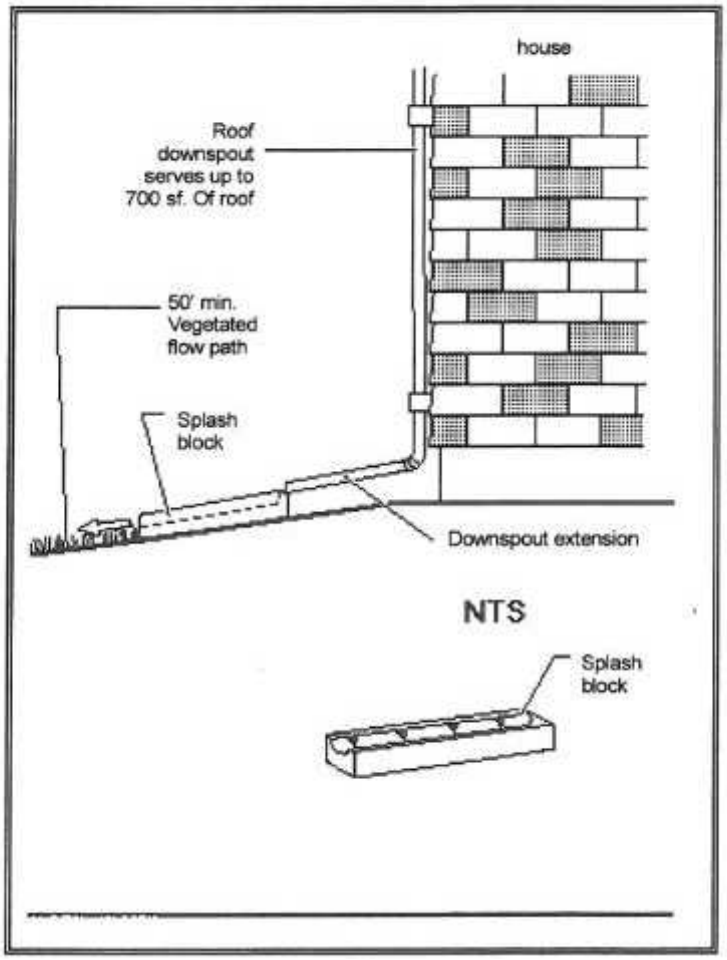


Ecological Land Services	1157 3rd Ave., Suite 220A Longview, WA 98632 Phone: (360) 578-1371 Fax: (360) 414-9305	DATE: 10/9/19 DWN: JM PRJ. MGR: JM PROJ.#: 3007.01	Figure 5 Check Dam Installation Specifications



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PROJ.#: 3007.01

Figure 6
Downspout Splashblock Dispersion Example

Photo 1 was taken along the eastern property boundary facing north. The property boundary is indicated by the pink flagging tape. This photo was taken to illustrate the prevalence of upland vegetation onsite, namely western swordfern (*Polystichum munitum*) and Douglas-fir (*Pseudotsuga menziesii*).

Photo 2 was taken in the central portion of the study area facing north and depicts the channel of Stream 1. The red arrow denotes the Stream 1 with flow direction.

Photo 3 was taken in the central portion of the study area facing south.

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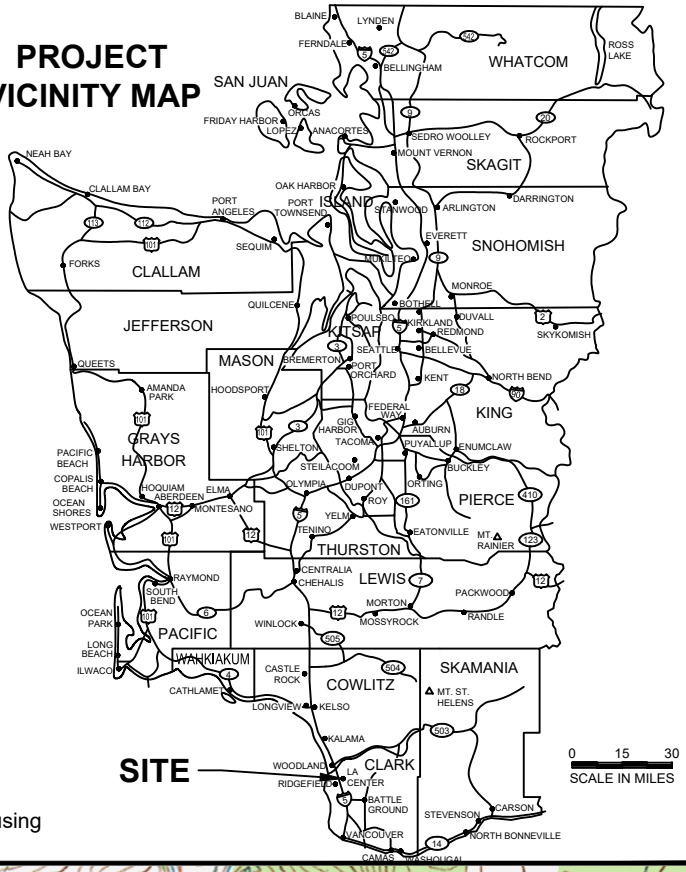
DATE: 8/28/19
DWN: JM
PRJ. MGR: JM
PROJ.#: 3007.01

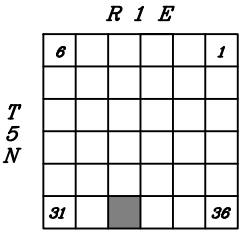
Photoplate 1
Site Photos
Critical Areas Report
Alisa Faust
La Center, Washington

Latitude: 45.8680
Longitude: -122.6791

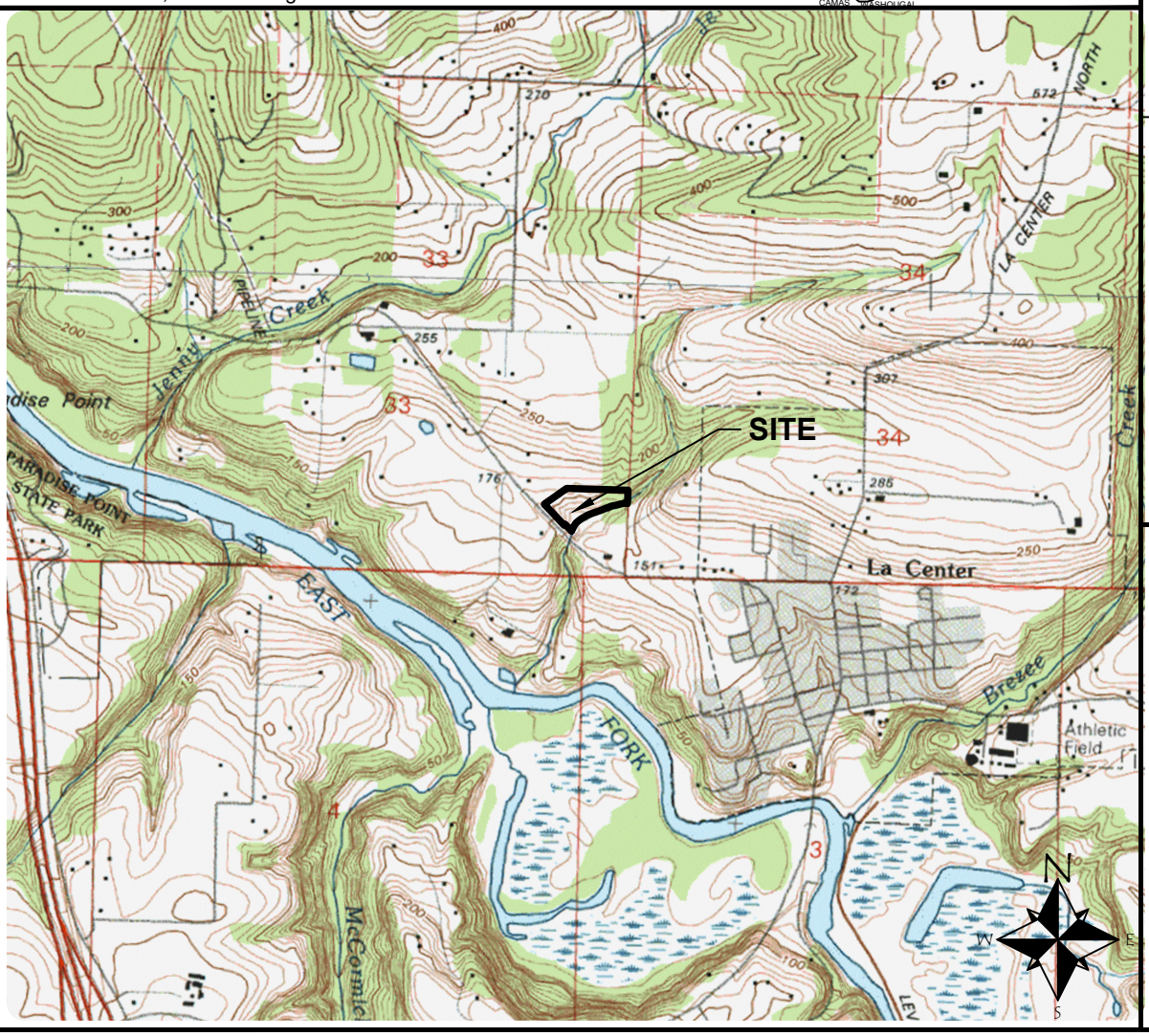
LOCATION MAP

PROJECT VICINITY MAP





NOTE:
USGS topographic quadrangle map reproduced using MAPTECH Inc., Terrain Navigator Pro software.



PROPOSED: RHA Impact
IN Stream
NEAR: La Center **STATE:** WA
COUNTY: Clark
SHEET 1 **OF** 4
DATE: 10/14/19

VICINITY MAP
APPLICANT: Alisa Faust
PROJECT NAME: Faust Permitting
REFERENCE #: Not Yet Assigned
SITE LOCATION ADDRESS: 34100 NW Pacific Hwy La Center

PURPOSE: Residential Development
DATUM: NAD83
ADJACENT PROPERTY OWNERS:

SCALE IN FEET
0 2000 4000

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Longview, WA 98632
Phone: (360) 578-1371

Ecological Land Services

LEGEND:

- Site Boundary
- Parcel Boundaries
- Stream with Flow Direction
- OHWM of Stream
- Stream Buffer

NOTE(S):

1. Parcels from Clark County GIS Department (June 2018).
2. Streams were mapped by an ELS Biologist using a hand-held GPS unit with submeter accuracy and aerial imagery from DNR, Google™.

N W E S

0 100 200 SCALE IN FEET

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Longview, WA 98632
Phone: (360) 578-1371

Ecological Land Services

EXISTING CONDITIONS SITE MAP

APPLICANT: Alisa Faust
PROJECT NAME: Faust Permitting
REFERENCE #: Not Yet Assigned
SITE LOCATION ADDRESS: 34100 NW Pacific Hwy La Center

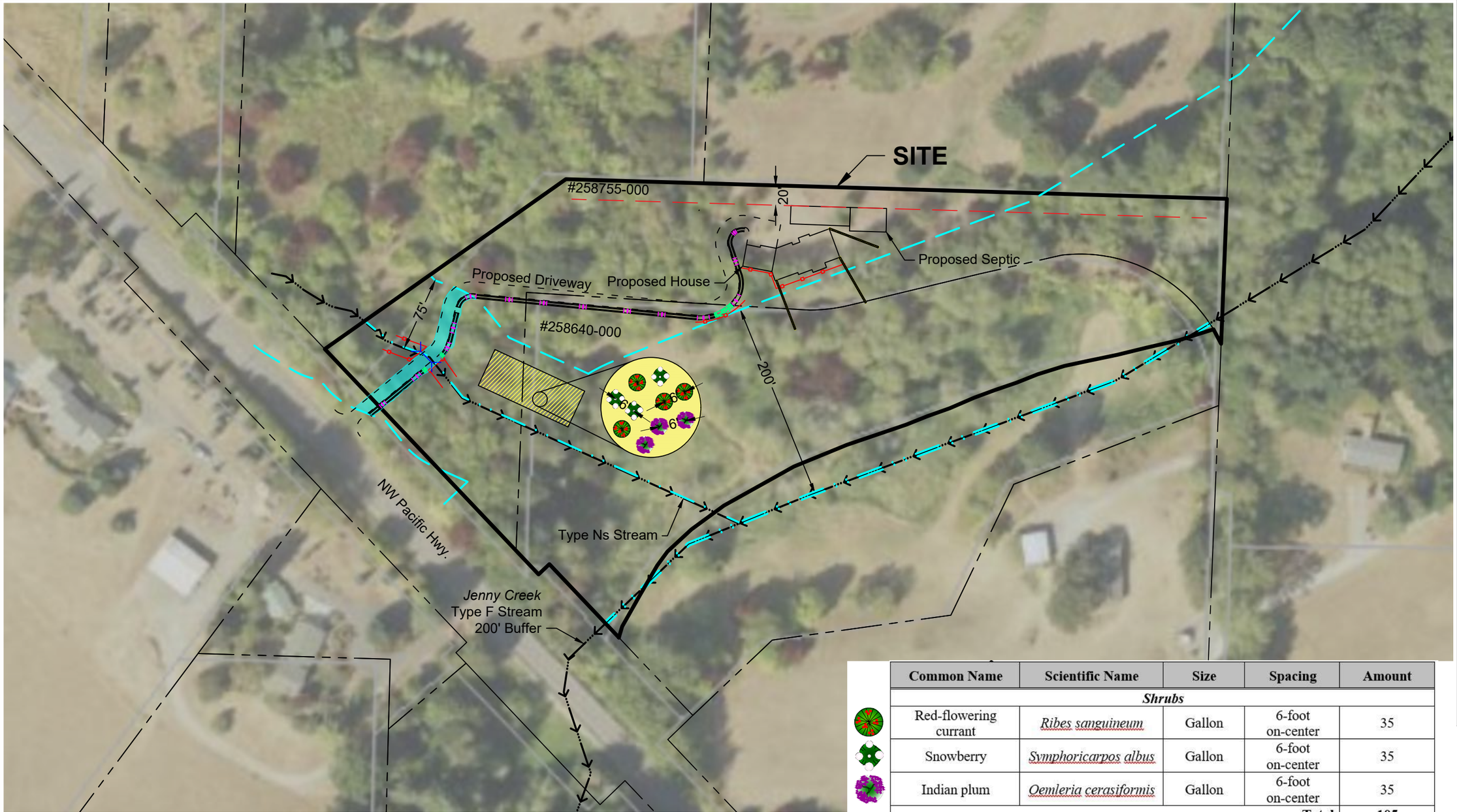
PURPOSE: Residential Development

DATUM: NAD83

ADJACENT PROPERTY OWNERS:

PROPOSED: RHA Impact

IN Stream
NEAR: La Center **STATE:** WA
COUNTY: Clark
SHEET 2 **OF** 4
DATE: 10/14/19



Common Name	Scientific Name	Size	Spacing	Amount
	Shrubs			
Red-flowering currant	*Ribes sanguineum*	Gallon	6-foot on-center	35
Snowberry	*Symphoricarpos albus*	Gallon	6-foot on-center	35
Indian plum	*Oemleria cerasiformis*	Gallon	6-foot on-center	35
			Total	**105**

LEGEND:

- Site Boundary
- Parcel Boundaries
- Stream with Flow Direction
- OHWM
- RHA Buffer
- Proposed Driveway

LEGEND:

- Lot Set Back 20'
- Silt Fencing
- Grass-lined Check Dam Trench
- Check Dam
- Rip-Rap Check Dam Ditch Outfall

LEGEND:

- RHA Buffer Impacts (3,037 sq. ft.)
- Riparian Enhancement Area (4,000 sq. ft.)
- Proposed Bottomless Arch Culvert
- Splash Block with 50' Minimum Vegetated Flow Path

NOTE(S):

1. Parcels from Clark County GIS Department (June 2018).
2. Check dam locations are approximate.
3. Streams were mapped by an ELS Biologist using a hand-held GPS unit with submeter accuracy and aerial imagery from DNR, Google™.

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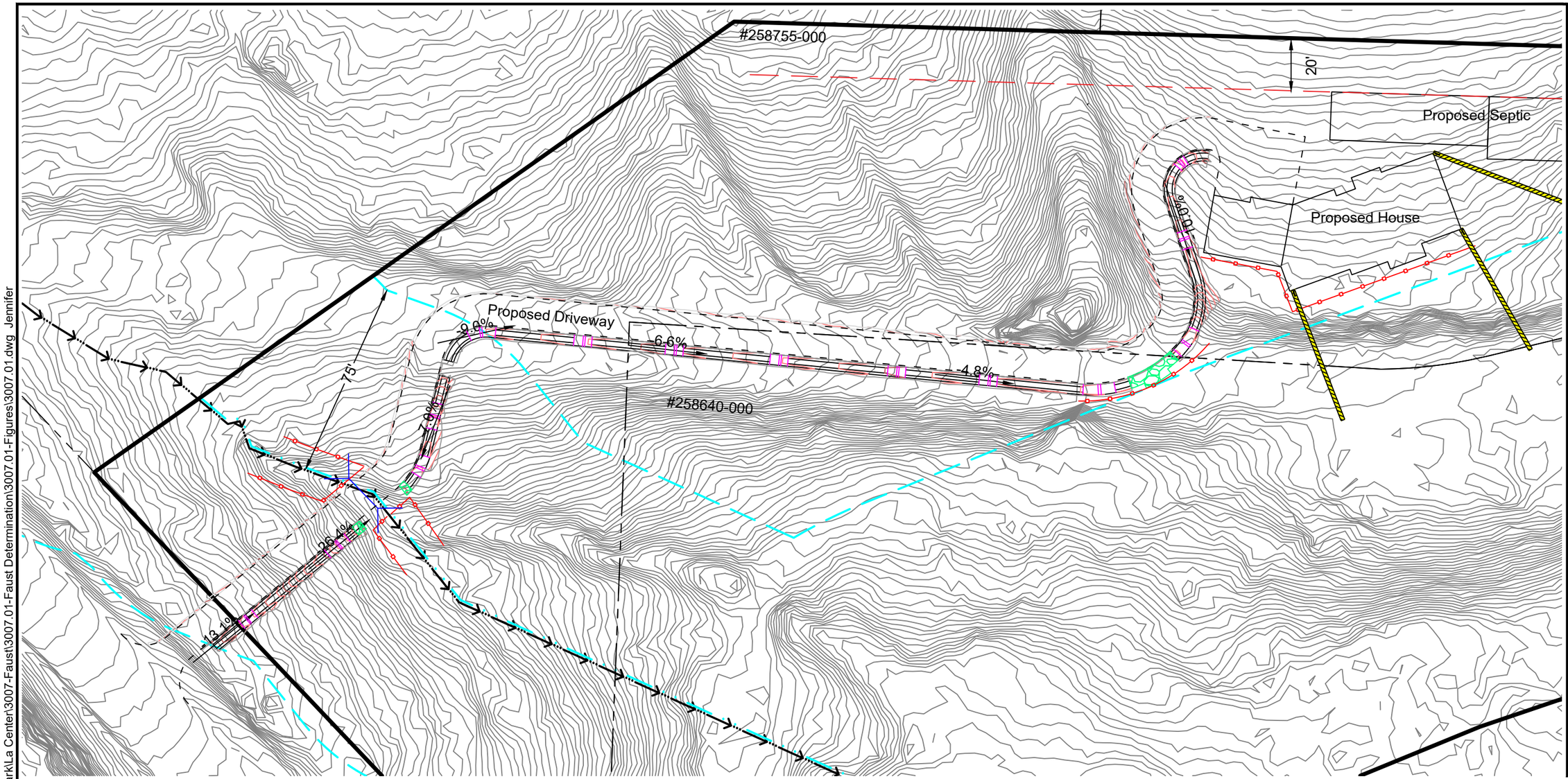
Phone: (360) 578-1371
Ecological Land Services

PROPOSED CONDITIONS SITE MAP

APPLICANT: Alisa Faust
PROJECT NAME: Faust Permitting
REFERENCE #: Not Yet Assigned
SITE LOCATION ADDRESS: 34100 NW Pacific Hwy La Center

PURPOSE: Residential Development
DATUM: NAD83
ADJACENT PROPERTY OWNERS:

PROPOSED: RHA Impact
IN Stream
NEAR: La Center
COUNTY: Clark **STATE:** WA
SHEET 3 **OF** 4
DATE: 10/14/19



PROPOSED: RHA Impact

IN Stream
NEAR: La Center **STATE:** WA
COUNTY: Clark
SHEET 4 **OF** 4
DATE: 10/14/19

PRELIMINARY GRADING PLAN

APPLICANT: Alisa Faust
PROJECT NAME: Faust Permitting
REFERENCE #: Not Yet Assigned
SITE LOCATION ADDRESS:
34100 NW Pacific Hwy La Center

PURPOSE:
Residential Development

DATUM: NAD83
ADJACENT PROPERTY OWNERS:

LEGEND:

- Study Area
- Parcel Boundaries
- Stream with Flow Direction
- OHWM
- RHA Buffer
- Proposed Driveway
- Lot Set Back 20'
- Silt Fencing
- Grass-lined Check Dam Trench

LEGEND:

- Check Dam
- Rip-Rap Check Dam Ditch Outfall
- Proposed Bottomless Arch Culvert
- Splash Block with 50' Minimum Vegetated Flow Path
- Proposed Driveway Grading

NOTE(S):

1. Parcels from Clark County GIS Department (June 2018).
2. Check dam locations are approximate.
3. Streams were mapped by an ELS Biologist using a hand-held GPS unit with submeter accuracy and aerial imagery from DNR, Google™.
4. Existing topography from OCM Partners, 2019: 2016 USGS Lidar: West Washington, https://inport.nmfs.noaa.gov/inport/item/51853.

N W E S

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Longview, WA 98632
Phone: (360) 578-1371

Ecological Land Services