FLOODPLAIN HABITAT ASSESSMENT REPORT

THE RESERVE AT WOODINVILLE
WOODINVILLE, WASHINGTON

Prepared For:

PANATTONI DEVELOPMENT COMPANY, INC.
Woodinville, Washington

Prepared By:

TALASAEA CONSULTANTS, INC.
Woodinville, Washington

15 January 2016

Floodplain Habitat Assessment Report

The Reserve at Woodinville
Woodinville, Washington

Prepared For:

Panattoni Development Company, Inc.
900 SW 16th Street, Suite 330
Renton, WA 98057

Prepared By:

Talasaea Consultants, Inc.
15020 Bear Creek Road NE
Woodinville, Washington 98077
425-861-7550

15 January 2016

EXECUTIVE SUMMARY

REPORT TYPE:	Floodplain Habitat Assessment Report
REPORT NAME:	The Reserve at Woodinville
SITE LOCATION:	The Reserve at Woodinville property is an approximately 12.4-acre assemblage of three parcels, located at 15900 Woodinville-Redmond Road, Woodinville, Washington. The Public Land Survey System location of the property is the NW ¼ of Section 15, T26N, R5E, Willamette Meridian. It is bounded on the east side by the Sammamish River and on the west side by the Woodinville-Redmond Road (SR-202). The King County Tax Parcel numbers for the site are 152605953, 1526059060, and 1526059068.
PROJECT STAFF:	Bill Shiels, Principal; Ann Olsen, Senior Project Manager; David R. Teesdale, PWS, Senior Wetland Ecologist;, Alicia Schulz, Landscape Designer.
CLIENT:	Panattoni Development Company
FIELD SURVEY:	Field work conducted on 20 May and 11 August 2011.

DETERMINATION: The Sammamish River flows north along the eastern property boundary of the site. The Sammamish River within the Woodinville City limits is confined by levees. The Sammamish River is classified by the City of Woodinville as a Type 1 Stream. According to the Woodinville Municipal Code (WMC) Chapter 21.24.380, Type 1 streams require a standard buffer width of 150 feet, measured from the ordinary high water mark (OHWM).

EXISTING SITE CONDITIONS: The Site is the former location of a wholesale lumber and lumber prefabrication facility (Woodinville Lumber), which catered to residential and commercial property developments. Woodinville Lumber is no longer in business and the property is currently vacant (all existing buildings and have been removed). Approximately 89-percent of the site is impervious surfaces. The edge of impervious surface extends into the buffer. The vegetated buffer width, measured from the ordinary high water mark of the Sammamish River, varies from as little as 32 feet to a maximum of 87 feet. Stormwater is collected on site and either discharged directly into the river, or allowed to flow through a bioswale prior to discharge into the river. No detention of stormwater is provided or required for this property.

STREAM BUFFER CONDITION: The on-site portion of the stream buffer is currently vegetated with reed canarygrass and non-native blackberries. Some native trees and shrubs occur in spots along the bank and these include: Douglas fir, western red cedar, red alder, black cottonwood, common snowberry, rose sp., and a few clusters of tall Oregongrape. A 10-foot-wide sanitary sewer easement is located on top of the levee and this area is routinely mowed for maintenance access. An existing biofiltration swale is constructed at the toe of the interior portion of the levee. Runoff from this swale flows north into a ditch at approximately the mid-point of the buffer. This ditch flows east and through a culvert in the levee before discharging directly to the Sammamish River. The outer half of the existing buffer is developed with buildings and parking areas.

FLOODPLAIN: A portion of the 100-year floodplain extends on to the property based on the latest floodplain boundary information as defined in the Letter of Map Amendment (LOMA) issued by FEMA for the project site under Case # 11-10-1973A, dated 10 January 2012. The floodplain boundary defined in the LOMA updates and supersedes the previous 100-year floodplain boundary defined on FEMA's 8 November 1999 FIRM map (map panel # 53033C0360G). This revised boundary defined in the LOMA applies to the project site only, and was based on an evaluation of a detailed topographic survey of the project site using one-foot contour intervals and a base flood elevation of 25.4 feet based on NGVD29 (equivalent elevation at NAVD88 datum = 29.01). The floodplain includes the bioswale mentioned earlier and a drainage ditch that extends westward into the developed portion of the property.

USAGE OF SAMMAMISH RIVER BY T&E SPECIES: The StreamNet and SalmonScape databases identify the following Federally- and State-listed threatened or endangered species as utilizing the reach of the Sammamish River the Action Area for this project (within ½ mile of the Site). These species are identified on **Table 1** below.

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Table 1. Threatened or Endangered Species Presence - Sammamish River

Species	Usage Designation and Source	Federal and State Listing
Fall chinook (*Oncorhynchus tshawytscha*)	StreamNet – Spawning and Rearing SalmonScape – Documented Spawning	Federal – Threatened State - Candidate
Coho (*Onchorhynchus kisutch*)	StreamNet – Rearing and Migration SalmonScape – Documented Rearing	Federal – Species of Concern State - Candidate
Winter steelhead (*Onchorhynchus mykiss*)	StreamNet – Migration Only SalmonScape – Documented Presence	Federal – Threatened State - Candidate
Sockeye (*Onchorynchus nerka*)	StreamNet – Migration Only SalmonScape – Documented Presence	Federal – None State – None
Bull trout (*Salvelinus confluentus*)	StreamNet – Migration Only SalmonScape – Documented Presence	Federal – Threatened State - Candidate

The Sammamish River within the Action Area of the project does not provide optimum spawning or rearing habitat for these listed species of fish. The river lacks pool-riffle complexes or gravel beds suitable for successful spawning. The river is an important corridor for these species to migrate between the open ocean and tributaries of the Sammamish River where optimum spawning and rearing habitat still exists.

PROPOSED PROJECT: Panattoni Development Company proposes to redevelop the Woodinville Lumber property. The proposed project consists of two speculative warehouse buildings with a combined footprint of about 199,700 square feet (sf) with a future second floor area totaling approximately 30,000 sf. Parking will be developed for approximately 200 cars. Paved areas for parking and access will be located on all sides of the new buildings, and the warehouse portion of the structure will have loading docks on both the east and west sides. Portions of the proposed buildings, along with paved parking and loading areas, will be located within the Urban Conservancy shoreline environment (the outer 100 feet) of the 200-foot shoreline zone. These uses are permitted in the Urban Conservancy shoreline environment per Woodinville's SMP. No development will occur within the Conservancy shoreline environment (the inner, or waterward 100 feet) of the 200-foot shoreline zone.

The site will be fully developed in a single phase including offsite improvement along Woodinville Redmond road (SR-202) and driveway improvement inside a vested access across the King County Park property from the public street. On site work will include grading, storm drainage, connections to existing on site sewer and water lines, building construction and associated site improvements along with connections to offsite wet and dry utilities.

Proposed stormwater management facilities will include several components. An enhanced basic water quality treatment facility with constructed treatment wetland will be located at the southeast corner of the site and will treat runoff from pollutant-generating surfaces (e.g., parking areas). Treated runoff from this facility will be discharged to the Sammamish River via an existing outfall. A media filter strip with plantings will treat and infiltrate direct runoff from parking adjacent to the river buffer. Clean rooftop runoff will be discharged directly to an existing outfall within the Sammamish River buffer.

Two short paths accessing two shoreline viewpoints will be constructed within the stream buffer to provide shoreline access per the requirements of Woodinville's Shoreline Management Plan (SMP).

ASSESSMENT OF DEVELOPMENT IMPACTS: No impacts to the Sammamish River is proposed with the redevelopment proposal. The project is proposing to reduce the standard buffer and there will be temporary impacts to floodplain storage. These are described below.

Stream Buffer Reduction: The project proposes to reduce the on-site portion of the Sammamish River buffer from the 150-foot standard buffer to a reduced 100-foot minimum buffer. WMC §21.24.380(1)(a) allows reduction of the 150-foot standard buffer to a reduced 115-foot buffer with enhancement, and then a further reduction to a minimum 100-foot buffer when a special study, based upon best available science, determines that the functions achieved in 100 feet are equal to the functions achieved in the 115 feet for the site in question. It should be noted that the buffer is already effectively reduced below the 100-foot minimum. Existing development currently encroaches into the outer portion of the 150-foot standard buffer, and the existing vegetated buffer width primarily ranges between approximately 32 and

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87 feet. The project will actually restore existing paved areas to native buffer in order to achieve a consistent 100-foot width.

Floodplain Storage Loss: The project proposes to fill small portions of an existing stormwater discharge ditch and an existing grass-lined swale that are both located within the FEMA 100-year flood zone, also referred to as the flood hazard area. This zone is referenced on the plans as Flood Zone AE. A total of 3,740 cubic feet (cf) of flood storage will be lost.

PROPOSED MITIGATION: Mitigation for the impacts listed above will provide a vastly improved stream buffer condition over the current partially developed and degraded buffer on the Site. A total of 95,720 sf of buffer will be provided with this development proposal. The following mitigation is proposed:

Stream Buffer Re-establishment: The project proposes re-establishing approximately 21,420 sf of existing impervious surface to a functioning stream buffer. The re-establishment of the existing impervious surface area to native vegetated stream buffer will increase the total vegetated stream buffer to a width that is greater than existing conditions.

Stream Buffer Enhancement: To mitigate for reducing the 150-foot stream buffer to 100 feet, the project will enhance 74,300 sf of existing vegetated but degraded buffer.

Critical Area Fencing and Signs: Following construction completion, a split-rail fence (or similar type) will be installed along the entire buffer boundary. Where shoreline viewpoints are located in the buffer, split-rail fencing will also be installed around the viewpoints and associated access paths to deter pedestrian intrusion into the buffer areas.

Per WMC §21.24.160(2): The boundary between a critical area tract and contiguous land shall be identified with permanent signs. Per Section Three of the City of Woodinville *Wetland and Stream Mitigation Guidelines, Part 1 – Design Guidelines, Section 4.0 – Structures, 4.2: "Critical Area Signs shall be mounted on posts set into the ground at 100' intervals or 1 per lot for smaller lots".*

Replace Floodplain Storage: To mitigate for the loss of floodplain volume, the existing grass-lined swale located at the toe of the landward side of the existing levee will be graded deeper and wider to replace the 3,740 cf of floodplain storage lost due to construction impacts. Approximately 5,430 cf of replacement flood storage volume will be provided, which will significantly exceed the minimum needed to compensate for the lost flood storage volume. All re-graded swale areas will be restored with native vegetation. The bottom of the swale will be seeded and stabilized per the engineering plans, and the side slopes of the swale will be planted with native shrubs per the buffer mitigation plans.

PERFORMANCE MONITORING: All of the re-established and enhanced stream buffer areas will be monitored for five years to ensure compliance with the mitigation goals, objectives, and performance standards defined in this report and as approved by the City.

FINANCIAL SURETY: In addition, a performance security will be provided to ensure that the monitoring and maintenance is carried out as specified in the approved mitigation plan for the duration of the monitoring period.

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CHAPTER 1. INTRODUCTION

This report has been written to comply with the standard reporting requirements and document format for a FEMA Habitat Assessment and Mitigation Report. A habitat assessment and mitigation report is necessary for any project occurring within a floodplain that may affect Federally-listed threatened or endangered (T&E) species. The purpose of this report is to describe existing habitat conditions on and adjacent to the floodplain, discuss the usage of the site by T&E species, and provide an analysis of the potential affects to T&E species that may occur due to project actions. The Reserve at Woodinville property (Site) is located in Woodinville, Washington (**Figure 1**). The Site is the location of a proposed redevelopment to construct two buildings with associated parking and infrastructure improvements.

The Site is located adjacent to the Sammamish River, which has known runs of T&E salmonids. A portion of the property is contained within the 100-year floodplain for the Sammamish River, as defined by the base 100-year flood elevation provided by FEMA in the LOMA dated 10 January 2012 (see **Appendix A**). See plan sheets in **Appendix B** for the location of the revised 100-year floodplain boundary as defined in the LOMA.

This document will address the reporting requirements for the proposed project. Source Agencies for these requirements include:

- City of Woodinville;
- Washington Department of Fish and Wildlife;
- National Marine Fisheries Service; and,
- Federal Emergency Management Agency.

CHAPTER 2. GENERAL PROPERTY DESCRIPTION AND LAND USE

2.1 Project Location

The Project Site is an approximately 12.4-acre assemblage of three parcels, located at 15900 Woodinville-Redmond Road, Woodinville, Washington (**Figure 2**). It is bounded on the east side by the Sammamish River and on the west side by Woodinville-Redmond Road (State Route 202). The King County Tax Parcel numbers for the site are 1526059053, 1526059060 and 1526059068. The Public Land Survey System location of the property is the NW ¼ of Section 15, T26N, R5E, Willamette Meridian.

2.2 Existing Site Development

The Site is the former location of a wholesale lumber and lumber prefabrication facility (Woodinville Lumber), which catered to residential and commercial property developments. Woodinville Lumber is no longer in business and the property is currently vacant (all existing buildings and have been removed). Approximately 532,310 sf of the approximately 597,064 sf site is paved with impervious surfaces or buildings (approximately 89%). Stormwater discharges to the river from two pipe outlets located near the property's northeast corner. One pipe (North Discharge Point) is approximately 140 feet southeast of the Site's northeast corner. The pipe discharges to a relatively short ditch, approximately 80 linear feet (lf), before entering the Sammamish River. The second pipe (South Discharge Point) is approximately 290 feet southeast of the Site's northeast property corner. Discharge from this pipe flows in a constructed ditch in an easterly direction for approximately 180 feet before comingling with the River. Both pipe outfalls are within the property boundaries.

Approximately 64,754 sf of the property along the Sammamish River is vegetated with both native trees and shrubs and non-native invasive species including: red alder (*Alnus rubra*), black cottonwood (*Populus balsamifera*), rose (*Rosa spp*.), Himalayan blackberry (*Rubus armeniacus*) and others. Herbaceous vegetation includes reed canarygrass (*Phalaris*

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arundinacea). The remaining portions of the Site are landscaped with typical ornamental landscaping species.

2.3 Adjacent Land Use

Properties to the north and south of the Site consist of commercial businesses. Properties to the west across SR-202 include commercial businesses and two vacant parcels. Vegetation on the portions of the vacant parcels visible from SR-202 includes mixed grasses, areas of reed canarygrass, and dense patches of Himalayan blackberry. A currently unused railroad right-of-way runs between the project site and SR-202. East of the site on the right bank of the Sammamish River is the Sammamish River Trail corridor, a public park which contains the paved multi-use Sammamish River Trail. The properties to the east of the trail consist primarily of farmland.

2.4 Land Use and Zoning

The project site is located directly adjacent to the Sammamish River, a Shoreline of the State, and as such development on the Site must follow the regulations of Woodinville's Shoreline Master Program, in addition to all other applicable codes and development regulations.

CHAPTER 3. REGULATORY REVIEW

3.1 City of Woodinville Municipal Code

The City of Woodinville's Critical Areas Code is contained in Chapter 21.24 of the Woodinville Municipal Code (WMC). This Chapter describes and defines the types of regulated critical areas, the levels of protections provided to these areas, and standards for development in and around these areas.

The Reserve at Woodinville property has only one regulated critical area per WMC 21.24: the Sammamish River, which is listed by the City of Woodinville as a Type 1 Stream and a Water of the State of Washington. The standard buffer for the Sammamish River is 150 feet measured landward from the ordinary high water mark (OHWM), or from the top of bank if the OHWM is not readily discernable. This buffer may be reduced to 115 feet with an approved buffer enhancement plan, provided that the existing buffer is already significantly degraded (WMC §21.24.380 (1)). In addition, WMC §21.24.380(1)(a) states:

> *A 100-foot buffer may be allowed by the Development Services Director when a special study based upon best available science, determines that the functions achieved in 100 feet are equal to the functions achieved in 115 feet for the site in question.*

While buffers for degraded urban streams may be reduced below the specified minimum level, it is not possible to do this with buffers on Type 1 waters such as the Sammamish River (WMC §21.24.380 (1) (A) (b) (i)).

3.2 City of Woodinville Shoreline Regulations

Washington State's Shoreline Management Act (SMA §90.58 RCW, the Shoreline Act of 1971) established a cooperative agreement between the State and local jurisdictions to define frameworks for regulating and defining growth along State shorelines. The purpose was to prevent unregulated and uncoordinated growth from irreparably harming the shoreline environment. Local governments respond to the provisions of the SMA through developing Shoreline Master Programs (SMP). The Washington Department of Ecology works with the local jurisdictions to ensure that each SMP complies with the SMA, and, in turn, will support the implementation of the local SMP. Each jurisdiction's SMP regulates development activities and

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uses within shorelands. By definition, shorelands include all land 200 feet landward from the OHWM of a State shoreline, or the boundary of the 100-year floodplain[1], whichever is greater.

The Reserve at Woodinville property is directly adjacent to the Sammamish River, which is a Shoreline of the State. Thus, all land on the project site within 200 feet of the OHWM of the Sammamish River is defined as shorelands (also referred to herein as the shoreline zone) and all development in this zone is subject to the City of Woodinville's SMP regulations. For any development within the shoreline zone the applicant must obtain a Shoreline Substantial Development Permit (SSDP) from the City of Woodinville, in addition to other applicable permits.

The City of Woodinville's latest SMP was adopted August 2008 and revised December 2009. It defines four shoreline environmental designations, based on location within the 200-foot shoreline zone and sensitivity of the associated shoreline environment. These shoreline environmental designations are: Aquatic, Conservancy, Shoreline Residence, and Urban Conservancy (**Figure 3**). Each shoreline environmental designation has a defined list of allowed uses stemming from the guidelines and requirements contained in the SMA. Chapter 6 of Woodinville's SMP contains a shoreline use matrix (Table 6-1) that defines allowed uses for the four shoreline environmental designations.

Pursuant to the City of Woodinville Shoreline Designation Map, the Reserve at Woodinville property contains both Conservancy and Urban Conservancy shoreline environmental designations. The Conservancy environment consists of the inner (waterward) 100 feet of the 200-foot shoreline zone, and the Urban Conservancy environment consists of the outer (landward) 100 feet of the 200-foot shoreline zone.

Many development activities are allowed in the Urban Conservancy environment. Section 5.2.4 of the SMP states: "The purpose of the Urban Conservancy designation is to protect and restore ecological functions of open space, floodplain and other sensitive lands where they exist in urban and developed settings, while allowing a variety of compatible uses as established by the Comprehensive Plan". Per the shoreline use matrix in Table 6-1 of the SMP, both commercial office space and warehousing are allowed uses in the Urban Conservancy environment on the Reserve at Woodinville property. Uses that are not permitted in the Urban Conservancy environment include:

- Discharge of sewage, waste, rubbish, litter, fluid, or other possible toxic substances;
- Disposal of fuels, cleansers, lubricants, hydraulic fluids, or other possible toxic substances;
- Commercial parking lots;
- Off-premise commercial signs;
- Over-water residential development;
- Transfer sites/stations;
- Sewage/waste treatment;
- New pumping stations;
- Natural gas storage;
- Junk and salvage yards;
- Staging or storage yards;
- Solid waste disposal; and,

[1] A floodplain (based on 44 CFR Ch.1 §59.1) means any land area susceptible to being inundated by water from any source. Floodway, or regulatory floodway, means the channel of a river or other water course and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height (i.e., development will not increase upstream flooding).

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- Other non-recreational water-related uses.

Some uses are allowed in the Urban Conservancy shoreline environment under certain conditions. These include parking and loading areas attached to a permitted-use business. However, parking within a shoreline management area is only typically allowed landward of buildings. This is to minimize visual impacts of parking lots upon shorelines and recreational areas (SMP §6.11.2.5.b). A Shoreline Conditional Use Permit (CUP) is required for parking or loading areas to be allowed waterward of buildings in a shoreline management area.

In general, development is prohibited in the Conservancy shoreline environment. Per Section 5.2.2 of the SMP, the purpose of the Conservancy shoreline environment is to "protect and restore ecological functions, while making the areas available for limited human use, when appropriate and non-destructive of critical areas…Allowed uses should meet the Shoreline Management Act guideline (WAC 173-26-211(2)(a)) of being non-consumptive of the physical and biological resources of the area".

3.3 Floodplain Regulations

WMC 21.24.210 through 260 specifies the regulations governing development within "flood hazard areas". Flood hazard areas are areas determined to be within a zone "for a flood having a one percent chance of being equaled or exceeded in any given year, often referred to as the '100 year flood' " (WMC 21.24.210(2). Flood hazard areas include the following components per WMC 21.24.210(1):

1. Floodplain
2. Flood fringe
3. Zero-rise floodway
4. FEMA floodway

For the purposes of officially defining the 100-year special flood hazard areas, the City of Woodinville has adopted the boundaries as defined in the scientific and engineering report prepared by FEMA entitled "Flood Insurance Study for King County" dated 8 November 1999, with accompanying Flood Insurance Rate Maps (FIRMs). The map that contains the project site is FIRM map panel no. 53033C0360G.

The flood hazard area (100-year flood zone) on the project site as previously depicted on FIRM map panel no. 53033C0360G has been amended as outlined in the Letter of Map Amendment (LOMA) dated 10 January 2012, issued by FEMA under case no. 11-10-1973A (the 100-year flood zone is referred to as the Special Flood Hazard Area (SFHA) in the LOMA). A copy of this letter is included in **Appendix A**. The revised SFHA/100-year floodplain has been substantially reduced vs. the existing boundary depicted on the FIRM map. This was based on a detailed topographic survey of the project site, which allowed for more accurate, site-specific mapping of the base flood elevation on the site.

The proposed development does not propose any new buildings within the updated SFHA/100-year floodplain. However, a portion of the proposed parking area will impact and fill a small portion of the 100-year floodplain. WMC 21.24.230 states that "development shall not reduce the effective base flood storage volume of the floodplain". Therefore, compensatory flood volume storage is required for the proposed project for this impact.

For any project that proposes development in the FEMA-regulated floodplain, a habitat assessment report must be prepared to assess potential development impacts on Federally-listed threatened or endangered species or habitats of primary association with such species. FEMA developed its Habitat Assessment and Mitigation Draft Regional Guidance document for use by communities in the Puget Sound Basin to provide a framework of reporting requirements for the preparation of floodplain habitat assessment reports in order to ensure project

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compliance with the requirements of the Endangered Species Act. The requirements were clarified in the Biological Opinion issued by the National Marine Fisheries Service (NMFS) on 22 September 2008.

CHAPTER 4. ACTION AREA

The Action Area for the Habitat Management portion of this report includes the Site plus a ½ mile radius around the Site (**Figure 4**). This Action Area contains land that is used for light industrial and commercial purposes, multi-family residential developments, and active agricultural lands.

CHAPTER 5. METHODOLOGY

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

1) Wetland and soils information from resource agencies;
2) Critical Areas information from the City of Woodinville and King County, Washington,
3) Anadromous fish presence information from:
    a. StreamNet database
    b. SalmonScape database
4) Ortho-photography and LIDAR imagery; and,
5) Relevant studies completed or ongoing in the vicinity of the Site.

The second part consisted of site investigations where direct observations and measurements of existing environmental conditions were made. Observations included plant communities, soils, signs of wetland hydrology, and determination of the ordinary high water mark along the left bank of the Sammamish River.

Background information reviewed prior to field investigations included:

- U.S. Fish and Wildlife Service Wetlands Online Mapper (http://wetlandsfws.er.usgs.gov/wtlnds/launch.html):
- Natural Resources conservation Service, Web Soil Survey (http://websoilsurvey.nrcs.usda.gov/app/);
- Natural Resources Conservation Service, National Hydric Soils List by State (http://soils.usda.gov/use/hydric/list/state.html);
- King County GIS database (King County, 2006);
- StreamNet database, 2014 (www.streamnet.org);
- SalmonScape database, 2014 (www.wdfw.wa.gov/mapping/salmonscape/databases);
- WDFW Priority Habitats and Species (PHS) Database on the Web (Washington State Department of Fish and Wildlife 2014) (http://wdfw.wa.gov/mapping/phs/);
- Washington Department of Natural Resources (WDNR) Natural Heritage Database;
- WDOE Washington State's Water Quality Assessment and 303(d) List (http://www.ecy.wa.gov/programs/wq/303d/currentassessmt.html); and

Orthophotography from USDA's National Agricultural Imagery Program (NAIP 2009), EarthExplorer (USGS), and Google Earth.

Talasaea consultants evaluated site conditions on 20 May 2011 and delineated the ordinary high water mark on 11 August 2011. The site evaluation consisted of a visual observation of existing conditions to identify the general location of critical areas and habitats. These critical areas and habitats included wetlands and streams. Ordinary high water mark for the

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Sammamish River was determined by examining the banks for signs of soil erosion or soil deposition patterns, wrack, matted vegetation, and patterns of vegetation. The approximate location of OHWM was marked in the field with numbered lathe.

CHAPTER 6. EXISTING CONDITIONS

6.1 National Wetlands Inventory

We reviewed the National Wetlands Inventory (NWI) maps for the Kirkland and Bothell Quadrangles (**Figure 5**). The Site is located near the north boundary of the Kirkland Quadrangle, which necessitated a review of the Bothell Quadrangle as well.

The NWI does not map any wetlands on the Site. It does, however, map the Sammamish River adjacent to the Site. The NWI identifies the Sammamish River as a lower perennial riverine system with an unconsolidated bottom (R2UBH).

The NWI maps several wetlands within the Action Area of the Site. These wetlands are all east of the Site in the vicinity of the right bank of the Sammamish River. These wetlands include palustrine emergent wetlands that are seasonally flooded and partially drained or ditched (PEMCd), palustrine emergent wetlands that are temporarily flooded and partially drained or ditched (PEMAd), and a palustrine scrub-shrub wetland that is seasonally flooded (PSSC).

6.2 Natural Resources Conservation Service

The Natural Resources Conservation Service (NRSC) identifies one soil type on the Site. This soil is Earlmont silt loam. Earlmont silt loam is made up of somewhat poorly drained soils that formed in diatomaceous materials located in floodplains. The surface layer is a dark grayish-brown silt loam about nine inches thick. The subsoil is typically grayish brown to brown silt loam and silty clay loam about 35 inches thick. The substratum is stratified very fine sandy loam, muck, and diatomite to a depth of approximately 60 inches. Earlmont silt loam is listed as a hydric soil by the National Technical Committee on Hydric Soils.

6.3 King County GIS Database

The King County GIS database contains information on wetlands and streams (**Figure 6**). No wetlands or streams are mapped on the Site by King County.

6.3.1 King County SAO Wetlands

King County does not indicate any wetlands on the Site (**Figure 6**). There are two wetlands within the Action Area. One wetland is mapped approximately 260 feet south of the Site. It is unlikely that this wetland exists because the area of the mapped wetland is shown to be a commercial-industrial property with five buildings and paved parking. The second wetland is approximately 1,200 feet northwest of the Site on properties that are mostly agricultural fields. There appear to be some buildings within the mapped wetland adjacent to 140th Place NE. A large wetland is mapped to the south of the Site. However, this site has been developed as light industrial and is mostly covered with impervious surfaces. It is highly unlikely that this wetland, if it had existed in the past, still exists today.

6.3.2 King County GIS Streams

The Site is adjacent to the left bank of the Sammamish River. King County does not indicate any other streams on the Site (**Figure 6**). There are several drainages within the Action Area. Most of these drainages appear to be drainage ditches for the agricultural fields on the east side of the Sammamish River. Two drainages flow to the Sammamish River on the west side. One of the drainages is approximately 900 feet to the north. The other drainage is approximately 1,025 feet to the south. Two other drainages are mapped on the western edge of the Action Area, but do not extend past the Burlington Northern rail road located west of Woodinville-Redmond Road.

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Several drainages are indicated flowing to the Sammamish River along the right bank. Two of these drainages are named streams: Woodin Creek to the north and Gold Creek to the south. The remaining drainages appear to be ditches excavated for draining agricultural land. None of these streams or drainages along the right bank of the Sammamish River will be affected by development on the Site.

6.4 Resource Agency Fish Presence Databases

The StreamNet and SalmonScape databases identify the following salmonids utilizing the reach of the Sammamish River adjacent to the Site.

Table 2. Threatened or Endangered Species Presence - Sammamish River

Species	Usage Designated	Federal-State Listing
Fall Chinook (*Oncorhynchus tshawytscha*)	StreamNet – Spawning and Rearing SalmonScape – Documented Spawning	Federal – Threatened State – Candidate
Coho (*Oncorhynchus kisutch*)	StreamNet – Rearing and Migration SalmonScape – Documented Rearing	Federal – Species of Concern State – Candidate
Winter steelhead (*Oncorhynchus mykiss*)	StreamNet – Migration only SalmonScape – Documented Presence	Federal – Threatened State – Candidate
Sockeye (*Oncorhynchus nerka*)	StreamNet – Migration only SalmonScape – Documented Presence	Federal – None State – None
Bull trout (*Salvelinus confluentus*)	StreamNet – Migration only SalmonScape – Documented Presence	Federal – Threatened State – Candidate

There are no indications by either resource agency that any of the salmonid species listed above utilize any portion of the Site other than the Sammamish River.

6.5 Washington Department of Natural Resources Natural Heritage Database

The Washington Department of Natural Resources does not indicate any natural heritage species or habitats on or within the Action Area of the Site.

6.6 Reserve at Woodinville Property

We conducted an evaluation of the Site on 20 May 2011 at which time we delineated the ordinary high water mark (OHWM) of the Sammamish River and looked for the presence of wetlands. The OHWM of the Sammamish River is shown on **Sheet W1.0** in **Appendix B**.

The Sammamish River flows north along the eastern property boundary of the site. The Sammamish River within the Woodinville City limits is confined by levees. The slope of the left bank of the Sammamish River adjacent to the Site ranges between approximately 32% to approximately 60%. The levee, itself, appears to be stable with no signs of erosion or other damage. The Army Corps of Engineers is responsible for the maintenance of bank armoring the levees.

Stormwater discharges to the river from two pipe outlets located near the property's northeast corner. One pipe (North Discharge Point) is approximately 140 feet southeast of the Site's northeast corner. The pipe discharges to a relatively short ditch (approximately 80 lf) before entering the Sammamish River. The second pipe (South Discharge Point) is approximately 290 feet southeast of the Site's northeast property corner. Discharge from the pipe flows in a constructed ditch in an easterly direction for approximately 180 feet before commingling with the River. Both pipe outfalls are within the property boundaries.

We found no evidence of wetlands on the Site. The Site has been completely paved and developed, with the exception of a stormwater swale adjacent to the Sammamish River on the property's eastern boundary and the stormwater discharge locations previously described.

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CHAPTER 7. OCCURENCES OF FEDERALLY-LISTED SPECIES

The USFWS and NMFS websites show Federally-listed and proposed endangered and threatened species occurring within the action area for the Site. WDFW maintains a list of Priority Habitats and Species. SalmonScape (WDFW) and StreamNet.org both maintain interactive mappers that show stream usage by various listed threatened or endangered species in Washington State (as well as adjacent states). Species potentially present within the ¼ mile action area include Puget Sound chinook, coho, steelhead, and bull trout. Species list and status by state and Federal listing is shown on **Table 2** above.

7.1 Puget Sound Fall Chinook Salmon

7.1.1 Habitat Requirements and Population Status

Chinook salmon are found from the Ventura River in southern California up to Point Hope, Alaska. The species is also found from the Anadyr River in the Russian Federation south to Hokkaido, Japan. Puget Sound fall-run chinook are listed as an Evolutionarily Significant Unit by the National Marine Fisheries Service. Puget Sound fall run chinook salmon are documented within the North Creek drainage basin. Fall chinook salmon, migrating upstream from late July through September, tend to be the most abundant Puget Sound salmon run.

Chinook salmon require gravel-bedded rivers and streams with clear, cold (42-58°F), well oxygenated waters. The stream bed gravels need to be relatively free from silts and fine sands to allow free flow of water and oxygen to eggs deposited in the gravel spaces. Eggs incubate for several weeks to months before hatching as alevins. Juvenile chinook (fry) emerge from the gravel and will either spend several hours to several years in freshwater before migrating to the ocean. Juvenile and sub-adult chinook spend from one to five years in the ocean before returning to freshwater to spawn.

The Sammamish River/Duwamish River basin of WRIA 9 provides one of three large runs of chinook in the Puget Sound area. Chinook enter the Sammamish River generally in mid-August and spawn from mid-September through November (Myers, et al., 1998). Critical habitat for chinook salmon in the Sammamish River basin includes riparian zones functionally adjacent to stream channels. Juvenile chinook may remain in fresh water from a few days to three years (Wydoski and Whitney 1979). Juveniles that remain in fresh water prefer to remain in main stem rivers and streams, generally seeking cover in pools and backwaters.

Puget Sound chinook salmon numbers have been directly impacted by loss of tributary and main stem habitat from dams, and slough and side-channel habitat from diking, dredging, and hydromodification (Good *et al*., 2005). Puget Sound chinook salmon are a Federally-threatened and State candidate species. The Puget Sound population of chinook salmon was listed as a Federally-threatened species on 16 March 1999. chinook salmon habitat throughout the Evolutionarily Significant Unit (ESU) is degraded as the result of blockage, forest practices impacting upper tributaries, and agriculture and urbanization impacting lower tributaries and main stem rivers.

7.1.2 Known Occurrences within the Action Area

The Sammamish River is known to support the fall Chinook for both spawning and rearing. The Sammamish River is also an important conduit for Chinook to reach several smaller tributary streams, including those in the Issaquah Creek drainage basin.

7.2 Puget Sound Coho Salmon

7.2.1 Habitat Requirements and Population Status

Coho salmon occur from Monterey Bay, California north to Point Hope, Alaska, and from the Anadyr River in the Russian Federation south to Hokkaido, Japan. Puget Sound coho are listed

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as an ESU by NMFS. The majority of streams and rivers without barriers to fish passage that drain into Puget Sound support runs of coho salmon. North Creek is known to support runs of coho salmon.

Most west coast coho salmon enter rivers in October, and spawn from November to December. Coho spawn in the gravel of stream riffles. Eggs will hatch in approximately six to eight weeks as alevins. Fry emerge from the gravel and congregate in schools in stream pools and backwaters. Coho will live in fresh water for up to 15 months, rearing in fresh water before migrating to the ocean. Peak out-migration timing of juvenile coho generally occurs in May. After approximately a year in their natal streams, the coho smolts out-migrate relatively quickly out to the open ocean where they live for up to two years before they return as adult spawners.

Coho salmon are at risk due to human-induced changes in critical salmon habitat, typically the streams where coho spawn. These streams are easily impacted by point and non-point pollution, loss of wetland habitat, and loss of vegetative cover. Native coho stocks appear to be diminishing in the face of increased numbers of hatchery-released stock (stock that threatens the genetic diversity of the ESU). Coho salmon are listed as a Federal species of concern as of 15 April 2004.

7.2.2 Known Occurrences within the Action Area

As with Chinook salmon, the Sammamish River is known to support coho salmon. Coho are indicated as utilizing the Sammamish River for rearing and migration. As with Chinook salmon, the Sammamish River is an important conduit for coho to reach several smaller tributary streams and the Issaquah Creek drainage basin.

7.3 Puget Sound Steelhead

7.3.1 Habitat Requirements and Population Status

Runs of steelhead trout are present in many streams and rivers that drain into Puget Sound that do not have barriers to fish passage. Spawning generally starts in late March, and is usually completed by early June. Puget Sound steelhead begin life in streams and migrate to seawater as smolts. In Washington, they become smolts between the ages of 2 and 3 years. They are variable with respect to the time (1-7 years) they spend feeding in freshwater before migrating to the Pacific Ocean (Wydowski and Whitney, 2003). Puget Sound Steelhead is listed as a Federal threatened species on 11 May 2007.

7.3.2 Known Occurrences within the Action Area

Puget Sound Steelhead are listed as utilizing the Sammamish River for migration purposes only. The Sammamish River does not provide suitable spawning habitat for steelhead. The Sammamish River does provide a conduit for steelhead to reach more suitable spawning habitats located in tributary streams, including the Issaquah Creek drainage basin.

7.4 Bull Trout

7.4.1 Habitat Requirements and Population Status

The historic range of bull trout has contracted from pre-settlement times to today. Bull trout were found throughout the Columbia River Basin to western Montana, south to the Jarbridge River in Northern Nevada, the Klamath Basin in Oregon, the McCloud River in California, and north to Alberta, British Columbia, and southeastern Alaska. The current range of bull trout is now in the upper tributary streams. They have been eliminated from main stem rivers and are now extinct in northern California.

Bull trout are native char, most often found in high glacially-fed watersheds or near cold perennial springs. In Puget Sound, an anadromous component of the bull trout population is also found in estuarine waters near the mouths of natal rivers. Bull trout are able to forage in

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different river systems, accessing them from the Puget Sound. Bull trout were listed throughout the conterminous United States as a Federally-threatened species on 1 November 1999.

Generally, spawning in most bull trout populations occurs in September and October when water temperatures drop below 9ºC. In this region, the downstream limit of successful char spawning is always upstream of the winter snow line (that elevation at which snow is present on the ground for much of the winter (WDFW, 1999). Fry are usually found in shallow, backwater side channels and eddies. Older, larger individuals are often found in deeper stream pools or in lakes in deep water with temperatures less than 15ºC (Pratt, 1992).

Bull trout populations have been impacted through destruction of suitable rearing and migration habitat. These fish require cold, clean water. Increased water temperatures, reduced water quality, and reduced stream flows severely impact bull trout populations.

7.4.2 Known Occurrences within the Action Area

Bull trout are indicated as using the Sammamish River for migration. The Sammamish River does not provide suitable spawning habitat for bull trout and the water within the river is often too warm for bull trout survival during the summer months. Bull trout are known to migrate to other streams and even other Water Resource areas.

CHAPTER 8. HABITAT SUITABILITY AND AVAILABILITY

The Sammamish River corridor between Lake Sammamish and the City of Redmond provides minimal salmonid habitat. The river is extensively modified by channelization and dredging, which have created a glide with lake-like conditions for several river miles. Some channel restoration work has occurred within the City of Redmond to create a more natural river channel through additions of anchored large woody debris. This is a small-scale restoration effort that does not provide any overall habitat gains for the Sammamish River. This restoration work is an excellent template for future habitat restoration work on the Sammamish River.

The Sammamish River is not contiguous with its historic floodplain. Wetland fill and increasing quantities of impervious surfaces have reduced groundwater recharge within the Sammamish River valley, subsequently limiting hydraulic inputs of cool groundwater into the Sammamish River. Summertime water temperatures often exceed lethal limits for salmonids.

The lack of significant levels of vegetation on the river banks or in the river buffer limits large woody debris and organic material recruitment necessary for a healthy riparian ecosystem. A lack of large woody debris prevents the creation of backwater conditions used by salmonids during migration. Large woody debris also helps to create streambed structure.

The Sammamish River located in the Action Area is characterized by development, high water temperatures, lack of large woody debris and organic material recruitment. The river banks are generally grass-lined and the river contains low amounts of large woody debris. Spoils from historic dredging operations have created berms on the river banks that prevent natural groundwater inflows or stormwater surface flows.

Salmonid use of the Sammamish River corridor is limited to migration of anadromous fish during the cooler seasons (fall through spring). Adult salmon utilize the Sammamish River during the fall and winter to migrate to other tributaries for spawning and salmon fry migrate from tributaries to the Puget Sound as water temperature permits.

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CHAPTER 9. ENVIRONMENTAL BASELINE CONDITIONS

9.1 Existing Environmental Baseline

The Sammamish River within the Woodinville City limits is confined by levees. The Army Corps of Engineers is responsible for the maintenance of bank armoring. Levee maintenance is performed by the Corps.

The Woodinville Lumber property was built in 1979. At that time, approximately 60% of the property was developed (based on interpretation of aerial photographs, 1980). The remainder of the property that was not developed was between the Sammamish River and the developed portion. By 1990, the property had been developed to its current footprint.

The left bank levee of the Sammamish River (adjacent to the Site) is currently vegetated predominantly with reed canarygrass and non-native blackberries. Some native shrubs and small red alder trees occur in spots along the bank. The levee, itself, appears to be stable with no signs of erosion or other damage.

The ½ mile Action Area includes portions of Woodin Creek and Gold Creek where these streams flow into the Sammamish River. Woodin Creek is approximately 2,070 feet northwest of the Site. Gold Creek is approximately 1,690 feet southeast of the site. Both streams have documented usage by coho salmon. In addition, both streams have had their connection to the Sammamish River restored within the past decade. Previously, these streams flowed through pipes under the right bank levee and were a barrier to fish passage.

The portion of the Action Area located landward of the right bank of the Sammamish River is mostly used for agriculture. Numerous drainage ditches exist and have been mapped by King County. This eastern portion of the Action Area also includes residential development on the hillside east of 140th Place NE.

The portion of the Action Area located landward of the left bank of the Sammamish River is developed for commercial-industrial uses. The commercial-industrial development extends from the Sammamish River to the Burlington Northern rail road tracks west of Woodinville-Redmond Road. The portion of the Action Area west of the rail road tracks is mostly undeveloped and forested. Developed areas include a couple of subdivisions, mostly located in the southwest portion of the Action Area.

9.2 Relationship between Habitat in Action Area and Biological Requirements of the Species

The Action Area for the Reserve at Woodinville property includes approximately 6,780 lf of the Sammamish River, approximately 2,950 lf of Woodin Creek, and approximately 2,280 lf of Gold Creek (not including a side channel/ditch to the north). The environmental baseline conditions for the Sammamish River are summarized on **Table 3** below.

Table 3. Environmental Baseline of the Action Area - Sammamish River

PATHWAYS INDICATORS	ENVIRONMENTAL QUALITY[1]		
	Properly Functioning	At Risk	Not Properly Functioning
Water Quality: Temperature			X_2
Sediment/Turbidity	X_3		
Chemical Contamination/Nutrients	X_4		
Habitat Access: Physical Barriers	X_5		

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Habitat Elements: Substrate			X_6
Large Woody Debris			X_7
Pool Frequency			X_8
Pool Quality			X_9
Off-Channel Habitat			X_{10}
Refugia		X_{11}	
Channel Condition & Dynamics: Width/Depth Ratio			X_{12}
Streambank Condition	X_{13}		
Floodplain Connectivity			X_{14}
Flow/Hydrology: Peak/Base Flows			X_{15}
Drainage Network Increase			X_{16}
Watershed Conditions: Road Density & Location		X_{17}	
Disturbance History			X_{18}
Riparian Reserves		X_{19}	

1. This table briefly summarizes the baseline environmental quality of the Action Area (modified from National Marine Fisheries Service, 1996).
2. Temperature of water in the Sammamish River regularly exceeds lethal levels during the summer months. (SRCAP).
3. No documentation or data showing sediment or turbidity issues within this (or any) reach of the Sammamish River. Lack of such documentation suggests that sediment and turbidity are likely within acceptable levels.
4. Despite the high levels of agriculture on either side of the river, no records indicate exceedances of chemical contamination or nutrients within the Sammamish River.
5. No physical barriers exist anywhere on the Sammamish River that would impede salmon migration.
6. The substrate of this reach of the Sammamish River is unknown. However, there is likely to be highly silty or embedded gravel and cobble due to past dredging. The Sammamish River has no new sources of gravel or cobble recruitment.
7. All large woody debris was historically removed from the river, first to provide free navigation by river boats, and later during dredging and channelization. There are currently no significant sources of large woody debris recruitment for the Sammamish River.
8. Past dredging and channelization work on the Sammamish River has removed all pools and riffles.
9. Same as #8 above.
10. Channelization of the Sammamish river and subsequent conversion of associated bottomland to agricultural and commercial uses has eliminated all off-channel rearing habitat on the river.
11. Same as #10 above.
12. Past dredging of the Sammamish River has created a channel of near constant width and depth.
13. Despite the artificially manipulated morphology of the river, the stream banks are stable and well vegetated. The vegetation unfortunately consists of invasive reed canarygrass and non-native blackberries.
14. Side cast deposition from past channel dredging has created berms that disconnect the river from its historic floodplain. Additionally, the adjacent wetlands were drained and converted into agricultural lands. This is coupled with and extensive amount of new impervious surfaces within the historic Sammamish River valley.
15. The loss of floodplain and associated wetlands, loss of groundwater recharge, and increased amounts of impervious surfaces tie the flow patterns of the Sammamish River more closely to flashy storm-driven events.
16. Same as Item #16 above.
17. Urban growth within the Sammamish River valley provides a high density of roads.
18. The entire length of the Sammamish River has been significantly modified since the beginning of European settlement. Historic refugia and riparian areas no longer exist.
19. Same as Item #18 above.

The environmental baseline conditions for the Woodin Creek are summarized on **Table 4** below.

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Table 4. Environmental Baseline of the Action Area - Woodin Creek

PATHWAYS INDICATORS	ENVIRONMENTAL QUALITY[1]		
	Properly Functioning	At Risk	Not Properly Functioning
Water Quality: Temperature		X[2]	X[2]
Sediment/Turbidity		X[3]	
Chemical Contamination/Nutrients			X[4]
Habitat Access: Physical Barriers			X[5]
Habitat Elements: Substrate			X[6]
Large Woody Debris			X[7]
Pool Frequency			X[8]
Pool Quality			X[9]
Off-Channel Habitat			X[10]
Refugia			X[11]
Channel Condition & Dynamics: Width/Depth Ratio	X[12]		
Streambank Condition		X[13]	
Floodplain Connectivity			X[14]
Flow/Hydrology: Peak/Base Flows			X[15]
Drainage Network Increase			X[16]
Watershed Conditions: Road Density & Location			X[17]
Disturbance History			X[18]
Riparian Reserves			X[19]

1. This table briefly summarizes the baseline environmental quality of the Action Area (modified from National Marine Fisheries Service, 1996).
2. Temperature of water in Woodin Creek exceeds lethal levels during the summer months. (Woodin Creek Basin Habitat Assessment Final Report (WCBHAFR)).
3. Sediment levels are generally low. Potentially unstable soil conditions higher in the watershed could contribute to higher turbidity during storm events (WCBHAFR).
4. Woodin Creek does not meet State standards for fecal coliform near its mouth. It also has elevated levels of nitrates, nitrites, and pH during the winter months, low dissolved oxygen and high temperature during the summer months (WCBHAFR).
5. An extended length of Woodin Creek is in a pipe (approximately 3,200 lf) that acts as a total fish passage barrier (WCBHAFR).
6. Substrate is highly embedded from the mouth to the pipe (WCBHAFR).
7. All large woody debris has been removed in Woodin Creek from the mouth to the pipe. Recruitment is limited in the upper reaches. No material can migrate past the pipe to the lower reach (WCBHAFR)
8. Adolfson and Associates (2004) counted only 27 pools per mile of stream (WCBHAFR). This is insufficient frequency to qualify as “properly functioning.”
9. Pools that do exist lack sufficient vegetative cover (WCBHAFR).
10. From the mouth to the pipe, no off-channel refugium exists. Upstream of the pipe is higher in the watershed with a higher gradient streambed. No refugia is likely upstream of the pipe (WCBHAFR).
11. Same as #10 above.
12. Overall width to depth ratio was estimated to be greater than 10:1 by Adolfson and Associates (2004).
13. Stream bank is armored from the mouth to the pipe. Upper reaches upstream of the pipe have a steeper gradient and flows through soils more prone to erosion.
14. The floodplain of the Sammamish River has been extensively modified. The lower reach of Woodin Creek from the mouth to the pipe has been channelized and armored. There is little connectivity of Woodin Creek with its historic floodplain (WCBHAFR).
15. Adolfson and Associates determined that over 40% of the Woodin Creek basin is impervious surfaces. This level of impervious surfaces typically increases the difference between peak flows and base flows (WCBHAFR).
16. Same as Item #16 above.

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17. Urban growth within the City of Woodinville provides a high density of roads.
18. Same as Item #17 above.
19. The lower reach of Woodin Creek has been extensively modified and any natural riparian vegetation has been removed. Upstream of the piped portion of the creek, the habitat is present but fragmented (WCBHAFR).

We were not able to find published information regarding Gold Creek. We do know that the mouth of the stream was restored in 1999 from a perched pipe through the levee to an open stream channel. We believe that the conditions present in Gold Creek will likely be similar to conditions identified in Woodin Creek by Adolfson and Associates (2004) due to the similarities in the landscape for both basins.

9.3 Sammamish River Watershed

9.3.1 Water Quality

The Sammamish River corridor Action Plan (SRCAP) report, produced in 2002, describes water quality in the Sammamish River: "…water quality in the Sammamish River is poor. Although the Sammamish River is officially classified as a Class AA stream (WAC 173-201), for some parameters, it does not even meet Class C water quality standards set by the State of Washington."

The Sammamish River is listed on the approved 2008 Washington State 303(d) list for exceedances of temperature, dissolved oxygen, and fecal coliform standard levels (WDFW, accessed 28 February 2009). Summertime daytime temperatures in the river have been measured as high as 26.6° C, which is well above lethal limits for salmonids (SRCAP, 2002). Temperature issues in the Sammamish River begin at the head of the river where warm lake waters form the initial flow. Tributary flows from Big Bear Creek decrease these warmer lake waters to some extent. However, beginning in the City of Redmond, and north to the City of Woodinville, the river channel is devoid of almost all vegetative cover and is relatively straight, exposing it to almost constant solar insolation throughout a major portion of the daylight hours. West of the confluence with North Creek, the Sammamish River receives improved shading from trees and shrubs.

9.3.2 Water Quantity

Water quantity in the Puget Sound region has changed significantly from pre-settlement times to the present. A combination of public and private works has contributed to the existing hydrologic regime in the Puget Sound region water bodies. The ongoing removal of large woody debris and dredging to permit river boat travel created some of the initial hydrologic alterations. The diversion of the Lake Washington outflow from the Black River to the created Lake Washington Ship Canal Locks, and the excavation of the Montlake Cut, contributed to lowering Lake Washington by nine feet below historic levels. Lake Sammamish water levels also decreased to six feet below historic levels. The Sammamish River was eventually straightened and dredged to drain the surrounding wetland areas for agricultural uses. Water management and withdrawals from the river have reduced the summer base flow in the Sammamish River. Impervious surfaces in the historic floodplain have further reduced groundwater recharge, which also reduces base flow conditions. This water typically is shunted to regional stormwater detention facilities for treatment and eventual release to local streams. This release does not mimic the hydrologic characteristics of natural groundwater base flow input.

9.3.3 Sammamish River Corridor Action Plan (SRCAP)

The SRCAP (2002) describes methodology to protect and improve water quality and quantity in the Sammamish River. The overarching strategy involves the following bullet items quoted from the SRCAP document:

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- "Restore riparian areas throughout the river corridor by re-grading the river's banks and planting them with native vegetation to provide shade, cover, and enhanced habitat and habitat-forming processes for all native fish and wildlife.
- Create and enhance pools in the river channel to provide cool-water refuge and cover, particularly for migrating adult salmon; design the pools to be sustained over time by the river's hydraulics.
- Explore engineered solutions to cool the river upstream of Bear Creek where thermal stress for migrating adult salmon is greatest.
- Protect all major tributaries to the river, particularly Bear Creek, as sources of cool water for the river and has habitat for other life stages of fish and wildlife using the river.
- Apply adaptive management systematically across jurisdictions, monitor projects closely, and compare them to each other and to baseline conditions, to identify features of greatest value to include in future projects as progress is made toward river-wide restoration."

9.3.4 Habitat Access and Connectivity

Habitat access and connectivity was determined to be "properly functioning" based on the relative ability of fish to access larger tributary streams, Lake Sammamish, and the tributary streams to Lake Sammamish.

9.3.5 Habitat Elements

The Sammamish River is lacking in habitat elements, notably large woody debris, pools and pool quality, access to refugia, and access to off-channel habitat. These habitat elements were mostly removed or destroyed when the Sammamish River was channeled between levees and the water level lowered.

9.3.6 Channel Conditions and Dynamics

The Sammamish River's channel conditions and dynamics were significantly altered when it was channelized between levees. The streambank conditions, however, are considered to be properly functioning due to armoring and significant amounts of vegetation (even though the predominant vegetation consists of non-native weedy species, such as Himalayan blackberry and reed canarygrass).

9.3.7 Flow/Hydrology

Flow and hydrology within the Sammamish River is largely driven by the relatively high levels of urban and agricultural development within the Sammamish River valley. A high percentage of impervious surfaces often results in increased peak flows during storm events. Most of the Sammamish River and its tributaries are mostly disconnected from historic flood plains, so storm flows tend to surge into the River quickly after storm events.

9.3.8 Watershed Conditions

The Sammamish River is protected to some degree from high road densities due to the amount of agricultural land still adjacent to the river. Some reaches of the river, especially near the mouth at Lake Washington and the source at Lake Sammamish, contain some relatively natural forested habitat. Efforts have occurred in the City of Redmond to restore a portion of the Sammamish River to a more natural streambed morphology, with a gravel-cobble streambed and large woody debris. The amount of development and continuing agricultural land uses adjacent to the River indicate a high level of historical disturbance.

CHAPTER 10. PROPOSED PROJECT

10.1 Project Description

Panattoni Development Company proposes to redevelop the Woodinville Lumber property (**Appendix B**). The proposed project consists of two speculative warehouse buildings with a combined footprint of about 199,700 square feet (sf) with a future second floor area totaling

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approximately 30,000 sf. Parking will be developed for approximately 200 cars. Paved areas for parking and access will be located on all sides of the new buildings, and the warehouse portion of the structure will have loading docks on both the east and west sides. All but one existing building on the site will be removed. The building to remain is located in the northwest corner of the site and will serve as office space. The new buildings will take up the majority of the eastern portion of the site. Site landscaping will be provided per Woodinville code requirements and will include parking lot landscaping, perimeter landscaping, and landscaping adjacent to the office spaces.

Portions of the proposed buildings, along with paved parking and loading areas, will be located within the Urban Conservancy shoreline environment (the outer 100 feet) of the 200-foot shoreline zone. These uses are permitted in the Urban Conservancy shoreline environment per Woodinville's SMP. No development is allowed and none is proposed within the inner 100-foot shoreline Conservancy environment directly adjacent to the Sammamish River. The 100-foot shoreline Conservancy environment is also concurrent with the 100-foot reduced stream buffer defined by the City of Woodinville critical areas regulations.

The site will be fully developed in a single phase including offsite improvement along Woodinville Redmond road (SR-202) and driveway improvement inside a vested access across the King County Park property from the public street. On site work will include grading, storm drainage, connections to existing on site sewer and water lines, building construction and associated site improvements along with connections to offsite wet and dry utilities.

10.1.1 Stormwater Management Design

The proposed stormwater management for the Project will be improved over existing conditions, but discharge to the Sammamish River will still occur at the two existing discharge points (North Discharge Point and South Discharge Point). Improvements to be implemented include enhanced basic water quality treatment. Stormwater detention is not currently provided on the site and is not proposed or required for the proposed redevelopment. Stormwater management and treatment will be designed according to the 2009 King County Surface Water Design Manual, per City of Woodinville municipal code.

Stormwater Treatment for Pollutant-Generating Surfaces

The new stormwater system will include a series of catch basins and tightlines to convey water from pollutant-generating surfaces (primarily paved areas for parking and loading) to a stormwater treatment water quality facility at the southeast corner of the site. This facility will consist of a pre-settlement pond and a constructed wetland treatment area. The constructed wetland treatment area will consist of a depression with a low-gradient swale at the bottom to allow water to slowly flow through. The depression and swale will be planted with native emergents to enhance treatment. The side slopes of the facility will be planted with native shrubs. The treated stormwater from this facility will be conveyed from the treatment facility via tightline and discharged at the South Discharge Point within the Sammamish River buffer.

Clean Rooftop Runoff

In addition to stormwater treatment within the water quality facility described above, clean rooftop runoff will be collected and conveyed without treatment and discharged at the North Discharge Point within the river buffer.

Media Filter Strip for Parking Lot Runoff

The project also proposes to utilize a filter strip to directly treat runoff from the parking area between the new warehouse building and the river buffer. Stormwater will sheet flow to the edge of the buffer where it will be infiltrated and treated within a 15-foot wide engineered media filter strip. The filter strip will consist of several different zones of engineered permeable soil and gravel mixtures designed to treat and infiltrate the majority of the runoff from this area of

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pavement. The filter strip will also be planted with native shrubs adapted to both wet and dry conditions for enhanced treatment, soil stabilization, and aesthetics. Any runoff that is not infiltrated will be collected in a shallow swale and conveyed to the southernmost existing stormwater outfall ditch, where it will discharge to the Sammamish River. The filter strip has been designed in accordance with the general water quality maintenance standards of the 2009 King County Surface Water Design Manual.

Stormwater Management Facilities Allowed Within the Stream Buffer

According to WMC §21.24.390(4), the following surface water management activities and facilities may be allowed in stream buffers:

(a) *Surface water discharge to a stream from a detention facility, presettlement pond, or other surface water management activity or facility may be allowed if the discharge is in compliance with the King County Surface Water Design Manual.*
(b) *Stormwater management facilities, grass-lined swales, and dispersal trenches may be located in the outer 25 percent of the buffer area.*

The discharge of stormwater from the proposed site will meet or exceed all current stormwater design standards and will not adversely affect the quality of water within the Sammamish River adjacent to the Site. In addition, both the engineered media filter strip and the low-gradient treatment swale described above will be located within the outer 25 percent of the buffer area as allowed pursuant to “b” above.

10.1.2 Shoreline Viewpoints

WMC §21.24.390(5) allows public and private trails, and visual access to the stream is encouraged in stream buffers provided:

(a) Trail surface shall not be made of impervious materials, except that public multi-purpose trails may be made of impervious materials if they meet all other requirements including water quality.

The proposed project includes two short paths accessing two shoreline viewpoints within the stream buffer. Each viewpoint will have a bench for seating, and the paths and viewpoint areas will be surfaced with woodchips, per WMC §21.24.390(5). These viewpoints are being provided as amenities to occupants and users of the new warehouse building and associated offices, and also to provide shoreline access per the requirements of Woodinville’s SMP. See the mitigation plans in **Appendix B** for a depiction of the viewpoint locations.

10.2 Assessment of Development Impacts

FEMAs floodplain habitat assessment and mitigation document outlines the general framework for reporting direct and indirect impacts to fish habitat resulting from development within a floodplain. The reporting format includes a discussion of direct and indirect impacts, effects from interdependent and interrelated actions, and cumulative effects. An analysis of effects of development impacts upon the Sammamish River are contained on **Table 5**. These items will be discussed in the following sections of this report.

Table 5. Effects of Projected Actions

Pathways	Environmental Baseline			Effects of Projected Actions on Environmental Conditions		
Indicators	**Properly Functioning**	**At Risk**	**Not Properly Functioning**	**Improved**	**Maintained**	**Degraded**
Water Quality						
Temperature			**X(1)**		**X(1)**	
Sediment	**X(2)**				**X(2)**	
Chemical Contaminants/	**X(3)**				**X(3)**	

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Pathways	Environmental Baseline			Effects of Projected Actions on Environmental Conditions		
Indicators	**Properly Functioning**	**At Risk**	**Not Properly Functioning**	**Improved**	**Maintained**	**Degraded**
Nutrients						
Habitat Access						
Physical Barriers	**X(4)**				**X(4)**	
Habitat Elements						
Substrate			**X(5)**		**X(5)**	
Large Woody Debris			**X(6)**		**X(6)**	
Pool Frequency			**X(7)**		**X(7)**	
Pool Quality			**X(8)**		**X(8)**	
Off-channel Habitat			**X(9)**		**X(9)**	
Refugia		**X(10)**			**X(10)**	
Channel Condition and Dynamics						
Width/Depth Ratio			**X(11)**		**X(11)**	
Streambank Condition	**X(12)**				**X(12)**	
Floodplain Connectivity			**X(13)**		**X(13)**	
Flow/Hydrology						
Peak/Base Flows			**X(14)**		**X(14)**	
Drainage Network Increase			**X(15)**		**X(15)**	
Watershed Conditions						
Road Density and Location		**X(16)**			**X(16)**	
Disturbance History			**X(17)**		**X(17)**	
Riparian Reserves		**X(18)**			**X(18)**	

1) Temperatures recorded in the Sammamish River regularly exceed State water quality limits. The scope of the project is too small to have an effect on water temperature throughout most of the watershed. The Effects of the Projected Actions is “Maintained.”
2) No work within the ordinary high water mark of the Sammamish River will occur. The Effects of the Projected Actions is “Maintained.”
3) The construction project design protects against additional inputs of chemical contaminants and nutrients. The finished project will not increase inputs of chemical contaminants and nutrients. The Effects of the Projected Actions is “Maintained.”
4) There are no known physical barriers to fish migration from Lake Washington to the action area. No activities will occur in the Sammamish River that will create physical barriers to fish migration. Therefore, the Effects of the Projected Actions is “Maintained.”
5) No activities will occur within the ordinary high water mark of the Sammamish River. There will be no change in the substrate of the river within the action area. Therefore, the Effects of the Projected Actions is “Maintained.”
6) The reach of the Sammamish River within the Action Area met the requirements for a properly functioning riparian system in terms of numbers of LWD per river mile. It should be noted that the banks of the Sammamish River in the action area do not have sufficient tree cover to provide local recruitment of LWD. No work is planned to install LWD within the Sammamish River. The Effects of the Projected Actions is “Maintained.”
7) Changes in stream hydrology caused by upstream development has altered the frequency of pools within the Sammamish River. Pool frequency within the watershed is beyond the scope and scale of the proposed project. The Effects of the Projected Actions is “Maintained.”
8) Pool quality within the Sammamish River watershed is affected by many of the same factors as pool frequency. Pool quality issues within the watershed is beyond the scope and scale of the proposed project. The .Effects of the Projected Actions is “Maintained.”

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9) Off-channel habitat is generally lacking within the Sammamish River watershed. This lack of off-channel habitat is beyond the scope and scale of the proposed project. The Effects of the Proposed Actions is "Maintained."
10) Refugia is generally lacking within the Sammamish River watershed. See #9 above. The Effects of the Proposed Actions is "Maintained."
11) The channel width to depth ratio was determined to be not functioning properly. The proposed project will not alter the Sammamish River channel and will have no effect on the width to depth ratio. The Effects of the Proposed Actions is "Maintained."
12) Despite years of watershed modification, streambank armoring and levee construction, the current stream banks are stable with no visible sign of erosion. No work is planned within the ordinary high water mark for the Sammamish River. The Effects of the Projected Actions is "Maintained."
13) The development in the Sammamish River watershed, which includes construction of revetments and levees, has allowed development to occur up to the banks of the levees in many areas. Within the action area and continuing downstream, the Sammamish River is completely disconnected from its historic floodplain. No work will occur within the ordinary high water mark of the Sammamish River that might otherwise affect floodplain continuity. The Effects of the Proposed Actions is "Maintained."
14) The peak/base flow hydrograph of the Sammamish River has been significantly modified since the early 1900s. The average water level within the Sammamish River and Lake Sammamish has been reduced several times. Additionally, the river is confined by revetments and levees that prevent active flooding. The result is higher and longer lasting peak flows through the action area compared to historic (pre-European) conditions. The proposed project will not affect this habitat pathway for the Sammamish River. The Effects of the Proposed Actions is "Maintained."
15) The high level of commercial and industrial development in the Woodinville area has a concomitant high density of roads. This has increased the drainage network above the undeveloped conditions. The proposed project will not increase or decrease the drainage network in any appreciable way. The Effects of the Proposed Actions is "Maintained."
16) Same as Item #15 above.
17) The commercial and industrial development along the Sammamish River, and past agricultural land uses provides a high level of historic disturbance. The proposed project will neither increase nor decrease the amount of disturbance in any appreciable way. The Effects of the Proposed Actions is "Maintained."
18) Same as Item #13 above. The proposed project will not create any new riparian reserves. The Effects of the Proposed Actions is "Maintained."

10.2.1 Sammamish River Buffer Reduction

The required standard buffer for the Sammamish River, based on City of Woodinville Municipal Code §21.24.380(1), is 150 feet. The standard buffer may be reduced to 115 feet with buffer enhancements. The 115-foot reduced buffer can be further reduced to 100 feet if the buffer functions within the 100-foot buffer can be shown to be equivalent to those of a 115-foot buffer. Section §21.24.380(1)(a) states:

> *"The standard buffer width will be established unless the existing stream buffer is significantly degraded. If the existing stream buffer is significantly degraded, the applicant may use the reduced buffer as referenced in subsection (1) of this section as long as enhancement measures are implemented to provide a net improvement in overall stream and buffer function and value as determined by a qualified biologist. Enhancement measures shall be conducted in accordance with a plan approved by the Development Services Director."*

Under current site conditions, the buffer is already effectively reduced below the 100-foot minimum. Development currently encroaches into the outer portion of the 150-foot standard buffer, and the existing vegetated buffer width primarily ranges between approximately 32 and 87 feet, less than even the minimum 100-foot width. The project will actually restore paved areas to native buffer in order to achieve a consistent 100-foot width.

10.2.2 Floodplain Storage Loss

The project proposes to fill two small areas of the existing 100-year FEMA-regulated floodplain on the Site. This zone is referenced on the plans as Flood Zone AE. One area is the western portion of the existing ditch that extends east-west through the center of the Sammamish River buffer, and the other is a small portion of the existing grass-lined swale that runs north-south in

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the southern portion of the buffer. See **Sheet W1.1** in **Appendix B** for a graphic depiction of these areas. A total of 3,740 cubic feet of flood storage will be filled.

10.2.3 Direct Effects

FEMA defines eleven elements of direct effects that need to be addressed in a habitat assessment and mitigation report. These are:

1. First primary constituent elements;
2. Second primary constituent elements;
3. Third primary constituent elements;
4. Essential fish habitat;
5. Fish and wildlife habitat conservation areas;
6. Vegetation community and habitat structures;
7. Water quality;
8. Water quantity;
9. Channel planform pattern and migration processes;
10. Spawning substrate; and,
11. Floodplain refugia.

10.2.3.1 First Primary Constituent Element

The first primary constituent element for anadromous fish, as defined by NMFS concerns the availability of freshwater spawning sites with appropriate habitat structures, spawning substrate, and other necessary stream attributes. The spawning requirements for anadromous fish are not all the same between species.

Chinook

The first primary constituent element for Chinook salmon is freshwater spawning sites. Spawning sites must have water quality and quantity conditions along with substrate supporting spawning, incubation, and development of juvenile Chinook salmon. Chinook spawning habitat is variable, but is often determinant upon water temperatures below 56°F. Substrate composition, cover, water quality and quantity are important for spawning site selection. Gravel sizes suitable for Chinook spawning range from 0.5 inches to 6 inches. Stream bed gravel should have little imbeddedness[2].

Chinook will spawn in side channels and small streams with water depths as little as 5 inches, or in main river channels at depths greater than 23 feet. According to the Initial Snohomish River Basin Chinook Salmon Conservation/Recovery Technical Work Plan, the average spawning depths are between 12 to 16 inches.

Spawning streams are typically less than 3% gradient with current velocities between 4 inches per second up to 60 inches per second (approximately 3 mph). The average current velocity is approximately 1 mph (16 to 24 inches per second).

The Sammamish River in the Action Area is a relatively deep (up to 20 feet deep) river. We are unaware of any streambed studies that have been performed on any portion of the Sammamish River. However, we suspect that its relatively shallow gradient (generally less than 0.1 percent), lack of sinuosity, and lack of large woody debris or other structures would contribute to a relatively high degree of imbeddedness of any potential spawning gravels. This assumption is supported by data compiled for the *Sammamish River Water and Sediment Quality Assessment Final Report* prepared by King County Department of Natural Resources and Parks (June 2005). Two of the stations studied are directly upstream and downstream of the Site. At both stations, gravel comprised between 1 percent up to 35 percent of the streambed material. The

[2] The term “imbeddedness” refers to the relationship between gravel and finer particles make up a stream bed. Imbedded gravel is gravel held in place by sands and silts making it difficult for fish to create their redds.

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largest component of the streambed composition at both stations was sand (between 60 percent and 93 percent). This data suggests a high level of imbeddedness exists within the Sammamish River.

Water temperature during the Chinook spawning season is generally favorable to successful spawning through to the emergence of fry. Water temperatures generally exceed threshold limits by early- to mid-summer. However, fry generally migrate out of the Sammamish River before these temperatures are reached.

Based on these data, we conclude that the Sammamish River adjacent to the Site provides little to no potential spawning habitat and, therefore, this reach of the Sammamish River does not provide the first Primary Constituent Element for Chinook salmon. There should be no direct effect to spawning habitat for Chinook salmon resulting from the proposed project.

Coho

Puget Sound ESU Coho salmon are listed as a Federal Species of Concern and not threatened or endangered. Data concerning PCE's for Coho are not well defined. Spawning habitat for Coho salmon is more specific than that required by Chinook salmon. The need for cool, clean water and appropriately sized gravel with little imbeddedness is important for viable coho spawning habitat. However, coho prefer to spawn in shallow tributaries, rather than larger river systems.

Coho salmon tend to spawn in the small streams with relatively fast water flow (up to 11 mph). Substrate suitable for spawning consists of smaller gravel (between 0.5 and 4 inches) with less than 20 percent fine material. Typical spawning areas are riffles or gravel beds where upwelling of cool, clean groundwater occurs. Water temperature should be between 40°F to 49°F.

As stated for Chinook salmon earlier, the Sammamish River within the Action Area does not provide sufficient habitat requirements to support coho salmon spawning activities. The gravel available in the substrate is heavily imbedded. The stream bed is essentially one long glide with no pools or riffles. It is likely that groundwater does not well up in sufficient quantities to provide spawning habitat for coho within the Action Area. There should be no direct effect on coho spawning habitat resulting from the proposed project.

Steelhead

Steelhead, like coho and Chinook salmon, require clean, cool water for successful spawning. Unlike coho and Chinook salmon, steelhead can spawn more than once.

Like coho, steelhead prefer to spawn in upper to middle reaches of rivers and smaller stream tributaries. Substrate suitable for spawning consists of small gravel to sand-gravel mixes (sizes range from 0.2 to 4 inches). Sand-gravel mixes must be permeable and contain less than 5 percent sand and silt to provide proper oxygenation to the eggs. Spawning typically occurs in relatively shallow water (6 to 24 inches deep). Water velocities are between 1 and 3.6 fps (0.7 to 2.5 mph). Water temperature for optimal spawning success is typically between 39°F to 52°F.

The Sammamish River within the Action Area does not provide sufficient habitat for steelhead spawning. The main channel of the river is too deep, contains no riffles and pools, and the stream bed consists of highly imbedded gravels. There should be no direct effect on steelhead spawning resulting from the proposed project.

Bull trout

Bull trout have the most specific habitat requirements of the four ESA species likely found within in the reach of the Sammamish River included in the Action Area. It is this selectivity that limits the relative distribution and abundance of bull trout.

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Bull trout are typically associated with colder streams, but can be found throughout a river system. Temperatures in excess of 59°F limit the migration of bull trout. Optimum spawning areas for bull trout are those streams with extremely cold water. Successful spawning occurs in low-gradient streams where the late-summer, early-fall water temperatures do not rise above 48°F.

The Sammamish River within the Action Area does not provide suitable spawning habitat for bull trout. During the times of the year that bull trout are typically spawning, water temperature is frequently exceeds 48°F. Additionally, the Sammamish River within the Action Area does not provide appropriate substrate or channel morphology required by bull trout for spawning (pools, riffles, and relatively shallow water). The proposed project is unlikely to directly affect spawning habitat for bull trout.

10.2.3.2 Second Primary Constituent Element

The second primary constituent element identified by NMFS is freshwater rearing sites with:

1. Water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility;
2. Water quality and forage supporting juvenile development; and,
3. Natural cover, such as shade, submerged and overhanging large wood, jams and beaver dams, aquatic vegetation, large rocks or boulders, side channels, and undercut banks.

Chinook

Chinook fry typically begin their downstream migration soon after emergence from the stream bed gravel and after yolk sac absorbance. Residence time in spawning areas is, therefore, limited with few individuals rearing in the natal streams. Typically, Chinook fry reside in freshwater for less than a year. Evidence suggests that Chinook fry can delay smoltification for up to one year and can overwinter in larger rivers and lakes. These "stream-type" Chinook may return to their natal streams the following spring. Factors limiting freshwater rearing appear to be the presence of cover, forage, refuge from high stream flows, and abundant cold, clean water.

The Sammamish River within the Action Area does not provide sufficient habitat for rearing resident populations of Chinook fry. The river has a very homogenous stream bed created in the early 1900s for navigation purposes. The river was dredged and all large woody debris, boulders and rocks, and any overhanging vegetation was removed. The river, itself, was straightened and confined by levees, which have disconnected the river from its floodplain and any off channel refugia. The proposed project will not likely directly affect rearing habitat for Chinook salmon

Coho

Newly hatched coho salmon typically reside within the gravel of their natal streams for up to three weeks while absorbing their yolk sac. Emergence from the gravel is usually between March to July. Optimum rearing habitat is a mixture of pools and riffles, instream debris, vegetative cover and cool water temperatures (between 38°F and 40°F degrees in the summer). Dissolved oxygen needs to be near saturation and the water relatively clear of sediments.

The Sammamish River within the Action Area does not provide adequate rearing habitat for juvenile coho salmon. Because the river was largely placed in a confined channel with a uniform streambed, the Sammamish River has no natural mixture of pools and riffles. All natural structure within the river was removed, eliminating potential areas for juvenile coho to find refuge. Finally, the water temperature during the summer frequently exceeds the typical limits for optimum rearing habitat and often reaches lethal levels for coho and other salmonids. The proposed project will not likely directly affect rearing habitat for coho salmon.

Steelhead

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Upon emergence from the streambed gravel, steelhead fry typically migrate to shallow protected areas. Habitat chosen usually has a cobble-rubble substrate and a depth of 14 inches or less and water temperature between 45 and 60. Older juvenile steelhead may utilize deeper pools and runs. Steelhead may remain within freshwater stream systems for up to three years before migrating to the ocean.

The Sammamish River within the Action Area does not provide sufficient rearing habitat for juvenile steelhead. The river as dredged in the early 1900s, which removed the natural structure of the streambed (cobbles, boulders, large woody debris, etc.) and homogenized the stream morphology. Additionally, the water temperature occasionally exceeds the tolerance limits for steelhead fry, sometimes peaking into lethal limits during the summer months. The proposed project will not likely directly affect rearing habitat for steelhead.

Bull trout

Bull trout exhibit two distinct life strategies. Populations can consist of resident fish (fish never migrate from their natal streams) to migratory (fish migrate to larger rivers or lakes). Research suggests that the two strategies can coexist within a system, but the migratory type will often dominate streams where migration is not impeded. It is not known if the resident form and the migratory form represent distinct and separate populations. Because bull trout do not exhibit anadromy, the rearing habitat for juvenile bull trout is likely the same as the required spawning habitat.

The Sammamish River within the Action Area does not provide habitat suitable for rearing of juvenile bull trout. The river lacks the physical structure characteristics and the cold water conditions necessary for survival. The proposed project is unlikely to directly affect rearing habitat for bull trout

10.2.3.3 Third Primary Constituent Element

The third primary constituent element identified by NMFS is "[f]reshwater migration corridors free of obstructions and excessive predation with water quantity and quality conditions and natural cover, such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival."

This primary constituent element is one that is generally applicable to all species of salmonids within the Sammamish River system. It is also one that is mostly lacking within the Action Area as well as a majority of the river. While the Sammamish River within the Action Area is relatively free of obstructions, it is also free of the forms of cover (large wood, large rocks and boulders, side channels of undercut banks) that most salmonids require. The lack of cover or structure within the river significantly reduces the value of the habitat for migrating salmonids. Also, the river frequently reaches temperatures lethal to salmonids during the summer months. The river provides a corridor to and from suitable spawning and rearing habitat, but provides little else other than a migratory corridor.

10.2.3.4 Essential Fish Habitat as designated by National Marine Fisheries Service

Essential Fish Habitat (EFH) is defined as:

"Those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity."

The following definitions clarify the aspects of EFH.

- "Waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish, and may include areas historically used by fish where appropriate.

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- "Substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities.
- "Necessary" means the habitat required to support a sustainable fishery and the managed species contribution to a healthy ecosystem.
- "Spawning, breeding, feeding, or growth to maturity: covers the full life cycle of a species.

The Sammamish River does not necessarily provide essential fish habitat for Federally-listed species of salmonids, but it is important in providing a conduit between ocean habitat and suitable spawning streams. Essential fish habitat has been determined for Puget Sound Chinook, coho, and steelhead. This habitat generally includes the Sammamish River.

The proposed project will not affect the existing quality of essential fish habitat within the Action Area

10.2.3.5 Fish and Wildlife Habitat Conservation Areas

The City of Woodinville defines fish and wildlife habitat conservation areas as including Type 1 waters and associated buffers. "Type 1 waters" are analogous to Type S waters and includes the Sammamish River through its entire length. City of Woodinville further provides fish and wildlife habitat conservation areas performance standards for activities that may affect such habitat. These standards are identified for anadromous fish under 21.24.440(4), which states:

(c) All activities, uses, and alterations proposed to be located in water bodies used by anadromous fish or in areas that affect such water bodies shall give special consideration to the preservation and enhancement of anadromous fish habitat, including, but not limited to, adhering to the following standards:

i. Activities shall be timed to occur only during the allowable work window as designated by the Washington State Department of Fish and Wildlife for the applicable species;
ii. An alternative alignment or location for the activity is not physically practicable
iii. The activity is designed so that it will not degrade the functions or values of the fish habitat or other critical areas; and
iv. Any impacts to the functions or values of the habitat conservation area are mitigated in accordance with an approved habitat management plan.

(d) Structures that prevent the migration of salmonids shall not be allowed in the portion of water bodies currently or historically used by anadromous fish. Fish bypass facilities shall be provided that allow the upstream migration of adult fish and shall prevent fry and juveniles migrating downstream from being trapped or harmed.

(e) Fills, when authorized pursuant to the City of Woodinville's Shoreline Management Master Program, shall not adversely impact anadromous fish or their habitat or shall mitigate any unavoidable impacts, and shall only be allowed for a water-dependent use.

The proposed development of the Site will be designed to meet or exceed the protections required by City of Woodinville municipal code for protection of fish and wildlife habitat conservation areas. The proposed project will not negatively impact the fish and wildlife habitat available adjacent to the Site.

10.2.3.6 Vegetation Communities and Habitat Structures

The site contains very little in the way of vegetation communities or habitat structures that provide habitat for anadromous fish. The Sammamish River within the Action Area is essentially an artificially created and maintained system. The river was dredged and diked in the past, which removed all habitat structures and severely altered the natural vegetative community along the river banks. The current vegetative community within the Action Area consists predominantly of reed canarygrass and non-native invasive blackberries. There have

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been some attempts by the City of Woodinville to remove the invasive species and replant the river bank with natural shrub species, such as willow.

The proposed project will remove non-native blackberries between the OHWM of the Sammamish River and the edge of development. After removal of non-native blackberries, the area between the OHWM of the Sammamish River and the edge of development will be planted with a variety of native shrub species suitable for use along streambanks. The net affect will be to increase the general quality of fish and wildlife habitat along the Sammamish River adjacent to the Site.

10.2.3.7 Water Quality

Water quality of the Sammamish River within the Action Area is affected by the general lack of overhanging streamside vegetation that can help shield the water from insolation and high water temperatures. It is also affected by contaminants from stormwater runoff, agricultural practices in the vicinity of the river, and various levels of urban development.

Water quality will be maintained through onsite treatment and filtration. The project proposes to utilize a filter strip along the edge of the development adjacent to the Sammamish River to filter, treat, and direct stormwater runoff from a portion of the parking lot prior to discharge into the Sammamish River. This filter strip has been designed in accordance with the general water quality maintenance standards of the King County Stormwater Manual (2010).

In addition to the proposed filter strip, a larger wet pond and wetland treatment area will be created to treat and discharge stormwater runoff from the remainder of the Site. As with the proposed filter strip, the treatment pond and wetland area will be designed in accordance with the general water quality maintenance standards of the King County Stormwater Manual (2010).

The discharge of stormwater from the proposed site will meet or exceed currently accepted standards and will not adversely affect the quality of water within the Sammamish River adjacent to the Site.

10.2.3.8 Water Quantity, Including Flood and Low Flow Depths, Volumes, and Velocities

Detention of stormwater is not a requirement for projects adjacent to the Sammamish River. However, maintenance of flood plain capacity, maintenance of water levels, velocities, and volumes is a requirement.

A portion of an existing ditch that currently discharges stormwater into the Sammamish River will be filled as a result of the proposed site development. Approximately 3,740 cu. ft. of floodplain will be filled. The project will mitigate for this filling of the floodplain through creation of an additional ditch area contiguous with that portion of the stormwater ditch to remain. This additional ditch area will be approximately 5,430 cu. ft .in size (the amount of available floodplain <u>will not</u> decrease). This additional ditch area will be designed so that fish stranding after flooding events will not be possible.

Water discharged from the Site will not be increased above existing conditions (the quantity and rate of discharge will not change from currently existing values). There will be no effect on water quantity, flood storage, flow depths, volumes, and velocities resulting from the proposed development.

10.2.3.9 Channel's Planform Pattern and Migration Processes

The Sammamish River within the Action Area has been confined to a relatively narrow area by past dredging and levee construction. The channel, itself, is relatively deep with a somewhat rounded bottom. The channel has been cut off from its historic flood plain and is prevented from migrating by the levees.

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The proposed project will not alter the planform pattern of the Sammamish River or change the existing migration process.

10.2.3.10 Spawning Substrate, if applicable

The Sammamish River within the Action Area generally does not provide any substrate suitable for spawning by anadromous fish. The proposed development will not alter the existing substrate in any way, either by addition of spawning gravels or removal.

10.2.3.11 Floodplain Refugia, if applicable

The Sammamish River has been cut off from its floodplain by levees and provides no refugia for salmonids during flood events. The proposed project will not remove or create additional refugia.

10.2.4 Indirect Effects

The Floodplain Habitat Assessment and Mitigation Draft Regional Guidance outlines eight items of indirect effects that could occur as a result of project impacts. These are, but are not limited to:

- Disrupting high or low stream flow, including impacts from stormwater runoff;
- Contributing to sedimentation that fills in substrate;
- Blocking a corridor that connects habitat areas;
- Increases in water body temperature and other water quality parameters through removal of riparian vegetation;
- Disturbance of riparian vegetation (for example, clearing vegetation to the edge of a forested riparian area);
- Moving or removing large woody debris;
- Destabilizing banks and modifying channel migration processes; and,
- Modifying wetland areas through disturbance of adjacent vegetation or modification of hydrology.

While indirect effects are possible resulting from the proposed project, the effects to salmonid habitat are anticipated to be negligible. This is based on existing site conditions and the proposed mitigation for site impacts. Each item will be discussed in the following list.

- Disrupting high or low stream flow, including impacts from stormwater runoff;

  There will be no work done within the Sammamish River Channel from the proposed project. This includes any work that could alter the river channel morphology leading to changes in flow. Additionally, there will be no increase in the amount of stormwater discharge resulting from the proposed site development. Currently, the Site is nearly 100 percent impervious surfaces. The actual amount of impervious surfaces will likely decrease by a small amount resulting from the proposed redevelopment. Available onsite treatment of stormwater will be greater than currently existing on the Site. Stormwater detention is not required for this project. However, the proposed biofilter strip and wetland storm pond will likely provide greater latency of stormwater on the property than exists under current development.

- Contributing to sedimentation that fills in substrate;

  The proposed biofilter strip and wetland storm pond proposed under the redevelopment concept will provide greater removal of sediments than currently exists on the Site. The proposed project will not likely contribute to increased sedimentation in the Sammamish River.

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- Blocking a corridor that connects habitat areas;

  There are two aspects to this item. One is blocking the migration pathway of anadromous fish to other spawning and rearing sites. The other is blocking access to the Sammamish River by other wildlife that utilize the river for habitat.

  There is no work proposed that will alter the stream morphology or otherwise present an impediment for anadromous fish migration to or from spawning and rearing habitat. The existing morphology of the Sammamish River will be maintained.

  There is currently no connectivity between the river and other upland habitats that crosses the Site. Connectivity along the riparian buffer of the Sammamish River will not be altered in any manner that could impede the movement of wildlife.

- Increases in water body temperature and other water quality parameters through removal of riparian vegetation;

  The current riparian vegetation does not provide any appreciable shading to the Sammamish River. The proposed project will remove non-native blackberries from the OHWM to the buffer edge and will replace these with native shrubs suitable for use in riparian buffers. Over time, these shrubs may provide some additional cooling to the Sammamish River. Other water quality parameters provided by riparian vegetation will not be reduced by the proposed project.

- Disturbance of riparian vegetation (for example, clearing vegetation to the edge of a forested riparian area);

  The current riparian vegetation will be disturbed from the OHWM to the buffer edge under the current proposed development. This vegetation consists predominantly of non-native blackberries and reed canarygrass. The proposed development plan will replace the non-native blackberries with native shrub species suitable for use in riparian buffers (willows, roses, etc.). Disturbance of riparian vegetation will be a temporary impact, but the quality of the habitat will likely be greater compared to existing conditions.

- Moving or removing large woody debris;

  there are currently no pieces of large woody debris within the riparian buffer or within the Sammamish River channel, itself. Therefore, there will be no indirect impacts to the Sammamish River from moving or removing large woody debris.

- Destabilizing banks and modifying channel migration processes;

  the levee adjacent to the Site will not be destabilized. An additional ditch will be created contiguous with an existing ditch that will act as compensation for loss of floodplain capacity stemming from site development. This compensatory flood storage will be armored and vegetated to prevent unstable bank or levee conditions. Because the Sammamish River is confined within levees and the levees will not be significantly changed, there will be no modification of channel migration processes from current conditions.

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and,

- Modifying wetland areas through disturbance of adjacent vegetation or modification of hydrology.

  There are no wetland areas on the project site. The Site is nearly 100 percent impervious surfaces with stormwater discharged either directly to the Sammamish River or through an existing bioswale. The proposed project will provide greater stormwater treatment than currently existing on the Site, but will not significantly alter existing Site hydrology.

10.2.5 Interdependent and Interrelated Actions

There should be no long-term adverse indirect effects resulting from the proposed development. Indirect effects potentially resulting from this project include beneficial changes to water quality, water cooling, and localized increase in habitat functions and values. Other potential beneficial long-term effects include an increased reservoir of organic material input (small and large woody material, leaves, etc.).

10.2.6 Cumulative Impacts

The current use of the property is commercial-industrial. A large portion of the property, including significant portions of required buffers and shoreline setbacks, is developed with impervious surfaces. Industrial uses include lumber storage and lumber products manufacturing.

The proposed redevelopment of the property will not increase the area of impermeable surfaces (the area of impermeable surfaces will actually decrease) and will not include lumber products manufacturing activities.

Other activities unrelated to the project, but may occur in the Action Area include manufacturing or light industrial uses, warehouse and commercial activities, agriculture, and residential development. It is unlikely that any additional development will occur on the left bank of the Sammamish River. It is likely that the agricultural uses along the right bank of the river will not be a viable economic use in the future. This land use may be replaced by other uses (residential, recreational, etc.). These types of impacts will increase the human-made impacts to the Sammamish River and could impact Federally- and State-listed threatened or endangered species.

CHAPTER 11. DETERMINATION OF EFFECTS

The essence of an effects determination is to evaluate a proposed action on a listed species, or “take.” Take is defined by Section 3 of the Endangered Species Act as “to harass, harm, pursue, hunt, shoot, would, trap, capture, collect, or attempt to engage in any such conduct. The US Fish and Wildlife Service further defines “harm” as “significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. The USFWS further defines “harass” as “actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns, which include, but are not limited to. Breeding, feeding, or sheltering.”

The different effects determinations possible for a proposed project are: no effect, may affect, but is not likely to adversely affect, may adversely affect, and likely to adversely affect. A “no effect” determination states that the proposed project will in no way affect the listed species. This determination is appropriate for cases where it can be conclusively shown that nothing occurring within the action area will alter the viability of a listed species, or that a listed species

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is not within the watershed, or that critical habitat for a species is not included within the action area. Failing that level of connection, the proposed action must be determined to affect a listed species. This is not always a bad thing. An action may improve habitat quality for a listed species. This is still an effect. For those instances where a positive effect will occur, or that a negative effect will result in a negligible probability of a take of a listed species, the determination must be "may affect, but is not likely to adversely affect." For actions that create conditions where there is more than a negligible probability of a take of a listed species, the determination must be "likely to adversely affect."

11.1 Puget Sound Fall Chinook Salmon

Puget Sound Fall chinook utilize the Sammamish River within the action area for rearing and migration. We anticipate that the proposed project will not affect the ability for chinook salmon to migrate or rear in the Sammamish River in any demonstrable way. It is expected that the proposed action ***may affect,*** but is ***not likely to adversely affect (NLAA)*** Puget Sound Fall chinook salmon.

11.2 Puget Sound Coho Salmon

Puget Sound coho salmon are known to utilize the Sammamish River for migration and rearing. We anticipate that the proposed project will not alter the habitat conditions in any demonstrable way that would negatively affect the ability of coho salmon to rear or migrate in either the Sammamish River or Mill Creek. It is expected that the proposed action ***may affect,*** but is ***not likely to adversely affect (NLAA)*** Puget Sound coho salmon in the Sammamish River or in Mill Creek.

11.3 Puget Sound Steelhead

Puget Sound steelhead are known to utilize the Sammamish River for migration. We anticipate that the proposed project will not alter the habitat conditions in any demonstrable way that would negatively affect the ability of steelhead to rear or migrate in either the Sammamish River or Mill Creek. It is expected that the proposed action ***may affect,*** but is ***not likely to adversely affect (NLAA)*** Puget Sound steelhead in the Sammamish River or in Mill Creek.

11.4 Bull Trout

Bull trout are known to utilize the Sammamish River for migration. The Sammamish River provides little habitat for bull trout foraging, rearing, or spawning. We anticipate that the proposed project will not affect the ability of bull trout to migrate through the action area in the Sammamish River. It is expected that the proposed action ***may affect***, but is ***not likely to adversely affect (NLAA)*** bull trout in the Sammamish River.

CHAPTER 12. PROPOSED MITIGATION

12.1 Mitigation Measures

Mitigation for the impacts listed above will provide a vastly improved stream buffer condition over the currently degraded buffer on the Site (see mitigation plan sheets, **Appendix B**). A total of 95,720 square feet (sf) of enhanced and/or re-established buffer will be provided with this development proposal. The following sections describe the proposed mitigation.

12.1.1 Stream Buffer Re-establishment

Buffer re-establishment is defined in the Department of Ecology manual, *Wetland Mitigation in Washington State* (DOE, 2006) as the manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural or historic functions to a former buffer area. The project proposes re-establishing approximately 21,420 sf of existing impervious surface to a functioning stream buffer (**Sheet W1.1**). The re-establishment of the existing impervious surfaces to native vegetated buffer area will increase the total vegetated stream

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buffer to a width that is greater than existing conditions. The re-establishment measures will include:

- Removal of the existing asphalt paved areas, including parking, storage areas, and drive isles,
- Removal of all buildings and sidewalks,
- Removal of non-native/invasive species,
- Soil decompaction in the areas of removed asphalt and buildings,
- Providing soil amendments or imported topsoil as necessary,
- Installation of habitat features (e.g., snags with swallow nest boxes and large woody debris (LWD) such as down logs and stumps),
- Placement of 3-inches of bark mulch, and
- Revegetation with a wide variety of native evergreen and deciduous trees, shrubs and groundcovers.

12.1.2 Stream Buffer Enhancement

To mitigate for reducing the 150-foot stream buffer to 100 feet, the project will enhance 74,300 sf of degraded buffer. Enhancement measures will include:

- Clearing and grubbing of non-native/invasive species in the buffer above the OHWM,
- Providing soil amendments or imported topsoil as necessary in all cleared and grubbed areas,
- Installation of habitat features (e.g., snags with swallow nest boxes and large woody debris (LWD) such as down logs and stumps),
- Placement of 3 inches of bark mulch around new plantings, and
- Enhancement of existing vegetation by planting native trees, shrubs, and groundcovers in all cleared and grubbed areas.

These enhancement measures will provide an increase in the functions and values of the buffer over existing conditions.

12.1.3 Critical Area Fencing and Signs

Following construction completion, a split-rail fence (or similar type) will be installed along the entire buffer boundary. Where shoreline viewpoints are located in the buffer, split-rail fencing will also be installed around the viewpoints and associated access paths to deter pedestrian intrusion into the buffer areas.

Per WMC §21.24.160(2): The boundary between a critical area tract and contiguous land shall be identified with permanent signs. Per Section Three of the City of Woodinville *Wetland and Stream Mitigation Guidelines, Part 1 – Design Guidelines, Section 4.0 – Structures, 4.2: "Critical Area Signs shall be mounted on posts set into the ground at 100' intervals or 1 per lot for smaller lots".*

12.1.4 Floodplain Storage Replacement

To mitigate for the loss of floodplain volume, the existing grass-lined swale located at the toe of the landward side of the existing levee will be graded deeper and wider to replace the 3,740 cf of floodplain storage lost due to construction impacts. Approximately 5,430 cf of replacement flood storage volume will be provided, which will significantly exceed the minimum needed to compensate for the lost flood storage volume. All re-graded swale areas will be restored with native vegetation. The bottom of the swale will be seeded and stabilized per the engineering plans, and the side slopes of the swale will be planted with native shrubs per the buffer mitigation plans.

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CHAPTER 13. SUMMARY

Panattoni Development Company proposes to redevelop the Woodinville Lumber property. The project site is located directly adjacent to the Sammamish River, a Shoreline of the State, and as such development on the Site must follow the regulations of Woodinville's Shoreline Master Program, in addition to all other applicable codes and development regulations. The proposed project consists of two speculative warehouse buildings with a combined footprint of about 199,700 square feet (sf) with a future second floor area totaling approximately 30,000 sf. Parking will be developed for approximately 200 cars. Portions of the proposed building, along with paved parking and loading areas, will be located within the Urban Conservancy shoreline environment (the outer 100 feet) of the 200-foot shoreline zone. These uses are permitted in the Urban Conservancy shoreline environment per Woodinville's SMP. No development will occur within the Conservancy shoreline environment (the inner, or waterward 100 feet) of the 200-foot shoreline zone.

The site will be fully developed in a single phase including offsite improvement along Woodinville Redmond road (SR-202) and driveway improvement inside a vested access across the King County Park property from the public street. Two short paths accessing two shoreline viewpoints will be constructed within the stream buffer to provide shoreline access per the requirements of Woodinville's Shoreline Management Plan.

The project proposes to reduce the on-site portion of the Sammamish River buffer from the 150-foot standard buffer to a reduced 100-foot minimum buffer per WMC §21.24.380(1)(a). A small portion of the FEMA 100-year floodplain will be filled to accommodate construction of the proposed parking lot.

Although critical areas were identified off-site to the west of the proposed project, the project in this vicinity is confined to the existing paved roadway on the west side of SR-202. As a result, there will be no impacts to these off-site critical areas or their buffers, which would end at the paved roadway.

Mitigation for the impacts listed above will provide a vastly improved condition for the Sammamish River buffer, which is currently degraded and partially developed. The project has been designed to actually increase the overall area of functioning river buffer on site vs. existing conditions, and the project proposes re-establishing approximately 21,420 sf of existing impervious surface to functioning vegetated buffer. To mitigate for reducing the 150-foot standard Sammamish River buffer to 100 feet, the project will enhance 74,300 sf of existing vegetated but degraded buffer. A total of 95,720 square feet (sf) of enhanced and re-established buffer will be provided with this development proposal. Mitigation for the loss of floodplain volume will be provided with a net increase of 1,690 cf.

The potential of the site to provide critical habitat required by Federally-listed species of fish was evaluated. This evaluation included an analysis of the potential for the proposed project to affect critical habitat. The analysis concluded that the reach of the Sammamish River within the Action Area provides little to no potential spawning or rearing habitat for anadromous fish. The river did have value as a corridor between tributaries with suitable spawning and rearing habitat and the open ocean. It was determined that for all parameters evaluated, the project ***may affect, but is not likely to adversely affect*** any of the listed threatened or endangered fish species known to utilize the Sammamish River.

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CHAPTER 14. REFERENCES

ESA Adolfson. 2009. *City of Woodinville Shoreline Master Program.*

Federal Emergency Management Agency. 2012. *Floodplain Management and the Endangered Species Act: A Model Ordinance.* 79 pp.

Federal Emergency Management Agency. 2011. *Regional Guidance for Floodplain Habitat Assessment and Mitigation.* 33 pp

Hitchcock, C.L., and A. Cronquist. 1973. *Flora of the Pacific Northwest*. University of Washington Press. 730 pp.

Iowa State University. 1995. Hydric Soils of Washington State. U.S. Department of Agriculture, Natural Resources Conservation Service.

King County GIS database (King County, 2006);

Munsell Color. 1988. *Munsell Soil Color Charts*. Kollmorgen Instruments Corp., Baltimore, Maryland.

Natural Resources Conservation Service. 2006. National Technical Committee for Hydric Soils. 2006 List [Online]. Accessed June 12, 2006. <www.soils.usda.gov/use/hydric/ntchs/>

National Oceanic and Atmospheric Administration. *Making Endangered Spcies Act Determination of Effect for Individual or Grouped Actions at the Watershed Scale.* August 1996.

National Oceanic and Atmospheric Administration. *Endangered and Threatened Species; Threatened Status for Three Chinook Salmon Evolutionarily Significant Units in Washington and Oregon, and Endangered Status of One chinook Salmon ESU in Washington. Federal Register* 64, no. 53 (1999): 14308-14328.

National Oceanic and Atmospheric Administration. *Endangered and Threatened Species; Establishment of Species of Concern List, Addition of Species to Species of Concern List, Description of Factors for Identifying Species of Concern, and Revision of Candidate Species List under the Endangered Species Act*. *Federal Register* 69, no. 73 (2004): 19976-19979.

National Marine Fisheries Service (NMFS). 2011. *Current Pacific Coast Salmon Species Listed as Protected Under the Federal Endangered Species Act.* <www.nwr.noaa.gov/ESA-Salmon-Listings> (accessed online June 2012, updated August 11, 2011).

National Oceanic and Atmospheric Administration. *Endangered Species Act – Section 7 Consultation Final Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the On-going National Flood Insurance Program carried out in the Puget Sound Area in Washington State. HUC 17110020 Puget Sound.* NMFS Tracking Number 2006-00472. 22 September 2008.

Rieman, Bruce E., and John D. McIntyre. *Demographic and Habitat Requirements for Conservation of Bull Trout.* Gen. Tech. Rep. INT-302, Intermountain Research Station, Ogden, UT: U.S. Department of Agriculture, 1993, 38.

Shared Strategy Development Committee. *Puget Sound Salmon Recovery Plan, Volume I.* Seattle, WA: Shared Strategy Development Committee, 2007, 503.

Reed, P.B. Jr. 1988. *National List of Plant Species that Occur in Wetlands: Northwest* (Region 9). USF&WS Biol. Report 88.

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Reed, P.B. Jr. 1993. *Supplement to: National List of Plant Species that Occur in Wetlands: Northwest* (Region 9). USF&WS Biol. Report 88.

Reed, P.B. Jr. 1998. *National List of Plant Species that Occur in Wetlands: Northwest* (Region 9). USF&WS Update.

Soil Survey Staff, Natural Resources Conservation Service, U.S. Department of Agriculture, *Web Soil Survey*. [accessed 5-2-12] <http://websoilsurvey.nrcs.usda.gov/>

StreamNet, *StreamNet Mapper,* [online], Portland, OR: StreamNet, [accessed 5-12-2012]. <http://map.streamnet.org/website/bluesnetmapper/viewer.htm>

U.S. Fish and Wildlife Service. *Bull Trout (Salvelinus confluentus) 5-Year Review: Summary and Evaluation.* Portland, OR: Department of the Interior, 2004.

U.S. Fish and Wildlife Service. *Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for Bull Trout in the Coterminous United States. Federal Register* 64, no. 210 (1999): 58910-58933.

U.S. Fish and Wildlife Service. *Endangered and Threatened Wildlife and Plants; Revised Designation of Critical Habitat for Bull Trout in the Coterminous United States. Federal Register* 75, no. 200 (2010): 63898-64070.U.S. Department of Agriculture, Soil Conservation Service. June, 1991. *Hydric Soils of the United States*.

U.S. Fish and Wildlife Service. May 2008. *National Wetlands Inventory Map*. U.S. Department of the Interior, Fish and Wildlife Service, Washington D.C. [accessed 5-2-12] <http://www.fws.gov/nwi/>

Washington State Department of Fish and Wildlife. 2012. *SalmonScape* [online], Olympia, WA: [accessed 5-2-2012]. <http//wdfw.wa.gov/mapping/salmonscape/index.html>

Washington State Department of Fish and Wildlife. 2012. *Priority Habitats and Species Database* [online], Olympia, WA. [accessed June 2012]. <www.wdfw.wa.gov/mapping/phs/>

Washington State Department of Fish and Wildlife. 2011. *Priority Habitat and Species List.* Olympia, WA. 177 pp.

Washington State Natural Heritage Program. 2012. *Natural Heritage Program Database Report.* Olympia, Washington.

Weitkamp, Laurie A., et al. *Status Review of Coho Salmon from Washington, Oregon, and California.* U.S. Department of Commerce, 1995.

Williams, R W, R M Laramie, and J J Ames. *A Catalog of Washington Streams and Salmon Utilization. Volume 1, Puget Sound Region.* Olympia, Washington: Washington Department of Fisheries, 1975.

Woodinville Municipal Code, February 2013, Chapter 21.24 – Development Standards – Critical Areas

Woodinville, City of, *Wetland and Stream Mitigation Guidelines*, April 30, 2007.

Wydoski, Richard S, and Richard R Whitney. *Inland Fishes of Washington.* Seattle: University of Washington Press, 1979.

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FIGURES

Figure 1: Vicinity Map and Driving Directions
Figure 2: Site Map
Figure 3: Urban Conservancy Map
Figure 4: ½ Mile Action Area Map
Figure 5: National Wetlands Inventory Map
Figure 6: King County Critical Areas Map

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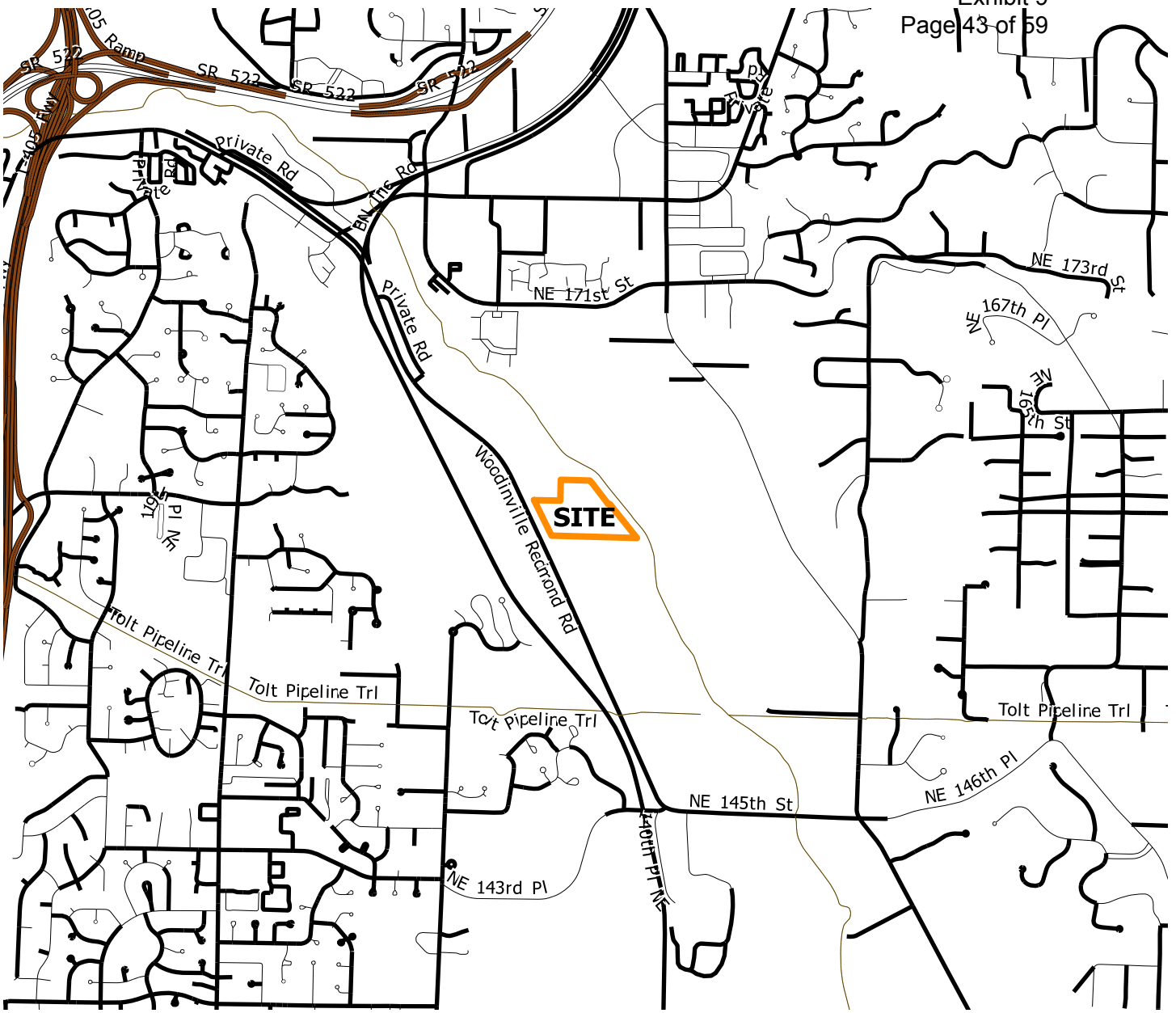

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Driving Directions:
From I-405, take SR-522 east. Exit on 132nd Avenue NE. Turn right (south) and travel ~1/4 mile to NE 175th Street. Turn right (west) and travel ~1/4 mile to Woodinville-Redmond Road. Turn left (south) and travel ~3/4 miles to 15900 Woodinville-Redmond Road. Site is on left (east) side of road.

Reference: Road and stream data from King County GIS, acquired 2006. Site outline based on King County parcel data, acquired 2006.

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FIGURE 1

VICINITY MAP & DRIVING DIRECTIONS
THE RESERVE AT WOODINVILLE
WOODINVILLE, WASHINGTON

DESIGN	DRAWN	PROJECT
	DRT	1349D

SCALE 1 in : 2000 ft

DATE 13 JAN 2016

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Reference: Aerial photograph from NAIP, 2009 (downloaded 2010). Site outline based on King County parcel data, acquired 2006. Road and waterbody GIS data from King County GIS, acquired 2006.

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FIGURE 2

EXISTING CONDITIONS MAP
THE RESERVE AT WOODINVILLE
WOODINVILLE, WASHINGTON

DESIGN	DRAWN	PROJECT
	DRT	1349D

SCALE
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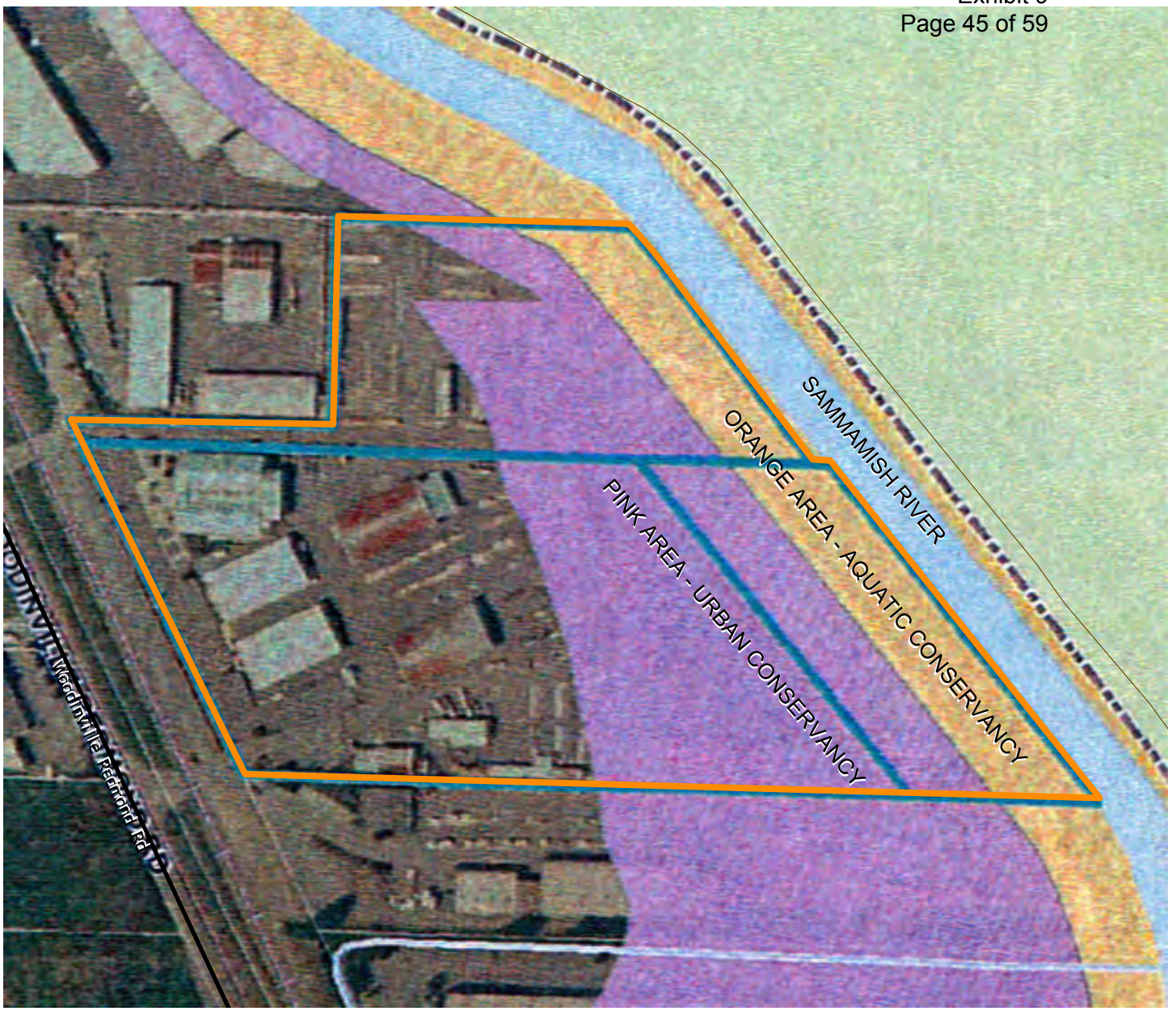

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Reference: Urban Conservancy image scan from City of Woodinville.

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FIGURE 3

CITY OF WOODINVILLE SMP
URBAN CONSERVANCY MAP
THE RESERVE AT WOODINVILLE
WOODINVILLE, WASHINGTON

DESIGN	DRAWN	PROJECT
	DRT	1349D

SCALE 1 in : 200 ft

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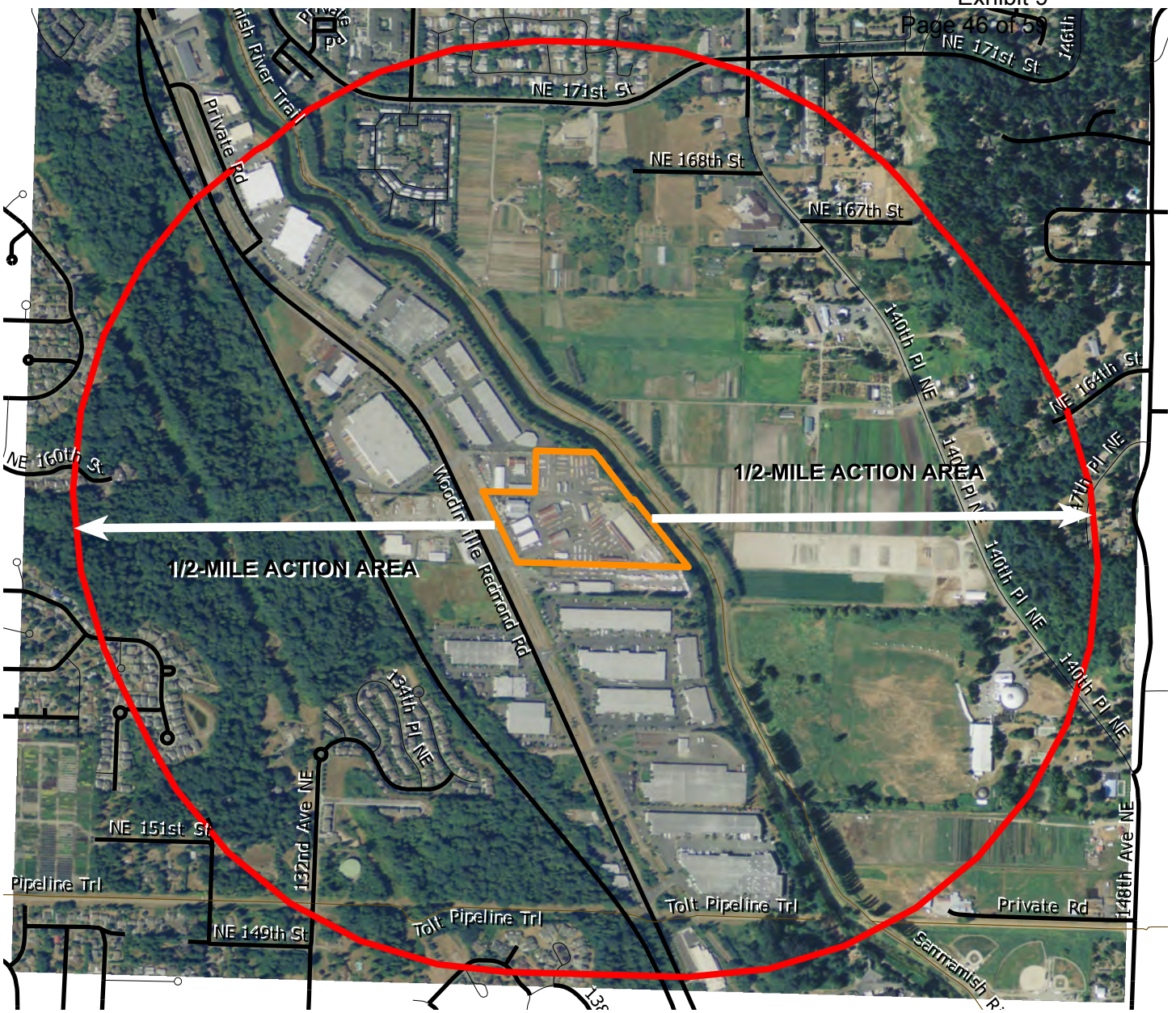

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Reference: Road and parce data from King County GIS, acquired 2006.
Aerial photo from NAIP (downloaded 2010).

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FIGURE 4

CITY OF WOODINVILLE SMP
1/2 MILE ACTION AREA
THE RESERVE AT WOODINVILLE
WOODINVILLE, WASHINGTON

DESIGN	DRAWN	PROJECT
	DRT	1349D

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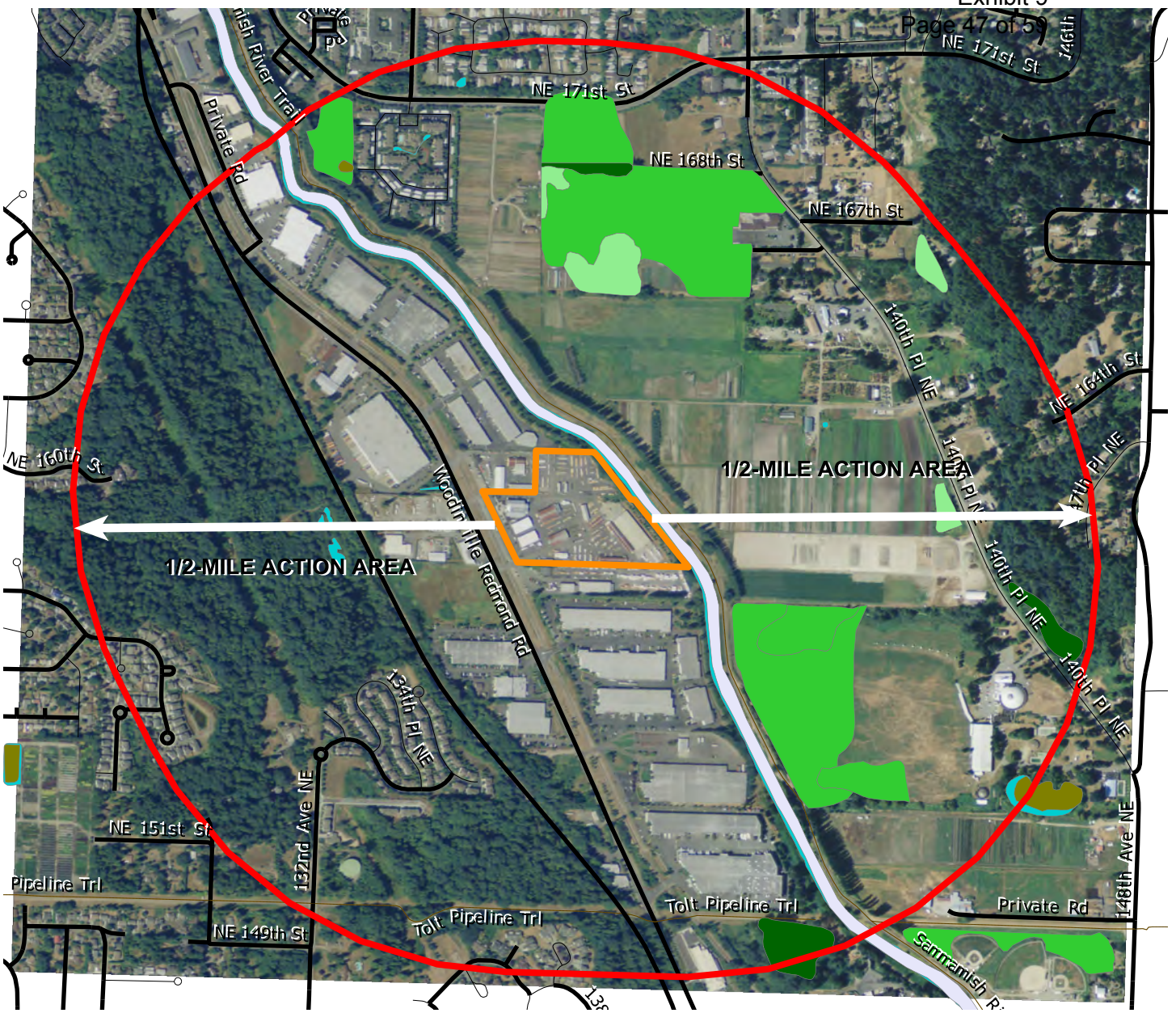

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LEGEND

- Palustrine emergent
- Palustrine scrub-shrub
- Palustrine unconsolidated bottom
- Riparian

Reference: Road and parcel data from King County GIS, acquired 2006. Aerial photo from NAIP (downloaded 2010). National Wetlands Inventory GIS from USFWS, downloaded 2009.

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FIGURE 5

CITY OF WOODINVILLE SMP
NWI WETLAND INVENTORY
THE RESERVE AT WOODINVILLE
WOODINVILLE, WASHINGTON

DESIGN	DRAWN	PROJECT
	DRT	1349D

SCALE 1 in : 1000 ft

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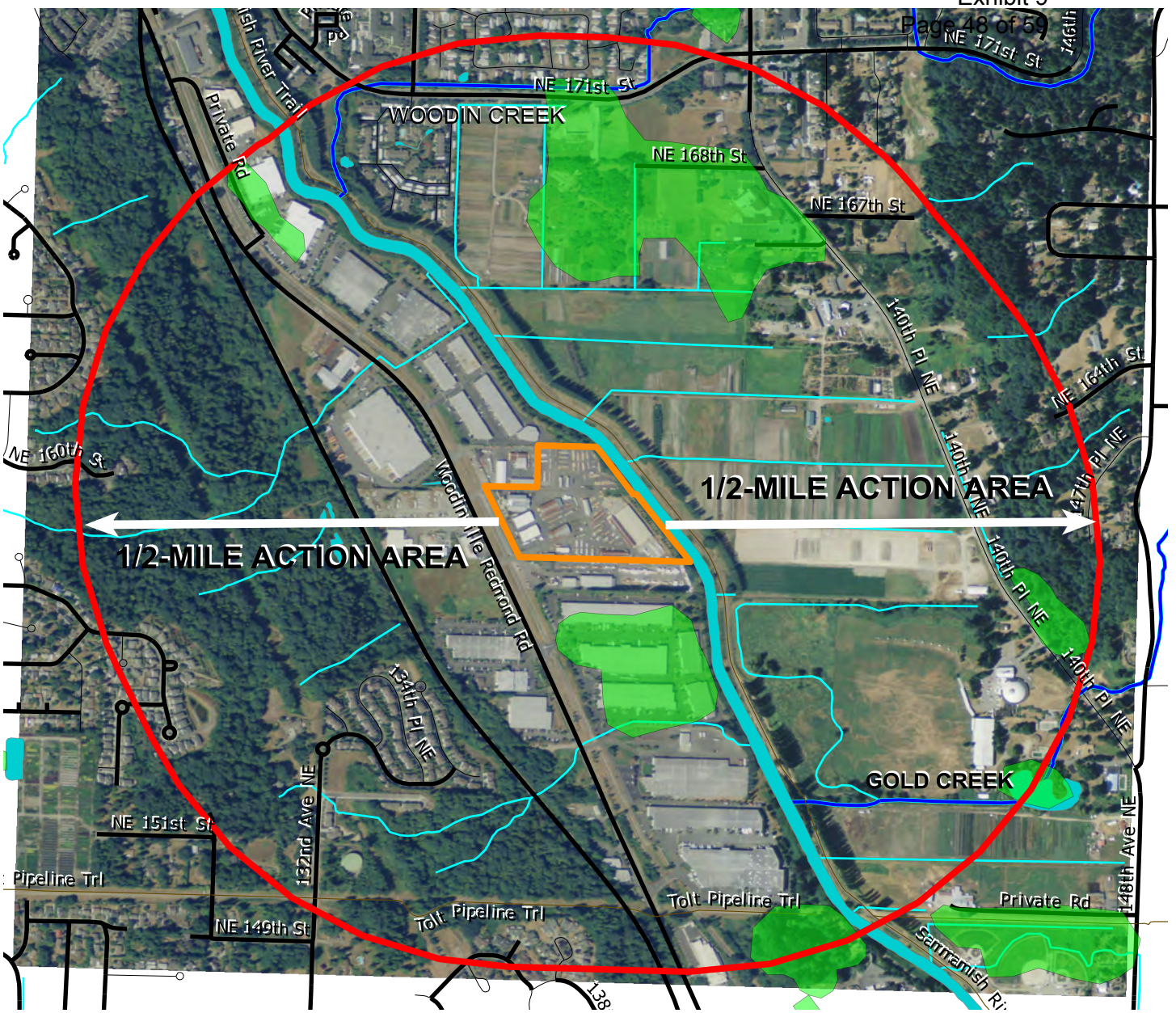

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Reference: Road, parcel, wetland, and stream data from King County GIS, acquired 2006. Aerial photo from NAIP 2009 (downloaded 2010). Named streams are dark blue. Unnamed drainages are light blue. King County SAO wetlands are in light green.

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FIGURE 6

CITY OF WOODINVILLE SMP
KING COUNTY CRITICAL AREAS MAP
THE RESERVE AT WOODINVILLE
WOODINVILLE, WASHINGTON

DESIGN	DRAWN	PROJECT
	DRT	1349D

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APPENDIX A

FEMA Letter of Map Amendment (LOMA) dated 10 January 2012

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Page 1 of 3		Date: January 10, 2012	Case No.: 11-10-1973A	LOMA

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP AMENDMENT DETERMINATION DOCUMENT (REMOVAL)

COMMUNITY AND MAP PANEL INFORMATION		LEGAL PROPERTY DESCRIPTION
COMMUNITY	CITY OF WOODINVILLE, KING COUNTY, WASHINGTON	A parcel of land, as described in the Statutory Warranty Deed, recorded as Document No. 20020509001041, in the Office of the Auditor, King County, Washington The portion of property is more particularly described by the following metes and bounds:
	COMMUNITY NO.: 530324	
AFFECTED MAP PANEL	NUMBER: 53033C0360G	
	DATE: 11/8/1999	
FLOODING SOURCE: SAMMAMISH RIVER		APPROXIMATE LATITUDE & LONGITUDE OF PROPERTY: 47.743, -122.157 SOURCE OF LAT & LONG: STREETS & TRIPS 2009 DATUM: WGS 84

DETERMINATION

LOT	BLOCK/ SECTION	SUBDIVISION	STREET	OUTCOME WHAT IS REMOVED FROM THE SFHA	FLOOD ZONE	1% ANNUAL CHANCE FLOOD ELEVATION (NGVD 29)	LOWEST ADJACENT GRADE ELEVATION (NGVD 29)	LOWEST LOT ELEVATION (NGVD 29)
--	--	--	15900 Woodinville Redmond Road	Portion of Property	X (shaded)	25.4 feet	--	25.4 feet

Special Flood Hazard Area (SFHA) - The SFHA is an area that would be inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood).

ADDITIONAL CONSIDERATIONS (Please refer to the appropriate section on Attachment 1 for the additional considerations listed below.)

LEGAL PROPERTY DESCRIPTION
PORTIONS REMAIN IN THE FLOODWAY
STUDY UNDERWAY

This document provides the Federal Emergency Management Agency's determination regarding a request for a Letter of Map Amendment for the property described above. Using the information submitted and the effective National Flood Insurance Program (NFIP) map, we have determined that the described portion(s) of the property(ies) is/are not located in the SFHA, an area inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood). This document amends the effective NFIP map to remove the subject property from the SFHA located on the effective NFIP map; therefore, the Federal mandatory flood insurance requirement does not apply. However, the lender has the option to continue the flood insurance requirement to protect its financial risk on the loan. A Preferred Risk Policy (PRP) is available for buildings located outside the SFHA. Information about the PRP and how one can apply is enclosed.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at (877) 336-2627 (877-FEMA MAP) or by letter addressed to the Federal Emergency Management Agency, LOMC Clearinghouse, 6730 Santa Barbara Court, Elkridge, MD 21075.

Luis Rodriguez, P.E., Chief
Engineering Management Branch
Federal Insurance and Mitigation Administration

Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP AMENDMENT
DETERMINATION DOCUMENT (REMOVAL)

ATTACHMENT 1 (ADDITIONAL CONSIDERATIONS)

LEGAL PROPERTY DESCRIPTION (CONTINUED)

COMMENCING at the Southwest corner of that property described in the Statutory Warranty Deed; thence S88°37'46"E, a distance of 1090.00 feet to the POINT OF BEGINNING; thence N35°42'00"W, a distance of 230.00 feet; thence, N41°00'00"W, a distance of 115.00 feet; thence N75°20'00"W, a distance of 15.00 feet; thence N48°00'00"W, a distance of 15.00 feet; thence N04°00'00"E, a distance of 7.50 feet; thence N36°45'00"W, a distance of 180.00 feet; thence S89°00'00"W, a distance of 70.00 feet; thence S36°00'00"E, a distance of 35.00 feet; thence S42°10'00"E, a distance of 37.50 feet; thence S16°00'00"E, a distance of 7.50 feet; thence S43°20'00"E, a distance of 45.00 feet; thence S40°20'00"E, a distance of 140.00 feet; thence S36°30'00"E, a distance of 95.00 feet; thence S36°00'00"E, a distance of 65.00 feet; thence S28°10'00"E, a distance of 35.00 feet; thence N44°10'00"W, a distance of 120.00 feet; thence N16°20'00"W, a distance of 15.00 feet; thence N39°10'00"W, a distance of 220.00 feet; thence N43°40'00"W, a distance of 12.00 feet; thence N36°50'00"W, a distance of 105.00 feet; thence N85°30'00"W, a distance of 85.00 feet; thence N04°00'00"W, a distance of 15.00 feet; thence S88°50'00"E, a distance of 135.00 feet; thence N68°10'00"E, a distance of 24.00 feet; thence N44°00'00"W, a distance of 65.00 feet; thence N33°15'00"W, a distance of 35.00 feet; thence N05°40'00"W, a distance of 10.00 feet; thence N38°37'03"W, a distance of 17.00 feet; thence N85°00'00"W, a distance of 8.00 feet; thence N39°10'00"W, a distance of 18.00 feet; thence S76°45'00"W, a distance of 35.00 feet; thence N85°00'00"W, a distance of 35.00 feet; thence N62°00'00"W, a distance of 15.00 feet; thence N36°50'00"E, a distance of 15.00 feet; thence N84°20'00"E, a distance of 60.00 feet; thence N41°57'00"W, a distance of 184.87 feet; thence N88°37'45"W, a distance of 193.00 feet; thence S56°00'00"E, a distance of 245.00 feet; thence S88°05'00"W, a distance of 300.00 feet; thence S40°45'00"E, a distance of 80.00 feet; thence S30°15'00"E, a distance of 75.00 feet; thence S17°35'00"E, a distance of 125.00 feet; thence S23°00'00"E, a distance of 150.00 feet; thence S11°55'30"E, a distance of 202.00 feet; thence S88°37'46"E, a distance of 652.56 feet to the POINT OF BEGINNING.

This attachment provides additional information regarding this request. If you have any questions about this attachment, please contact the FEMA Map Assistance Center toll free at (877) 336-2627 (877-FEMA MAP) or by letter addressed to the Federal Emergency Management Agency, LOMC Clearinghouse, 6730 Santa Barbara Court, Elkridge, MD 21075.

Luis Rodriguez, P.E., Chief
Engineering Management Branch
Federal Insurance and Mitigation Administration

Page 3 of 3		Date: January 10, 2012	Case No.: 11-10-1973A	LOMA

Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP AMENDMENT
DETERMINATION DOCUMENT (REMOVAL)

ATTACHMENT 1 (ADDITIONAL CONSIDERATIONS)

PORTIONS OF THE PROPERTY REMAIN IN THE FLOODWAY (This Additional Consideration applies to the preceding 1 Property.)

A portion of this property is located within the Special Flood Hazard Area and the National Flood Insurance Program (NFIP) regulatory floodway for the flooding source indicated on the Determination/Comment Document while the subject of this determination is not. The NFIP regulatory floodway is the area that must remain unobstructed in order to prevent unacceptable increases in base flood elevations. Therefore, no construction may take place in an NFIP regulatory floodway that may cause an increase in the base flood elevation, and any future construction or substantial improvement on the property remains subject to Federal, State/Commonwealth, and local regulations for floodplain management. The NFIP regulatory floodway is provided to the community as a tool to regulate floodplain development. Modifications to the NFIP regulatory floodway must be accepted by both the Federal Emergency Management Agency (FEMA) and the community involved. Appropriate community actions are defined in Paragraph 60.3(d) of the NFIP regulations. Any proposed revision to the NFIP regulatory floodway must be submitted to FEMA by community officials. The community should contact either the Regional Director (for those communities in Regions I-IV, and VI-X), or the Regional Engineer (for those communities in Region V) for guidance on the data which must be submitted for a revision to the NFIP regulatory floodway. Contact information for each regional office can be obtained by calling the FEMA Map Assistance Center toll free at (877) 336-2627 (877-FEMA MAP) or from our web site at http://www.fema.gov/about/regoff.htm.

STUDY UNDERWAY (This Additional Consideration applies to all properties in the LOMA DETERMINATION DOCUMENT (REMOVAL))

This determination is based on the flood data presently available. However, the Federal Emergency Management Agency is currently revising the National Flood Insurance Program (NFIP) map for the community. New flood data could be generated that may affect this property. When the new NFIP map is issued it will supersede this determination. The Federal requirement for the purchase of flood insurance will then be based on the newly revised NFIP map.

This attachment provides additional information regarding this request. If you have any questions about this attachment, please contact the FEMA Map Assistance Center toll free at (877) 336-2627 (877-FEMA MAP) or by letter addressed to the Federal Emergency Management Agency, LOMC Clearinghouse, 6730 Santa Barbara Court, Elkridge, MD 21075.

Luis Rodriguez, P.E., Chief
Engineering Management Branch
Federal Insurance and Mitigation Administration

APPENDIX B

Buffer Mitigation Plan

(11”x17” sheets reduced from full-size 24”x36” drawings)

Sheet W1.0: Existing Conditions Plan
Sheet W1.1: Proposed Site Plan, Impacts and Mitigation Overview
Sheet W1.2: Clearing and Grubbing Plan, Notes & Details
Sheet W2.0: Planting Plan, Plant Schedule & Notes
Sheet W2.1: Planting Plan & Details
Sheet W2.2: Planting Specifications

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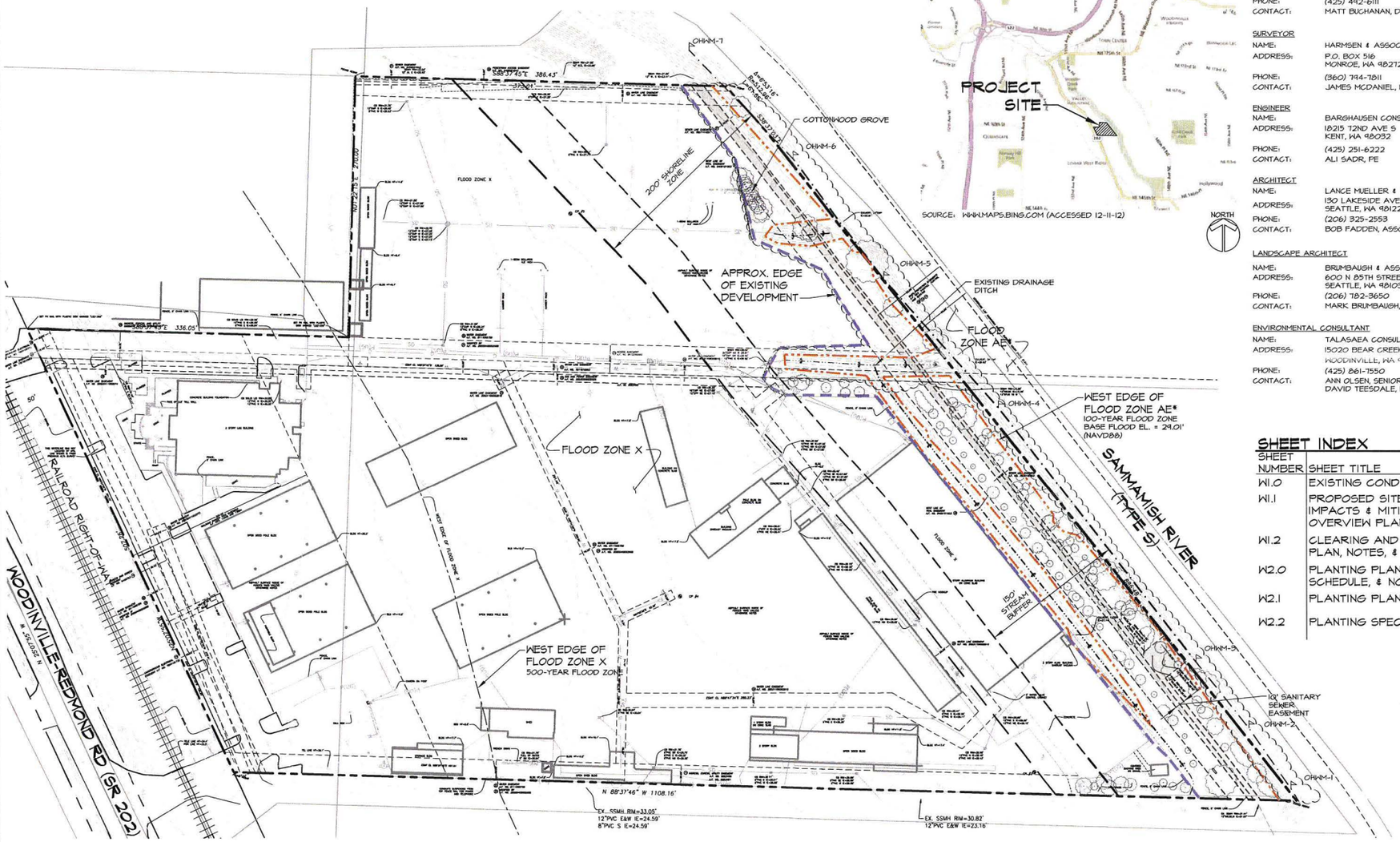
NW 1/4 SEC. 15, TWP. 26 N, RGE. 5 E, W.M.



EXISTING CONDITIONS PLAN

GRAPHIC SCALE (IN FEET) 0 25 50 100 SCALE: 1"=50'

NORTH

PLAN LEGEND

- PROPERTY LINE
- STANDARD STREAM BUFFER
- 200' SHORELINE ZONE BOUNDARY
- STREAM ORDINARY HIGH WATER MARK (OHNM)
- EXISTING DITCH CENTERLINE
- FLOOD ZONE AE BOUNDARY*
- EXISTING CONTOUR
- OHNM-# OHNM FLAG LOCATION
- EXISTING CONIFEROUS/DECIDUOUS TREES
- EXISTING SHRUB VEGETATION
- EXISTING HIMALAYAN/EVERGREEN BLACKBERRY & REED CANARYGRASS
- APPROX. EDGE OF EXISTING DEVELOPMENT

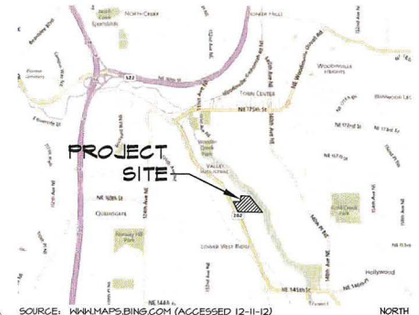
* 100-YEAR FLOOD ZONE NOTE:

THE 100-YEAR FLOOD ZONE BOUNDARY (ZONE AE) HAS BEEN OFFICIALLY REVISED FOR THE PROJECT SITE VIA A LETTER OF MAP AMENDMENT (LOMA) APPROVED BY FEMA. THE NEW 100-YEAR FLOOD BOUNDARY DEFINED IN THE LOMA SUPERSEDES THE BOUNDARY SHOWN ON THE EXISTING FIRM MAP (MAP PANEL # 53033C0360G, DATED 11/8/1999). SEE THE LOMA DOCUMENT DATED 10 JANUARY 2012, FEMA CASE # 11-10-1973A, FOR MORE INFORMATION. THE MODIFIED ZONE AE FLOOD BOUNDARY DEFINED IN THE LOMA APPLIES ONLY TO THE PROJECT SITE. PER THE LOMA, THE BASE FLOOD ELEVATION (BFE) FOR THE PROJECT SITE IS 25.4 FEET BASED ON THE NGVD29 DATUM.

NOTE: EXISTING AND PROPOSED TOPOGRAPHIC INFORMATION SHOWN ON THESE PLANS IS BASED ON THE NAVD88 DATUM, AND THE BASE FLOOD ELEVATION IS 29.01 FEET BASED ON NAVD88.

VICINITY MAP

NTS



SOURCE: WWW.MAPS.BING.COM (ACCESSED 12-11-12)

NORTH

CONTACTS

APPLICANT
NAME: PANATTONI DEVELOPMENT CO. INC.
ADDRESS: 900 SW 16TH STREET SUITE 330 RENTON, WA 98057
PHONE: (425) 492-6111
CONTACT: MATT BUCHANAN, DEVELOPMENT MANAGER

SURVEYOR
NAME: HARMSEN & ASSOCIATES, INC.
ADDRESS: P.O. BOX 516 MONROE, WA 98272
PHONE: (360) 794-7811
CONTACT: JAMES MCDANIEL, PLS

ENGINEER
NAME: BARGHAUSEN CONSULTING ENGINEERS, INC.
ADDRESS: 18215 72ND AVE S KENT, WA 98032
PHONE: (425) 251-6222
CONTACT: ALI SADR, PE

ARCHITECT
NAME: LANCE MUELLER & ASSOCIATES
ADDRESS: 130 LAKESIDE AVE, SUITE 250 SEATTLE, WA 98122
PHONE: (206) 325-2553
CONTACT: BOB FADDEN, ASSOCIATE ARCHITECT

LANDSCAPE ARCHITECT
NAME: BRUMBAUGH & ASSOCIATES
ADDRESS: 600 N 85TH STREET, SUITE 102 SEATTLE, WA 98103
PHONE: (206) 782-3650
CONTACT: MARK BRUMBAUGH, RLA

ENVIRONMENTAL CONSULTANT
NAME: TALASAEA CONSULTANTS, INC.
ADDRESS: 15020 BEAR CREEK RD. NE WOODINVILLE, WA 98077
PHONE: (425) 861-7550
CONTACT: ANN OLSEN, SENIOR PROJECT MANAGER
DAVID TEESDALE, PWS, SENIOR ECOLOGIST

SHEET INDEX

SHEET NUMBER	SHEET TITLE
W1.0	EXISTING CONDITIONS PLAN
W1.1	PROPOSED SITE PLAN, IMPACTS & MITIGATION OVERVIEW PLAN
W1.2	CLEARING AND GRUBBING PLAN, NOTES, & DETAILS
W2.0	PLANTING PLAN, PLANT SCHEDULE, & NOTES
W2.1	PLANTING PLAN & DETAILS
W2.2	PLANTING SPECIFICATIONS

Know what's **below.** **Call** before you dig.

NOTES

1. SURVEY PROVIDED BY HARMSEN & ASSOCIATES, INC., P.O. BOX 516, MONROE, WA 98272; (360) 794-7811
2. SITE PLAN PROVIDED BY BARGHAUSEN CONSULTING ENGINEERS, INC., 18215 72ND AVE S, KENT, WA 98032; (425) 251-6222
3. SOURCE DRAWINGS HAVE BEEN MODIFIED BY TALASAEA CONSULTANTS FOR VISUAL ENHANCEMENT.
4. THIS PLAN IS AN ATTACHMENT TO THE CRITICAL AREAS SPECIAL STUDY REPORT PREPARED BY TALASAEA CONSULTANTS, DATED 15 JANUARY 2016.

TALASAEA CONSULTANTS, INC.
Resource & Environmental Planning
15020 Bear Creek Road Northeast • Woodinville, Washington 98077
Fax (425) 861-7539 • Fax (425) 861-7539

EXHIBIT 9
PAGE 54 OF 59

STREAM BUFFER MITIGATION PLAN
EXISTING CONDITIONS PLAN
THE RESERVE AT WOODINVILLE
WOODINVILLE, WASHINGTON

Revisions	Date	By

Date 1-15-2016
Scale AS NOTED
Designed AO
Drawn ABS
Checked AO
Approved AO

Project #1344D

Sheet # W1.0

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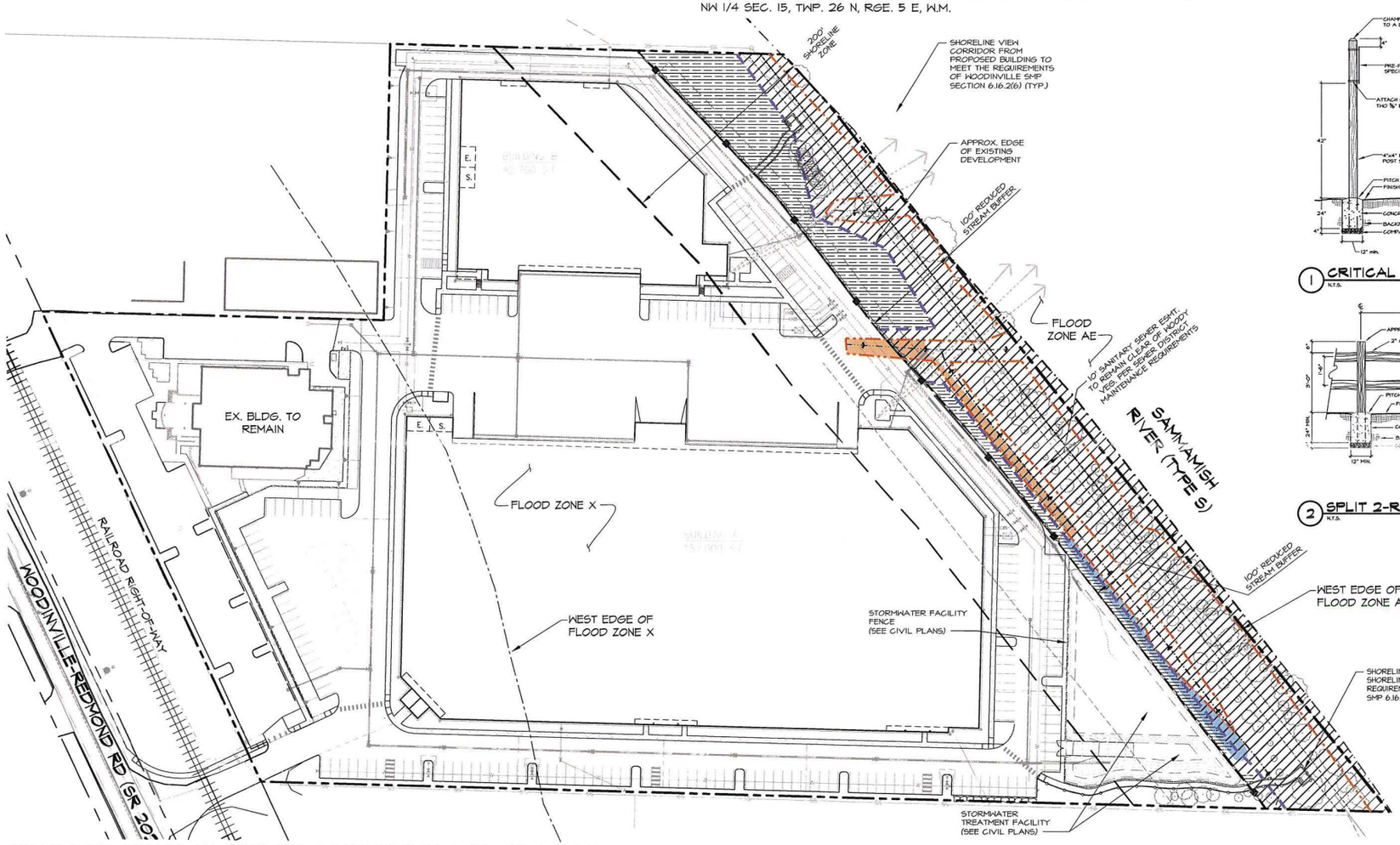
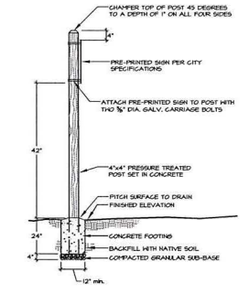
Plotted January 14, 2016

NW 1/4 SEC. 15, TWP. 26 N, RGE. 5 E, W.M.

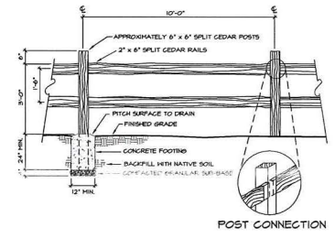


PROPOSED SITE PLAN, IMPACTS & MITIGATION OVERVIEW PLAN

GRAPHIC SCALE (IN FEET) 0 25 50 100
SCALE: 1"=50'
NORTH



1 CRITICAL AREAS SIGN DETAIL
N.T.S.



2 SPLIT 2-RAIL FENCE DETAIL
N.T.S.

IMPACT LEGEND

	FLOOD STORAGE VOLUME REDUCTION WITHIN 100-YEAR FLOODPLAIN (ZONE AE)	± 3,740 CF

MITIGATION LEGEND

	BUFFER RE-ESTABLISHMENT	± 21,420 SF
	BUFFER ENHANCEMENT	± 74,300 SF
	TOTAL BUFFER ENHANCEMENT/RE-ESTABLISHMENT:	± 95,720 SF
	FLOOD STORAGE VOLUME REPLACEMENT PER WMC 21.24.230(1) (EXISTING SHALE WILL BE RE-GRADED TO INCREASE FLOOD STORAGE VOLUME)	± 5,430 CF
◆	CRITICAL AREAS SIGNS PER WMC 21.24.160	
—o—o—	CRITICAL AREA FENCE (SPLIT RAIL OR SIMILAR)	

PLAN LEGEND

- PROPERTY LINE
- REDUCED STREAM BUFFER
- 200' SHORELINE ZONE BOUNDARY
- STREAM ORDINARY HIGH WATER MARK (OHWM)
- EXISTING DITCH CENTERLINE
- FLOOD ZONE AE BOUNDARY
- EXISTING CONIFEROUS/DECIDUOUS TREES TO REMAIN
- EXISTING SHRUB VEGETATION TO REMAIN
- APPROX. EDGE OF EXISTING DEVELOPMENT

Know what's **below.** **Call** before you dig.

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TALASAEA CONSULTANTS, INC.
Resource & Environmental Planning
16500 Bear Creek Road, Northeast • Redmond, Washington 98077
Tel (425) 883-8300 • Fax (425) 883-8301

STREAM BUFFER MITIGATION PLAN
PROPOSED SITE PLAN, IMPACTS & MITIGATION OVERVIEW PLAN
THE RESERVE AT WOODINVILLE
WOODINVILLE, WASHINGTON

EXHIBIT 9
PAGE 55 OF 59

Revisions	Date	By

Date	1-15-2016
Scale	AS NOTED
Designed	AG
Drawn	ABS
Checked	AG
Approved	AG
Project #	13449D
Sheet #	W.1

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Plotted January 15, 2016

NW 1/4 SEC. 15, TWP. 26 N, RGE. 5 E, W.M.

NOTES FOR CLEARING, GRUBBING, AND HABITAT FEATURE INSTALLATION

PART 1: GENERAL

1.1 SEQUENCING

A. GENERAL CONSTRUCTION:

1. CONTRACTOR SHALL GIVE TALASAEA CONSULTANTS A MINIMUM OF TEN (10) DAYS NOTICE PRIOR TO BEGINNING CONSTRUCTION.
2. NO CONSTRUCTION WORK SHALL COMMENCE UNTIL THERE IS A MEETING BETWEEN THE CLIENT, TALASAEA CONSULTANTS, GENERAL, CLEARING, AND/OR EARTHWORK CONTRACTORS, AND THE LANDSCAPE CONTRACTOR. THE APPROVED PLANS AND SPECIFICATIONS SHALL BE REVIEWED TO ENSURE THAT ALL PARTIES INVOLVED UNDERSTAND THE INTENT AND THE SPECIFIC DETAILS RELATED TO THE CONSTRUCTION DOCUMENTS, SPECIFICATIONS AND SITE CONSTRAINTS.
3. LOCATIONS OF EXISTING UTILITIES HAVE BEEN ESTABLISHED BY FIELD SURVEY OR OBTAINED FROM AVAILABLE RECORDS AND SHOULD BE CONSIDERED APPROXIMATE ONLY AND NOT NECESSARILY COMPLETE. IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO: (1) INDEPENDENTLY VERIFY THE ACCURACY OF UTILITY LOCATIONS AND (2) DISCOVER AND AVOID ANY UTILITIES WITHIN THE MITIGATION PLAN AREA(S) THAT ARE NOT SHOWN, BUT WHICH MAY BE AFFECTED BY IMPLEMENTATION OF THE PLAN. SUCH AREA(S) ARE TO BE CLEARLY MARKED IN THE FIELD. TALASAEA CONSULTANTS SHALL REVIEW ANY CONFLICTS WITH THE APPROVED MITIGATION PLAN PRIOR TO START OF CONSTRUCTION.
4. A COPY OF THE APPROVED PLANS MUST BE ON SITE WHENEVER CONSTRUCTION IS IN PROGRESS, AND SHALL REMAIN ON SITE UNTIL PROJECT COMPLETION.
5. CONSTRUCTION MUST BE PERFORMED IN ACCORDANCE WITH ALL AGENCY STANDARDS, RULES, CODES, PERMIT CONDITIONS, AND/OR OTHER APPLICABLE ORDINANCES AND POLICIES.
6. THE PROJECT OWNER/APPLICANT IS RESPONSIBLE FOR OBTAINING ANY OTHER RELATED OR REQUIRED PERMITS PRIOR TO THE START OF CONSTRUCTION.
7. A QUALIFIED ECOLOGIST SHALL BE ON SITE, AS NECESSARY, TO MONITOR MITIGATION CONSTRUCTION AND APPROVE MINOR REVISIONS TO THE PLAN.
8. DURING CONSTRUCTION, THE CONTRACTOR MUST USE MATERIALS AND CONSTRUCTION METHODS THAT PREVENT TOXIC SUBSTANCES AND OTHER POLLUTANTS FROM ENTERING MITIGATION AREAS OR OTHER NATURAL WATERS OF THE STATE.
9. PREVENTATIVE MEASURES SHALL BE USED TO PROTECT EXISTING STORM DRAINAGE SYSTEMS, EXISTING UTILITIES, AND ROADS.
10. THE CONTRACTOR SHALL PROVIDE SEDIMENT AND EROSION CONTROLS AROUND THE PROJECT AREA PRIOR TO SOIL DISTURBANCE FROM CONSTRUCTION ACTIVITY.

B. MITIGATION CONSTRUCTION: THE FOLLOWING PROVIDES THE GENERAL SEQUENCE OF ACTIVITIES ANTICIPATED TO BE NECESSARY TO COMPLETE THIS MITIGATION PROJECT. SOME OF THESE ACTIVITIES MAY BE CONDUCTED CONCURRENTLY AS THE PROJECT PROGRESSES.

1. CONDUCT A SITE MEETING BETWEEN THE CONTRACTOR, TALASAEA CONSULTANTS, AND THE OWNER'S REPRESENTATIVE TO REVIEW THE PROJECT PLANS.
2. SURVEY CLEARING LIMITS.
3. INSTALL SILT FENCE AND ANY OTHER EROSION AND SEDIMENTATION CONTROL BMPS NECESSARY FOR WORK IN THE MITIGATION AREAS.
4. CONSTRUCT PROJECT PER CIVIL PLANS.
5. CLEAR AND GRUB NON-NATIVE/INVASIVE VEGETATION FROM BUFFER
6. AMEND SOIL AND PLACE LARGE WOODY MATERIAL.
7. CONSTRUCT SHORELINE VIEWPOINTS AND ACCESS PATHS WITHIN BUFFER.
8. COMPLETE SITE CLEANUP AND INSTALL PLANT MATERIAL AS INDICATED ON THE BUFFER MITIGATION PLANTING PLAN.
9. INSTALL SPLIT-RAIL FENCE AND CRITICAL AREA SIGNS.

1.2 PROJECT CONDITIONS

A. PROTECTION AND MAINTENANCE OF OFF-SITE AREAS: CONTRACTOR SHALL ENSURE THAT CONSTRUCTION RELATED ACTIVITIES DO NOT DAMAGE OFF-SITE FEATURES OR ADJACENT VEGETATION. TALASAEA CONSULTANTS SHALL BE NOTIFIED IMMEDIATELY IF ACCIDENTAL DAMAGE OCCURS. CONTRACTOR SHALL ENSURE THAT ADJACENT ROADS ARE MAINTAINED AND KEPT CLEAR OF SOIL AND/OR OTHER DEBRIS AT ALL TIMES DURING CONSTRUCTION. CONTRACTOR SHALL COMPLY WITH THE GOVERNING JURISDICTION'S CODES REGARDING STREET MAINTENANCE/CLEANING DURING CONSTRUCTION.

B. PLAN CHANGES AND MODIFICATIONS: ANY CHANGES OR MODIFICATIONS TO THE MITIGATION PLANS OR SPECIFICATIONS MUST RECEIVE PRIOR APPROVAL FROM THE OWNER'S REPRESENTATIVE, TALASAEA CONSULTANTS, AND APPLICABLE AGENCIES.

1.3 WARRANTY

A. WARRANTY TERMS AND CONDITIONS: A CONTRACTOR-PROVIDED WARRANTY SHALL EXTEND FOR A PERIOD OF ONE YEAR FROM THE DATE OF PHYSICAL COMPLETION. PHYSICAL COMPLETION FOR THE WORK OF THIS SECTION IS THE DATE WHEN ALL CLEARING/GRUBBING, HABITAT FEATURE PLACEMENT, PLANTING, IRRIGATION, AND RELATED PHASES OF SUCH WORK HAVE BEEN COMPLETED AND ARE ACCEPTED BY THE OWNER'S REPRESENTATIVE, TALASAEA CONSULTANTS, AND APPLICABLE AGENCIES.

PART 2: PRODUCTS AND MATERIALS

2.1 HABITAT FEATURES

A. SWALLOW NESTING BOXES

1. SWALLOW NESTING BOXES AND SHALL BE CONSTRUCTED OF CEDAR OR CYPRESS.
2. CONTRACTOR MAY PURCHASE SWALLOW NESTING BOXES AT:
   a. TALASAEA CONSULTANTS, (425) 861-7550 OR,
   b. SEATTLE AUDUBON SOCIETY, (206) 523-4483 OR,
   c. WILD BIRDS UNLIMITED, (206) 575-4001

B. SNAGS: SNAGS SHALL BE CEDAR OR FIR SPECIES, 24-53 FEET LONG, WITH A MINIMUM OF EIGHT MAIN BRANCHES, AND A MINIMUM DIAMETER OF 20 INCHES AT GROUND LEVEL AFTER INSTALLATION.

C. DOWN LOGS: DOWN LOGS SHALL BE CEDAR OR FIR SPECIES, HAVE A 20 FOOT MINIMUM LENGTH, WITH OR WITHOUT ROOTS, AND A MINIMUM DIAMETER OF 18 INCHES. BARK SHALL BE KEPT INTACT. ENDS THAT HAVE BEEN CUT SHALL BE DISTRESSED AND NOT BLUNT.

D. STUMPS: STUMPS SHALL BE EITHER PART-DECAYED, RELOCATED STUMPS, OR CUT LIVE ROOTWADS WITH A MINIMUM OF THREE FEET OF TRUNK 20 INCHES IN DIAMETER MINIMUM. ENDS THAT HAVE BEEN CUT SHALL BE DISTRESSED AND NOT BLUNT.

2.2 WOODCHIP PATH

A. PATH SURFACING SHALL BE CLEAN WOODCHIPS. SEE DETAIL ON MITIGATION PLANS.

2.3 TOPSOIL

A. TOPSOIL: TOPSOIL THAT HAS BEEN STOCKPILED ON-SITE FOR REUSE IN PROJECT AREA(S) OR IMPORTED FROM OFF-SITE SOURCES SHALL BE FERTILE, FRIABLE, SANDY LOAM SURFACE SOIL, FREE OF SUBSOIL, CLAY LUMPS, BRUSH, WEEDS, ROOTS, STUMPS, STONES LARGER THAN 1 INCH IN ANY DIMENSION, LITTER, OR ANY OTHER EXTRANEOUS OR TOXIC MATTER HARMFUL TO PLANT GROWTH.

B. ORGANIC CONTENT: IMPORTED TOPSOIL SHALL CONSIST OF ORGANIC MATERIALS AMENDED AS NECESSARY TO PRODUCE A BULK ORGANIC CONTENT OF AT LEAST 10 PERCENT AND NOT GREATER THAN 20 PERCENT, AS DETERMINED BY AASHTO-T-194.

2.4 MULCH

A. BARK OR WOODCHIP MULCH SHALL BE DERIVED FROM DOUGLAS FIR, PINE OR HEMLOCK SPECIES. THE MULCH SHALL NOT CONTAIN RESIN, TANNIN OR OTHER COMPOUNDS IN QUANTITIES THAT WOULD BE DETRIMENTAL TO ANIMAL, PLANT LIFE OR WATER QUALITY.

B. MULCH SHALL BE GROUND SO THAT A MINIMUM OF 95% OF THE MATERIAL WILL PASS THROUGH A 1.5-INCH SIEVE AND NOT MORE THAT 55%, BY LOOSE VOLUME, WILL PASS THROUGH A US NO. 4 SIEVE.

PART 3: EXECUTION

A. SURVEY/STAKE/FLAG LIMITS OF CLEARING:

1. PRIOR TO ANY CONSTRUCTION, A LICENSED SURVEYOR SHALL SURVEY, STAKE, AND FLAG CLEARING LIMITS. CLEARING LIMITS ARE DEPICTED ON THE MITIGATION PLANS. TALASAEA CONSULTANTS SHALL REVIEW AND APPROVE FLAGGING OF CLEARING LIMITS PRIOR TO ANY VEGETATION REMOVAL. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ACTUAL LOCATIONS OF VEGETATION TO BE SAVED AND REQUEST THAT TALASAEA CONSULTANTS MODIFY THE MITIGATION PLAN AS NECESSARY TO AVOID ALL SIGNIFICANT NATIVE VEGETATION.

B. FLAG AND PROTECT EXISTING VEGETATION TO REMAIN:

1. CONTRACTOR SHALL BE RESPONSIBLE FOR AVOIDING DISTURBANCE TO EXISTING VEGETATION LOCATED OUTSIDE THE CLEARING LIMITS. NO REMOVAL OF ANY VEGETATION SHALL OCCUR WITHOUT PRIOR APPROVAL BY TALASAEA CONSULTANTS.
2. TALASAEA CONSULTANTS SHALL FLAG EXISTING VEGETATION TO REMAIN LOCATED WITHIN THE MITIGATION AREA. FLAGGED VEGETATION SHALL NOT BE DISTURBED, UNLESS APPROVED IN WRITING BY TALASAEA CONSULTANTS.
3. CONTRACTOR SHALL EXERCISE CARE TO PREVENT INJURY TO THE TRUNK, ROOTS, AND BRANCHES OF TREES AND SHRUBS TO REMAIN. ANY WOODY PLANT TO REMAIN THAT IS DAMAGED DURING CONSTRUCTION SHALL BE TREATED IMMEDIATELY AFTER DAMAGE OCCURS, AND TALASAEA CONSULTANTS SHALL BE NOTIFIED OF INCIDENT. DAMAGE TREATMENT SHALL INCLUDE EVENLY CUTTING BROKEN BRANCHES, BROKEN ROOTS, AND DAMAGED TREE BARK. INJURED PLANTS SHALL BE THOROUGHLY WATERED AND ADDITIONAL MEASURES SHALL BE TAKEN, AS APPROPRIATE, TO AID IN PLANT SURVIVAL.

C. PLACE EROSION CONTROL MEASURES:

1. CONTRACTOR SHALL INSTALL SILT FENCING WHERE SHOWN ON THE MITIGATION PLANS PRIOR TO ANY MITIGATION CONSTRUCTION ACTIVITY. CONTRACTOR SHALL MAINTAIN EROSION CONTROL FACILITIES UNTIL COMPLETION OF CONSTRUCTION. TALASAEA CONSULTANTS SHALL VERIFY AND APPROVE LOCATIONS OF EROSION CONTROL MEASURES PRIOR TO COMMENCING MITIGATION CONSTRUCTION.
2. CONTRACTOR SHALL MAINTAIN EROSION CONTROL MEASURES FOR THE DURATION OF THE PROJECT. THESE MEASURES SHALL REMAIN IN PLACE UNTIL AUTHORIZATION IS GIVEN BY TALASAEA CONSULTANTS FOR REMOVAL OR LOCATION ADJUSTMENT. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO REMOVE ALL EROSION CONTROL MEASURES ADJACENT TO SENSITIVE AREAS WHEN AUTHORIZED BY TALASAEA CONSULTANTS.
3. AS CONSTRUCTION PROGRESSES AND SEASONAL CONDITIONS DICTATE, EROSION CONTROL FACILITIES SHALL BE MAINTAINED AND/OR ALTERED AS REQUIRED BY TALASAEA CONSULTANTS TO ENSURE CONTINUED EROSION/SEDIMENTATION CONTROL.
4. WHERE POSSIBLE, NATURAL GROUND COVER VEGETATION SHALL BE MAINTAINED FOR EROSION CONTROL.

D. INVASIVE/NON-NATIVE VEGETATION REMOVAL FROM MITIGATION AREAS:

1. CONTRACTOR SHALL GRUB OUT ALL NON-NATIVE AND INVASIVE VEGETATION WITHIN BUFFER MITIGATION AREAS AS SHOWN ON THE MITIGATION PLANS, WITH THE EXCEPTION OF FLAGGED EXISTING VEGETATION TO REMAIN. IN AREAS OF EXISTING VEGETATION, CONTRACTOR SHALL REMOVE INVASIVE SPECIES INCLUDING, BUT ARE NOT LIMITED TO: SCOT'S BROOM, ENGLISH IVY, HIMALAYAN AND EVERGREEN BLACKBERRY, PURPLE LOOSESTRIFE, HEDGE BINDWEED (MORNING GLORY), JAPANESE KNOTWEED, CANADA THISTLE, AND CREEPING NIGHTSHADE. INVASIVE/NON-NATIVE VEGETATION SHALL BE REMOVED BY HAND WITH MINIMAL DISTURBANCE TO THE EXISTING NATIVE VEGETATION TO REMAIN. ALL ROOTS SHALL BE REMOVED TO THE MAXIMUM EXTENT PRACTICABLE.
2. REED CANARYGRASS CONTROL: REED CANARYGRASS SHALL BE MOWED CLOSE AND TREATED WITH AN HERBICIDE APPROVED FOR USE IN AQUATIC AREAS (E.G., RODEO, OR EQUAL). HERBICIDE TREATMENT SHALL BE APPLIED THREE (3) TIMES PRIOR TO PLANTING.
3. ALL GRUBBED VEGETATION SHALL BE EXPORTED FROM THE SITE AND DISPOSED OF IN AN APPROVED MANNER FOLLOWING ALL APPLICABLE LOCAL/STATE/FEDERAL REGULATIONS.
4. TALASAEA CONSULTANTS SHALL DESIGNATE ANY ADDITIONAL PLANT SPECIES TO BE REMOVED DURING MITIGATION CONSTRUCTION.

E. INSTALL SNAGS:

1. INSTALL SNAGS UPON COMPLETION OF CLEARING/GRUBBING AT LOCATIONS DEPICTED ON MITIGATION PLANS. SNAGS SHALL BE ANCHORED INTO SUBGRADE A MINIMUM OF 25 PERCENT OF THE TOTAL LENGTH, AS DEPICTED IN THE PLAN DETAIL. TALASAEA CONSULTANTS SHALL APPROVE SNAG LOCATIONS PRIOR TO INSTALLATION.

F. TOPSOIL

1. IN ALL CLEARED AND GRUBBED BUFFER MITIGATION AREAS, EXISTING SOIL SHALL BE AMENDED (OR TOPSOIL IMPORTED) TO PROVIDE A 9-INCH MINIMUM DEPTH OF TOPSOIL. NOTE: PRIOR TO PLACING TOPSOIL, SUBGRADE SHALL BE DECOMPACTED OR SCARIFIED TO A MINIMUM DEPTH OF 12" IN AREAS WHERE EXISTING PAVING AND/OR BUILDINGS WERE REMOVED.

G. HABITAT FEATURES: PLACE HABITAT FEATURES UPON COMPLETION OF TOPSOIL AND/OR SOIL AMENDMENT PLACEMENT, AS DEPICTED ON THE MITIGATION PLANS AND DETAILS. TALASAEA CONSULTANTS SHALL APPROVE LOCATIONS PRIOR TO PLACEMENT.

1. SWALLOW NESTING BOXES: ATTACH ONE NESTING BOX TO EACH INSTALLED SNAG A MINIMUM OF 15 FEET OFF THE GROUND ON THE SOUTHEAST SIDE OF THE SNAG.
2. DOWN LOGS: TO CUT/BREAK DOWN LOGS, FIRST SCORE THE LOG AT THE DESIRED LENGTH BY MECHANICAL MEANS, THEN SNAP THE LOG AT THE SCORED LOCATION TO CREATE A NATURAL LOOK TO THE BREAK. TWIST BROKEN ENDS TO DISGUISE SAW CUTS. HABITAT FEATURES THAT HAVE BEEN CUT SHALL HAVE NO BLUNT ENDS.
3. STUMPS: STUMPS SHALL BE SET UPRIGHT.

H. INSTALL SHORELINE VIEWPOINTS & ACCESS PATHS:

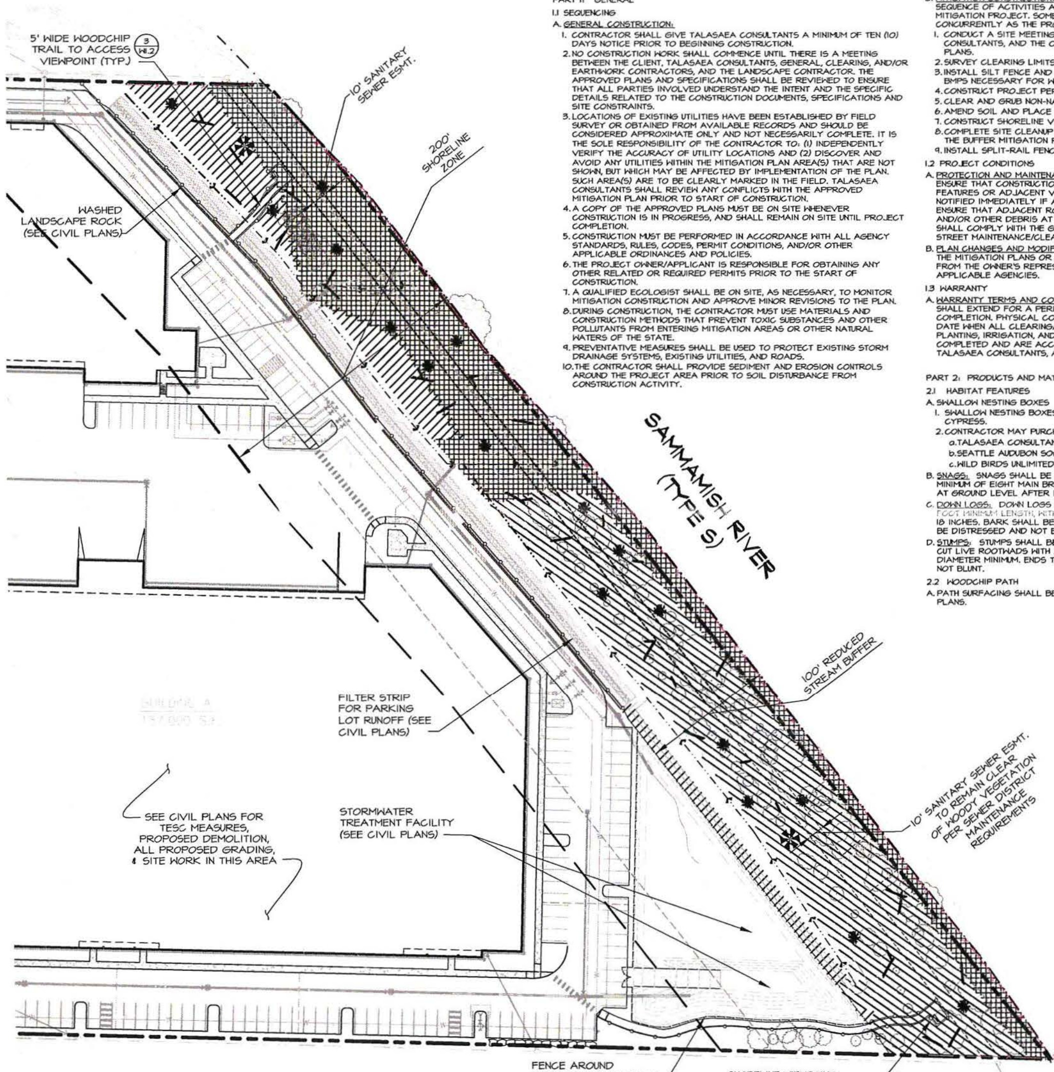
1. CONSTRUCT WOODCHIP SHORELINE VIEWPOINTS AND ASSOCIATED ACCESS PATHS IN STREAM BUFFER WHERE SHOWN ON PLANS PER PLAN DETAIL.

I. MULCH CLEARED/GRUBBED BUFFER AREAS: TALASAEA CONSULTANTS SHALL BE PROVIDED A MULCH SAMPLE PRIOR TO IT BEING DELIVERED TO THE SITE. NO BUFFER AREAS SHALL BE SEEDED.

1. CONTRACTOR SHALL SPREAD MULCH OVER ALL DISTURBED SOIL BUFFER AREAS THAT HAVE BEEN CLEARED/GRUBBED TO ACHIEVE A UNIFORM DEPTH OF 3 INCHES.

J. INSPECTIONS: PRIOR TO PLANT INSTALLATION, TALASAEA CONSULTANTS SHALL APPROVE ALL CLEARING/GRUBBING WORK AND HABITAT FEATURE PLACEMENT. IF ITEMS ARE TO BE CORRECTED, A PUNCH LIST SHALL BE PREPARED BY TALASAEA CONSULTANTS AND SUBMITTED TO THE CONTRACTOR FOR COMPLETION. AFTER PUNCH LIST ITEMS HAVE BEEN COMPLETED, TALASAEA CONSULTANTS SHALL REVIEW THE PROJECT FOR FINAL ACCEPTANCE OF PUNCH LIST ITEMS, AND PLANTING MAY THEN PROCEED.

K. SOIL STABILIZATION: IF THERE IS A DELAY IN CONSTRUCTION FOR ANY REASON, CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE OF EROSION CONTROL MEASURES, DRAINAGE, AND TEMPORARY IRRIGATION DURING CONSTRUCTION DELAY PERIOD, UNLESS OTHERWISE STATED IN WRITING.



CLEARING AND GRUBBING PLAN

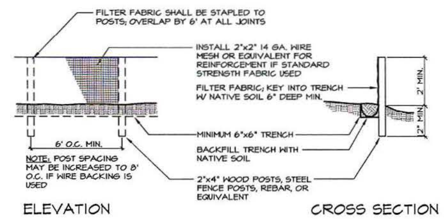
GRAPHIC SCALE (IN FEET)
0 25 50 100
SCALE: 1"=50'
NORTH

PLAN LEGEND

- PROPERTY LINE
- 200' SHORELINE ZONE BOUNDARY
- STREAM ORDINARY HIGH WATER MARK (OHWM)
- FLOOD AE ZONE BOUNDARY
- POST-CONSTRUCTION DITCH CENTERLINE
- PROPOSED SPLIT-RAIL FENCE (2/W1.1)
- EXISTING CONTOUR
- 100 PROPOSED 1' CONTOUR (SEE CIVIL PLANS)
- EXISTING CONIFEROUS/DECIDUOUS TREES TO REMAIN
- APPROXIMATE LOCATION OF EXISTING NATIVE SHRUB VEGETATION TO REMAIN

CLEARING & GRUBBING LEGEND

- SILT FENCE/LIMIT OF BUFFER MITIGATION WORK - SEE DETAIL (1/W1.2)
- SNAG W/ SWALLOW NEST BOX - SEE DETAIL (2/W1.2)
- LARGE WOODY DEBRIS (down logs)
- HABITAT STUMP
- IN AREAS OF EXISTING VEGETATION, GRUB OUT ANY INVASIVE SPECIES, BY HAND, WHERE POSSIBLE.
- EXISTING HIMALAYAN/EVERGREEN BLACKBERRY & REED CANARYGRASS TO BE CLEARED & GRUBBED BY MACHINE, WHERE POSSIBLE.
- DECOMPACT EXISTING SOILS TO A DEPTH OF 12 INCHES IN AREAS WHERE ASPHALT PAVING WAS REMOVED PRIOR TO ADDING TOPSOIL OR SOIL AMENDMENTS.

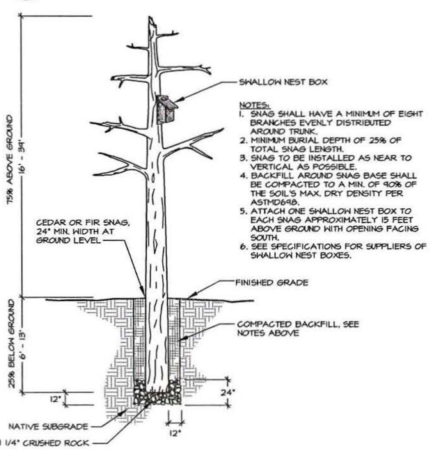


SILT FENCE MAINTENANCE STANDARDS:

1. ANY DAMAGE SHALL BE REPAIRED IMMEDIATELY.
2. IF CONCENTRATED FLOWS ARE EVIDENT UPSLOPE OF THE FENCE, THEY MUST BE INTERCEPTED AND CONVEYED TO A SEDIMENT POND.
3. CONTRACTOR SHALL CHECK THE UPSLOPE SIDE OF THE FENCE FOR SIGNS OF CLOGGING AND SUBSEQUENT CHANNELIZATION OF FLOWS PARALLEL TO THE FENCE. IF THIS OCCURS, REPLACE THE FENCE AND/OR REMOVE THE TRAPPED SEDIMENT.
4. SEDIMENT SHALL BE REMOVED WHEN ACCUMULATION EXCEEDS 6" IN DEPTH.

(1) SILT FENCE

SCALE: NTS



NOTES:

1. SNAG SHALL HAVE A MINIMUM OF EIGHT BRANCHES EVENLY DISTRIBUTED AROUND TRUNK.
2. MINIMUM BURIAL DEPTH OF 25% OF TOTAL SNAG LENGTH.
3. SNAG TO BE INSTALLED AS NEAR TO VERTICAL AS POSSIBLE.
4. BACKFILL AROUND SNAG BASE SHALL BE COMPACTED TO A MIN. OF 90% OF THE SOIL'S MAX. DRY DENSITY PER ASTMD698.
5. ATTACH ONE SWALLOW NEST BOX TO EACH SNAG APPROXIMATELY 15 FEET ABOVE GROUND WITH OPENING FACING SOUTH.
6. SEE SPECIFICATIONS FOR SUPPLIERS OF SWALLOW NEST BOXES.

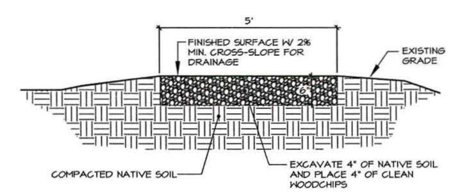
(2) SNAG WITH NEST BOX DETAIL

SCALE: NTS

MITIGATION CONSTRUCTION SEQUENCE

THE FOLLOWING PROVIDES THE GENERAL SEQUENCE OF ACTIVITIES ANTICIPATED TO BE NECESSARY TO COMPLETE THIS MITIGATION PROJECT. SOME OF THESE ACTIVITIES MAY BE CONDUCTED CONCURRENTLY AS THE PROJECT PROGRESSES.

1. CONDUCT A SITE MEETING BETWEEN THE CONTRACTOR, TALASAEA CONSULTANTS, AND THE OWNER'S REPRESENTATIVE TO REVIEW THE PROJECT PLANS.
2. SURVEY CLEARING LIMITS.
3. INSTALL SILT FENCE AND ANY OTHER EROSION AND SEDIMENTATION CONTROL BMPS NECESSARY FOR WORK IN THE MITIGATION AREAS.
4. CONSTRUCT PROJECT PER CIVIL PLANS.
5. CLEAR AND GRUB NON-NATIVE/INVASIVE VEGETATION FROM BUFFER
6. AMEND SOIL AND PLACE LARGE WOODY MATERIAL.
5. CONSTRUCT SHORELINE VIEWPOINTS AND ACCESS PATHS.
6. COMPLETE SITE CLEANUP AND INSTALL PLANT MATERIAL AS INDICATED ON THE BUFFER MITIGATION PLANTING PLAN.
7. INSTALL SPLIT-RAIL FENCE AND CRITICAL AREA SIGNS.



(3) WOODCHIP PATH

N.T.S.

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NOTES

1. SURVEY PROVIDED BY HARMSEN & ASSOCIATES, INC.; P.O. BOX 516, MONROE, WA 98272; (360) 794-7811
2. SITE PLAN PROVIDED BY BARGHAUSEN CONSULTING ENGINEERS, INC., 18215 72ND AVE S, KENT, WA 98032; (425) 251-6222
3. SOURCE DRAWINGS HAVE BEEN MODIFIED BY TALASAEA CONSULTANTS FOR VISUAL ENHANCEMENT.
4. THIS PLAN IS AN ATTACHMENT TO THE CRITICAL AREAS SPECIAL STUDY REPORT PREPARED BY TALASAEA CONSULTANTS, DATED 15 JANUARY 2016.

TALASAEA CONSULTANTS, INC.
Resource & Environmental Planning
15020 Bear Creek Road Northeast - Woodinville, Washington 98077
Bus (425) 861-7550 - Fax (425) 861-7549

EXHIBIT 9
PAGE 56 OF 59

STREAM BUFFER MITIGATION PLAN
CLEARING & GRUBBING PLAN, DETAILS & NOTES
THE RESERVE AT WOODINVILLE
WOODINVILLE, WASHINGTON

Revisions	Date	By

Date	1-15-2016
Scale	AS NOTED
Designed	AO
Drawn	ABS
Checked	AO
Approved	AO
Project #	1349D
Sheet #	W1.2

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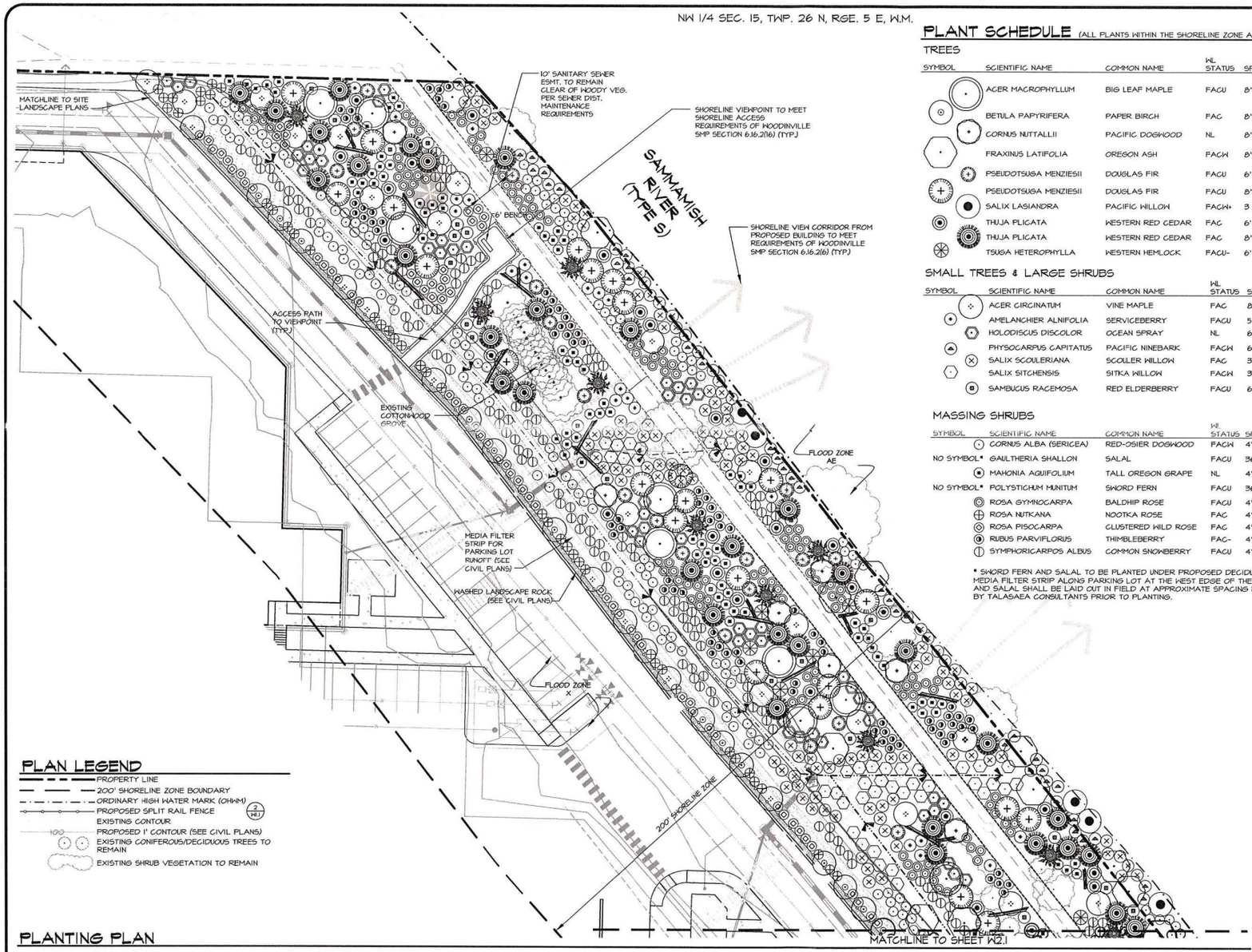
NW 1/4 SEC. 15, TWP. 26 N, RGE. 5 E, W.M.



PLAN LEGEND

- PROPERTY LINE
- 200' SHORELINE ZONE BOUNDARY
- ORDINARY HIGH WATER MARK (OHWM)
- PROPOSED SPLIT RAIL FENCE (2 / W1)
- EXISTING CONTOUR
- 100 PROPOSED 1' CONTOUR (SEE CIVIL PLANS)
- EXISTING CONIFEROUS/DECIDUOUS TREES TO REMAIN
- EXISTING SHRUB VEGETATION TO REMAIN

PLANTING PLAN

GRAPHIC SCALE (IN FEET) 0 10 20 40
SCALE: 1"=20'
NORTH

PLANT SCHEDULE (ALL PLANTS WITHIN THE SHORELINE ZONE ARE NATIVE)

TREES

SYMBOL	SCIENTIFIC NAME	COMMON NAME	WL STATUS	SPACING	QTY.	SIZE (MIN.)	NOTES
	ACER MACROPHYLLUM	BIG LEAF MAPLE	FACU	8' O.C.	10	4-5' HT.	SINGLE TRUNK, WELL BRANCHED
	BETULA PAPYRIFERA	PAPER BIRCH	FAC	8' O.C.	16	4-5' HT.	SINGLE TRUNK, WELL BRANCHED
	CORNUS NUTTALLII	PACIFIC DOGWOOD	NL	8' O.C.	14	4-5' HT.	SINGLE TRUNK, WELL BRANCHED
	FRAXINUS LATIFOLIA	OREGON ASH	FACW	8' O.C.	49	5-6' HT.	SINGLE TRUNK, WELL BRANCHED
	PSEUDOTSUGA MENZIESII	DOUGLAS FIR	FACU	6' O.C.	34	2-3' HT.	2 GAL., FULL & BUSHY
	PSEUDOTSUGA MENZIESII	DOUGLAS FIR	FACU	8' O.C.	40	4-5' HT.	B&B, FULL & BUSHY
	SALIX LASIANDRA	PACIFIC WILLOW	FACW+	3 PER SYMBOL	60	4' CUTTING	1/2" DIA. MIN., BARK INTACT
	THUJA PLICATA	WESTERN RED CEDAR	FAC	6' O.C.	56	2-3' HT.	2 GAL., FULL & BUSHY
	THUJA PLICATA	WESTERN RED CEDAR	FAC	8' O.C.	70	4-5' HT.	B&B, FULL & BUSHY
	TSUGA HETEROPHYLLA	WESTERN HEMLOCK	FACU-	6' O.C.	16	2-3' HT.	2 GAL., FULL & BUSHY

SMALL TREES & LARGE SHRUBS

SYMBOL	SCIENTIFIC NAME	COMMON NAME	WL STATUS	SPACING	QTY.	SIZE (MIN.)	NOTES
	ACER CIRCINATUM	VINE MAPLE	FAC	8' O.C.	53	4' HT.	MULTI-STEM (3 MIN.)
	AMELANCHIER ALNIFOLIA	SERVICEBERRY	FACU	5' O.C.	46	24" HT.	MULTI-CANE (3 MIN.)
	HOLODISCUS DISCOLOR	OCEAN SPRAY	NL	6' O.C.	94	24" HT.	MULTI-CANE (3 MIN.)
	PHYSOCARPUS CAPITATUS	PACIFIC NINEBARK	FACW	6' O.C.	123	24" HT.	MULTI-CANE (3 MIN.)
	SALIX SCOULERIANA	SCOULER WILLOW	FAC	3 PER SYMBOL	429	4' CUTTING	1/2" DIA. MIN., BARK INTACT
	SALIX SITCHENSIS	SITKA WILLOW	FACW	3 PER SYMBOL	135	4' CUTTING	1/2" DIA. MIN., BARK INTACT
	SAMBUCUS RACEMOSA	RED ELDERBERRY	FACU	6' O.C.	63	24" HT.	MULTI-CANE (3 MIN.)

MASSING SHRUBS

SYMBOL	SCIENTIFIC NAME	COMMON NAME	WL STATUS	SPACING	QTY.	SIZE (MIN.)	NOTES
	CORNUS ALBA (SERICEA)	RED-OSIER DOGWOOD	FACW	4' O.C.	268	18" HT.	MULTI-CANE (3 MIN.)
NO SYMBOL*	GAULTHERIA SHALLON	SALAL	FACU	36" O.C.	700	1 GAL	FULL & BUSHY
	MAHONIA AQUIFOLIUM	TALL OREGON GRAPE	NL	4' O.C.	174	18" HT.	FULL & BUSHY
NO SYMBOL*	POLYSTICHUM MUNITUM	SWORD FERN	FACU	36" O.C.	700	1 GAL	FULL & BUSHY
	ROSA GYMNOCARPA	BALDHIP ROSE	FACU	4' O.C.	142	18" HT.	MULTI-CANE (3 MIN.)
	ROSA NUTKANA	NOOTKA ROSE	FAC	4' O.C.	123	18" HT.	MULTI-CANE (3 MIN.)
	ROSA PISOCARPA	CLUSTERED WILD ROSE	FAC	4' O.C.	118	18" HT.	MULTI-CANE (3 MIN.)
	RUBUS PARVIFLORUS	THIMBLEBERRY	FAC-	4' O.C.	121	18" HT.	MULTI-CANE (3 MIN.)
	SYMPHORICARPOS ALBUS	COMMON SNOWBERRY	FACU	4' O.C.	301	18" HT.	MULTI-CANE (3 MIN.)

* SWORD FERN AND SALAL TO BE PLANTED UNDER PROPOSED DECIDUOUS TREES (EXCEPT WILLOWS AND TREES AT EDGE OF MEDIA FILTER STRIP ALONG PARKING LOT AT THE WEST EDGE OF THE BUFFER). SYMBOLS NOT SHOWN ON PLANS. SWORD FERN AND SALAL SHALL BE LAID OUT IN FIELD AT APPROXIMATE SPACING NOTED ABOVE AND FINAL LOCATIONS SHALL BE APPROVED BY TALASAEA CONSULTANTS PRIOR TO PLANTING.

GENERAL PLANT INSTALLATION NOTES

1. PLANT TREES AND/OR SHRUBS 1" HIGHER THAN DEPTH GROWN AT NURSERY.
2. FOR CONTAINER TREES AND/OR SHRUBS, SCORE FOUR SIDES OF ROOTBALL PRIOR TO PLANTING. BUTTERFLY ROOTBALL IF ROOT CIRCLING IS EVIDENT.
3. STAKE DECIDUOUS AND EVERGREEN TREES 4 FEET AND OVER IN HEIGHT WITH ONE (1) STAKE PER TREE. STAKE TREES IMMEDIATELY AFTER PLANTING. PLACE STAKE AT THE OUTER EDGE OF THE ROOTS OR ROOTBALL, IN LINE WITH THE PREVAILING WIND. STAKES SHALL BE LOOSELY ATTACHED USING CHAIN-LOCK TREE TIES TO ALLOW FOR SOME TRUNK MOVEMENT. STAKES TO BE VERTICAL, PARALLEL, EVEN-TOPPED, UNSCARRED AND DRIVEN INTO UNDISTURBED SUBGRADE. REMOVE AFTER ONE YEAR.
4. WATER PLANTS IMMEDIATELY UPON PLANTING, THEN PROVIDE MANUAL WATERING OR A TEMPORARY IRRIGATION SYSTEM TO PREVENT PLANT MORTALITY AND ENSURE PROPER PLANT ESTABLISHMENT. PLANTS SHALL RECEIVE A MINIMUM OF APPROXIMATELY ONE INCH OF WATER EVERY WEEK DURING THE DRY SEASON (GENERALLY JUNE 15TH - OCTOBER 15TH, OR EARLIER OR LATER IF CONDITIONS WARRANT) FOR THE FIRST SEASON AFTER PLANTING. IRRIGATION AMOUNTS MAY NEED TO BE INCREASED DURING PROLONGED PERIODS OF HOT, DRY WEATHER.
5. FERTILIZE ALL TREES AND SHRUBS WITH A SLOW-RELEASE GENERAL PURPOSE GRANULAR FERTILIZER OR SLOW-RELEASE TABLETS AT MANUFACTURER'S SPECIFIED RATE.
6. ALL PLANTING AREAS SHALL HAVE A MINIMUM 9-INCH DEPTH OF TOPSOIL. IF TOPSOIL IS INSUFFICIENT IN EITHER QUANTITY OR QUALITY WITHIN PLANTING AREAS, AS DETERMINED BY TALASAEA CONSULTANTS, TOPSOIL SHALL BE RESTORED BY EITHER RE-INSTALLING PREVIOUSLY STOCKPILED TOPSOIL, IMPORTING NEW TOPSOIL, OR AMENDING EXISTING SOILS IN PLACE WITH ORGANIC MATTER TO ACHIEVE A 9" MINIMUM DEPTH. ALL TOPSOIL SHALL HAVE A BULK ORGANIC CONTENT OF AT LEAST 10 PERCENT AND NOT GREATER THAN 20 PERCENT, AS DETERMINED BY AASHTO-T-194.
7. PROVIDE 3" MINIMUM DEPTH OF MEDIUM BARK MULCH IN ALL PLANTING AREAS. MULCH SHALL BE DERIVED FROM FIR, PINE, OR HEMLOCK SPECIES AND SHALL NOT CONTAIN TRASH, ROCKS, OR OTHER DEBRIS OR MATERIALS DETRIMENTAL TO PLANT GROWTH. MULCH SHALL BE GROUND SO THAT A MINIMUM OF 95% OF THE MATERIAL WILL PASS THROUGH A 1.5-INCH SIEVE AND NOT MORE THAN 55%, BY LOOSE VOLUME, WILL PASS THROUGH A US NO. 4 SIEVE.

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NOTES

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TALASAEA CONSULTANTS, INC.
Resource & Environmental Planning
16809 East Creek Road Northeast • Redmond, Washington 98077
Tel (425) 867-0821 • Fax (425) 867-0823

EXHIBIT 9
PAGE 59 OF 59

STREAM BUFFER MITIGATION PLAN
PLANTING PLAN, PLANT SCHEDULE, & NOTES
THE RESERVE AT WOODINVILLE
WOODINVILLE, WASHINGTON

Revisions	Date	By

Date	1-15-2016
Scale	AS NOTED
Designed	AG
Drawn	ABS
Checked	AG
Approved	AG

Project #1349D

Sheet # W2.0

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Plotted January 14, 2016

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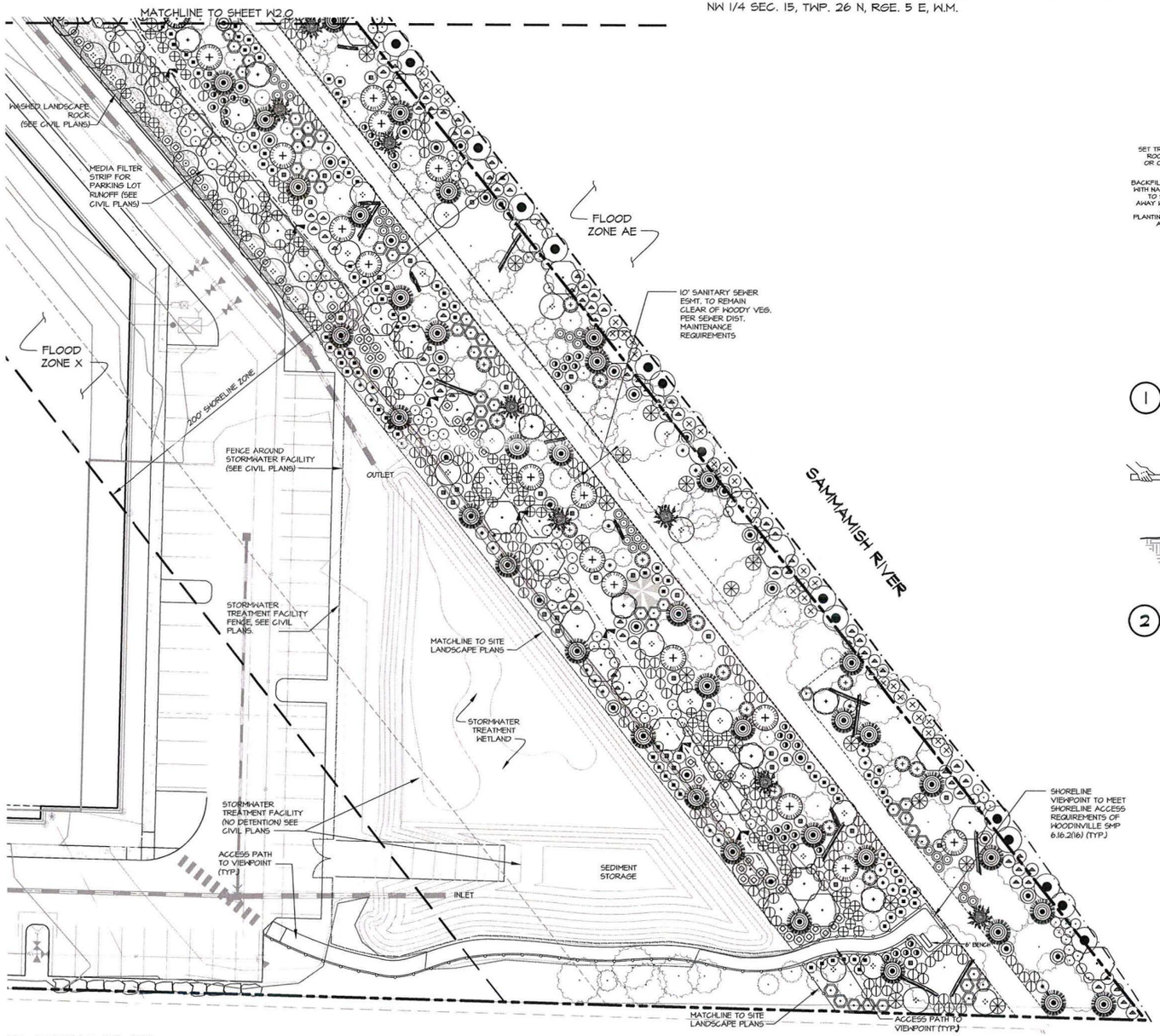


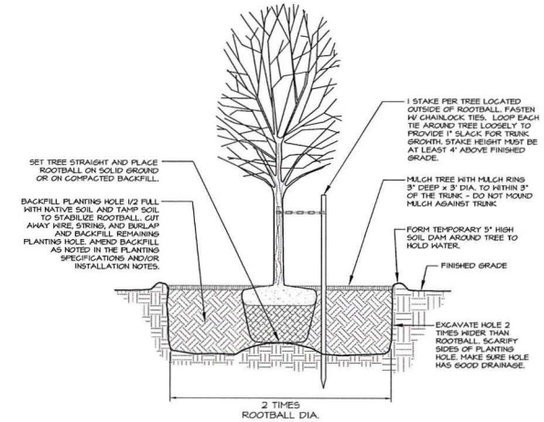
PLANTING PLAN

GRAPHIC SCALE (IN FEET) 0 10 20 40
SCALE: 1"=20'

NORTH

PLAN LEGEND

- PROPERTY LINE
- 200' SHORELINE ZONE BOUNDARY
- ORDINARY HIGH WATER MARK (OHWM)
- PROPOSED SPLIT RAIL FENCE (2 RAIL)
- EXISTING CONTOUR
- PROPOSED 1' CONTOUR (SEE CIVIL PLANS)
- EXISTING CONIFEROUS/DECIDUOUS TREES TO REMAIN
- EXISTING SHRUB VEGETATION TO REMAIN



1 B&B TREE PLANTING DETAIL.
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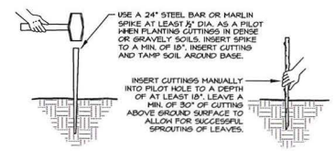
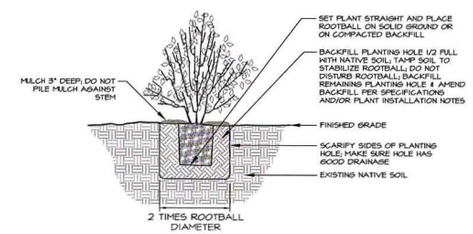


NOTES:
1. CUTTINGS SHALL BE SPECIES AS NOTED IN THE PLANT SCHEDULE.
2. CUTTINGS SHALL BE AT LEAST 1/2" IN DIA. AND 4' IN LENGTH.
3. CUTTINGS MUST BE MADE FROM LIVE AND VIGOROUS WOODY MATERIAL WITH SIDE BRANCHES REMOVED AND BARK INTACT.
4. THE BUTT ENDS SHALL BE CLEANLY CUT AT AN ANGLE FOR EASY INSERTION INTO THE SOIL.
5. THE TOP SHALL BE CUT SQUARE OR BLUNT.
6. CUTTINGS SHALL BE PLANTED WITHIN 24 HOURS OF CUTTING AND MUST BE KEPT MOIST AT ALL TIMES PRIOR TO PLANTING.
7. BOTTOM OF CUTTINGS SHALL BE TREATED WITH ROOTING HORMONE PRIOR TO PLANTING.

2 CUTTING INSTALLATION DETAIL
N.T.S.



3 CONTAINER STOCK PLANTING DETAIL
N.T.S.

811 Know what's below. Call before you dig.

NOTES

1. SURVEY PROVIDED BY HARMSEN & ASSOCIATES, INC., P.O. BOX 516, MONROE, WA 98272; (360) 794-7811
2. SITE PLAN PROVIDED BY BARGHAUSEN CONSULTING ENGINEERS, INC., 18215 72ND AVE S, KENT, WA 98032; (425) 251-6222
3. SOURCE DRAWINGS HAVE BEEN MODIFIED BY TALASAEA CONSULTANTS FOR VISUAL ENHANCEMENT.
4. THIS PLAN IS AN ATTACHMENT TO THE CRITICAL AREAS SPECIAL STUDY REPORT PREPARED BY TALASAEA CONSULTANTS, DATED 15 JANUARY 2016.

TALASAEA CONSULTANTS, INC.
Resource & Environmental Planning
16000 Bear Creek Road Northeast • Woodinville, Washington 98077
Ph: (425) 481-9080 • Fax: (425) 481-7183

EXHIBIT 9
PAGE 58 OF 59

STREAM BUFFER MITIGATION PLAN
PLANTING PLAN & DETAILS
THE RESERVE AT WOODINVILLE
WOODINVILLE, WASHINGTON

Revisions	Date	By

Date	1-15-2016
Scale	AS NOTED
Designed	AO
Drawn	ABS
Checked	AO
Approved	AO

Project #1344D

Sheet # W2.1

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Plotted January 14, 2016

PLANTING SPECIFICATIONS

PART 1: GENERAL

1.1 SEQUENCING

A. GENERAL CONSTRUCTION

1. CONTRACTOR SHALL GIVE TALASAEA CONSULTANTS A MINIMUM OF TEN (10) DAYS NOTICE PRIOR TO COMMENCING CONSTRUCTION.
2. NO CONSTRUCTION WORK SHALL COMMENCE UNTIL THERE IS A MEETING BETWEEN THE CLIENT, TALASAEA CONSULTANTS, THE GENERAL, CLEARING, AND/OR EARTHWORK CONTRACTORS, AND THE LANDSCAPE CONTRACTOR. THE APPROVED PLANS AND SPECIFICATIONS SHALL BE REVIEWED TO ENSURE THAT ALL PARTIES INVOLVED UNDERSTAND THE INTENT AND THE SPECIFIC DETAILS RELATED TO THE CONSTRUCTION DOCUMENTS, SPECIFICATIONS, AND SITE CONSTRAINTS.
3. LOCATIONS OF EXISTING UTILITIES HAVE BEEN ESTABLISHED BY FIELD SURVEY OR OBTAINED FROM AVAILABLE RECORDS AND SHOULD BE CONSIDERED APPROXIMATE ONLY AND NOT NECESSARILY COMPLETE. IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO: (1) INDEPENDENTLY VERIFY THE ACCURACY OF UTILITY LOCATIONS, AND (2) DISCOVER AND AVOID ANY UTILITIES WITHIN THE MITIGATION AREA(S) THAT ARE NOT SHOWN, BUT WHICH MAY BE AFFECTED BY IMPLEMENTATION OF THE PLAN. SUCH AREA(S) ARE TO BE CLEARLY MARKED IN THE FIELD. TALASAEA CONSULTANTS SHALL RESOLVE ANY CONFLICTS WITH THE APPROVED GRADING PLAN PRIOR TO START OF CONSTRUCTION.
4. A COPY OF THE APPROVED PLANS MUST BE ON SITE WHENEVER CONSTRUCTION IS IN PROGRESS, AND SHALL REMAIN ON SITE UNTIL PROJECT COMPLETION.
5. CONSTRUCTION MUST BE PERFORMED IN ACCORDANCE WITH ALL AGENCY STANDARDS, RULES, CODES, PERMIT CONDITIONS, AND/OR OTHER APPLICABLE ORDINANCES AND POLICIES.
6. THE PROJECT OWNER/APPLICANT IS RESPONSIBLE FOR OBTAINING ANY OTHER RELATED OR REQUIRED PERMITS PRIOR TO THE START OF CONSTRUCTION.
7. A QUALIFIED WETLAND CONSULTANT SHALL BE ON SITE, AS NECESSARY, TO MONITOR CONSTRUCTION AND APPROVE MINOR REVISIONS TO THE PLAN.
8. DURING CONSTRUCTION, THE CONTRACTOR MUST USE MATERIALS AND CONSTRUCTION METHODS THAT PREVENT TOXIC SUBSTANCES AND OTHER POLLUTANTS FROM ENTERING MITIGATION AREAS OR OTHER NATURAL WATERS OF THE STATE.
9. PREVENTATIVE MEASURES SHALL BE USED TO PROTECT EXISTING STORM DRAINAGE SYSTEMS, EXISTING UTILITIES, AND ROADS.
10. PROVIDE SEDIMENT AND EROSION CONTROLS AROUND THE PROJECT AREA PRIOR TO SOIL DISTURBANCE FROM CONSTRUCTION ACTIVITY.

B. MITIGATION CONSTRUCTION: THE FOLLOWING PROVIDES THE GENERAL SEQUENCE OF ACTIVITIES ANTICIPATED TO BE NECESSARY TO COMPLETE THE PLANTING PORTION OF THE MITIGATION PROJECT. SOME OF THESE ACTIVITIES MAY BE CONDUCTED CONCURRENTLY AS THE PROJECT PROGRESSES.

1. CONDUCT A SITE MEETING BETWEEN THE CONTRACTOR, TALASAEA CONSULTANTS, AND THE OWNER'S REPRESENTATIVE TO REVIEW THE PROJECT PLANS, STAGING/STOCKPILE AREAS, AND MATERIAL DISPOSAL AREAS.
2. PLANT TREES AND SHRUBS AS INDICATED ON MITIGATION PLANS.
3. PLANT WETLAND EMERGENTS AND STAKES (CUTTINGS).
4. MULCH PLANTS INSTALLED IN NON-GRADED BUFFER AREAS.
5. INSTALL TEMPORARY IRRIGATION SYSTEM AND PROGRAM FOR 0.5 INCHES OF WATER EVERY 3 DAYS.
6. INSTALL FENCING AND CRITICAL AREA PROTECTION SIGNS (IF REQUIRED).

1.2 SUBMITTALS

A. PRODUCT DATA: FURNISH THE FOLLOWING WITH EACH PLANT MATERIAL DELIVERY:

1. INVOICES INDICATING SIZES AND VARIETY OF PLANT MATERIAL.
2. CERTIFICATES OF INSPECTION REQUIRED BY STATE AND FEDERAL AGENCIES.

B. QUALITY CONTROL SUBMITTALS:

1. PRIOR TO DELIVERY OF MATERIALS, CERTIFICATES OF COMPLIANCE ATTESTING THAT MATERIALS MEET THE SPECIFIED REQUIREMENTS SHALL BE FURNISHED FOR THE FOLLOWING: PLANTS, TOPSOIL, FERTILIZER, AND ORGANIC MULCH. CERTIFIED COPIES OF THE MATERIAL CERTIFICATES SHALL INCLUDE THE FOLLOWING:
   a. PLANT MATERIALS: BOTANICAL NAME, COMMON NAME, SIZE, QUANTITY BY SPECIES, AND LOCATION WHERE GROWN.
   b. IMPORTED TOPSOIL: PARTICLE SIZE, PH, ORGANIC MATTER CONTENT, TEXTURAL CLASS, SOLUBLE SALTS, CHEMICAL AND MECHANICAL ANALYSES.
   c. FERTILIZER: CHEMICAL ANALYSIS AND PERCENT COMPOSITION.
   d. IMPORTED MULCH: COMPOSITION AND SOURCE.

1.3 REFERENCES

A. SIZE AND GRADING STANDARDS: SHALL CONFORM TO THE CURRENT EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK, PUBLISHED BY THE AMERICAN NURSERY AND LANDSCAPE ASSOCIATION.

1.4 QUALITY ASSURANCE

A. WORKER'S QUALIFICATIONS: THE PERSONS PERFORMING THE PLANTING AND THEIR SUPERVISOR(S) SHALL BE PERSONALLY EXPERIENCED WITH PLANTING AND CARING FOR PLANT MATERIAL, AND SHALL HAVE BEEN REGULARLY EMPLOYED BY A COMPANY ENGAGED IN PLANTING AND CARING FOR PLANT MATERIAL FOR A MINIMUM OF 2 YEARS.

B. PLANT MATERIAL: ALL PLANT MATERIALS SHALL BE LOCALLY GROWN OR REGIONALLY ACCLIMATIZED TO THE PACIFIC NORTHWEST.

1.5 DELIVERY, INSPECTION, STORAGE AND HANDLING

A. DELIVERY: A DELIVERY SCHEDULE SHALL BE PROVIDED AT LEAST 10 CALENDAR DAYS PRIOR TO THE FIRST DAY OF DELIVERY. PLANT MATERIALS SHALL BE DELIVERED TO THE JOB SITE NOT MORE THAN 7 WORKING DAYS PRIOR TO THEIR RESPECTIVE PLANTING DATES.

B. PROTECTION DURING DELIVERY: PLANT MATERIAL SHALL BE PROTECTED DURING DELIVERY TO PREVENT DESICCATION AND DAMAGE TO THE BRANCHES, TRUNK, ROOT SYSTEM, OR EARTH BALL. BRANCHES SHALL BE PROTECTED BY TYING-IN. EXPOSED BRANCHES SHALL BE COVERED DURING TRANSPORT.

C. FERTILIZER: FERTILIZER SHALL BE DELIVERED IN MANUFACTURER'S STANDARD SIZED BAGS SHOWING WEIGHT, ANALYSIS, AND MANUFACTURER'S NAME. STORE UNDER A WATERPROOF COVER OR IN A DRY PLACE AS DESIGNATED BY THE OWNER'S REPRESENTATIVE.

D. INSPECTION: ALL PLANT MATERIALS SHALL BE INSPECTED UPON ARRIVAL AT THE JOB SITE BY THE OWNER'S REPRESENTATIVE FOR CONFORMITY TO TYPE AND QUANTITY WITH REGARD TO THEIR RESPECTIVE SPECIFICATIONS.

E. MULCH: A MULCH SAMPLE SHALL BE INSPECTED BY TALASAEA CONSULTANTS PRIOR TO THE MULCH BEING DELIVERED TO THE SITE.

F. STORAGE:

1. PLANT MATERIAL NOT INSTALLED ON THE DAY OF ARRIVAL AT THE SITE SHALL BE STORED AND PROTECTED IN DESIGNATED AREAS. PLANTS STORED ON THE PROJECT SITE SHALL BE PROTECTED FROM EXTREME WEATHER CONDITIONS BY INSULATING THE ROOTS, ROOT BALLS OR CONTAINERS WITH SAWDUST, SOIL, COMPOST, BARK OR WOODCHIPS. PLANT MATERIAL SHALL BE PROTECTED FROM DIRECT EXPOSURE TO WIND AND SUN. BARE-ROOT PLANT MATERIAL SHALL BE HEELED-IN. CUTTINGS AND EMERGENT PLANTS MUST BE PROTECTED FROM DRYING AT ALL TIMES AND SHALL BE HEELED-IN WITH MOIST SOIL OR OTHER INSULATING MATERIAL. ALL PLANT MATERIAL STORED ON-SITE SHALL BE WATERED DAILY UNTIL INSTALLED.
2. STORAGE OF OTHER MATERIALS SHALL BE IN DESIGNATED AREAS.

1.6 SCHEDULING

A. PLANTING SEASON: INSTALL WOODY PLANTS BETWEEN OCTOBER 1 AND FEBRUARY 15 WHENEVER THE TEMPERATURE IS ABOVE 32 DEGREES F AND THE SOIL IS IN A WORKABLE CONDITION, UNLESS OTHERWISE APPROVED IN WRITING. CUTTINGS SHALL ONLY BE USED IF PLANTING OCCURS BETWEEN DECEMBER 1ST AND APRIL 1ST.

B. PLANT INSTALLATION: EXCEPT FOR CONTAINER-GROWN PLANT MATERIAL, THE MAXIMUM TIME BETWEEN THE DIGGING AND INSTALLATION OF PLANT MATERIAL SHALL BE 21 DAYS. THE MAXIMUM TIME BETWEEN PLANT INSTALLATION AND MULCH PLACEMENT SHALL BE 72 HOURS.

1.7 WARRANTY

A. WARRANTY PERIOD: THE CONTRACTOR-PROVIDED WARRANTY SHALL EXTEND FOR A PERIOD OF ONE YEAR FROM THE DATE OF PHYSICAL COMPLETION. PHYSICAL COMPLETION FOR THE WORK OF THIS SECTION IS THE DATE WHEN ALL GRADING, PLANTING, IRRIGATION, AND RELATED WORK HAS BEEN COMPLETED AND IS ACCEPTED BY THE OWNER'S REPRESENTATIVE, TALASAEA CONSULTANTS, AND APPLICABLE AGENCIES.

B. WARRANTY TERMS: CONTRACTOR'S WARRANTY SHALL INCLUDE REPLACEMENT OF PLANTS DUE TO MORTALITY (SAME SIZE AND SPECIES SHOWN ON THE DRAWINGS). PLANTS REPLACED UNDER THIS WARRANTY SHALL BE WARRANTED FOR AN ADDITIONAL YEAR AFTER REPLACEMENT.

C. EXCEPTIONS: LOSS DUE TO EXCESSIVELY SEVERE CLIMATOLOGICAL CONDITIONS (SUBSTANTIATED BY 10-YEAR RECORDED WEATHER CHARTS), OR CASES OF NEGLECT BY OWNER, OR CASES OF ABUSE/DAMAGE BY OTHERS.

PART 2: PRODUCTS AND MATERIALS

2.1 PLANTS

A. GENERAL: ALL PLANT MATERIAL WILL CONFORM TO THE VARIETIES SPECIFIED OR SHOWN IN THE PLANT LIST(S) INDICATED ON THE MITIGATION PLANS AND BE TRUE TO BOTANICAL NAME AS LISTED IN: HITCHCOCK, C.L., AND A. CRONQUIST. 1973. FLORA OF THE PACIFIC NORTHWEST. UNIVERSITY OF WASHINGTON PRESS.

B. SHRUBS AND TREES:

1. TALASAEA SHALL EXAMINE PLANT MATERIAL PRIOR TO PLANTING. ANY MATERIAL NOT MEETING THE REQUIRED SPECIFICATIONS SHALL BE IMMEDIATELY REMOVED FROM THE SITE AND REPLACED WITH LIKE MATERIAL THAT MEETS THE REQUIRED STANDARDS. PLANT MATERIAL SHALL MEET THE REQUIREMENTS OF STATE AND FEDERAL LAWS WITH RESPECT TO PLANT DISEASE AND INFESTATIONS. INSPECTION CERTIFICATES, REQUIRED BY LAW, SHALL ACCOMPANY EACH AND EVERY SHIPMENT AND SHALL BE SUBMITTED TO TALASAEA UPON CONTRACTOR'S RECEIPT OF PLANT MATERIAL.
2. PLANT MATERIALS SHALL BE LOCALLY GROWN (WESTERN WASHINGTON, WESTERN OREGON, OR WESTERN BC), HEALTHY, BUSHY, IN VIGOROUS GROWING CONDITION, AND GUARANTEED TO BE TRUE TO SIZE, NAME, AND VARIETY. IF REPLACEMENT OF PLANT MATERIAL IS NECESSARY DUE TO CONSTRUCTION DAMAGE OR PLANT FAILURE WITHIN ONE YEAR OF INSTALLATION, THE SIZES, SPECIES, AND QUANTITIES SHALL BE EQUAL TO SPECIFIED PLANTS, AS INDICATED ON THE PLANS.
3. PLANTS SHALL BE NURSERY GROWN, WELL-ROOTED, OF NORMAL GROWTH AND CHARACTER, AND FREE FROM DISEASE OR INFESTATION. TALASAEA CONSULTANTS RESERVES THE RIGHT TO REQUIRE REPLACEMENT OR SUBSTITUTION OF ANY PLANTS DEEMED UNSUITABLE.
4. TREES SHALL HAVE UNIFORM BRANCHING, SINGLE STRAIGHT TRUNKS (UNLESS SPECIFIED AS MULTI-STEM, MULTI-CANE, OR MULTI-TRUNK), AND AN INTACT AND UNDAMAGED CENTRAL LEADER. CONTAINER STOCK SHALL HAVE BEEN GROWN IN A CONTAINER FOR AT LEAST ONE FULL GROWING SEASON AND SHALL HAVE A WELL DEVELOPED ROOT SYSTEM. PLANT MATERIAL THAT IS ROOT-BOUND OR HAS DAMAGED ROOT ZONES OR BROKEN ROOT BALLS WILL NOT BE ACCEPTED.
5. CONIFEROUS TREES SHALL BE NURSERY GROWN, FULL AND BUSHY, WITH UNIFORM BRANCHING AND A NATURAL, NON-SHEARED FORM. ORIGINAL CENTRAL LEADER MUST BE HEALTHY AND UNDAMAGED. MAXIMUM GAP BETWEEN BRANCHING SHALL NOT EXCEED 9 INCHES, AND LENGTH OF TOP LEADER SHALL NOT EXCEED 12 INCHES.
6. SHRUBS SHALL HAVE A MINIMUM OF THREE STEMS AND SHALL BE A MINIMUM HEIGHT OF 18 INCHES.
7. TREES AND SHRUBS SHALL HAVE DEVELOPED ROOT AND BRANCH SYSTEMS. DO NOT PRUNE BRANCHES BEFORE DELIVERY.
8. NATIVE PLANT CUTTINGS SHALL BE GROWN AND COLLECTED IN THE MARITIME PACIFIC NORTHWEST. CUTTINGS SHALL BE OF ONE TO TWO-YEAR-OLD WOOD, ½ INCH DIAMETER MINIMUM. CUTTINGS SHALL BE A MINIMUM OF 4 FEET IN LENGTH WITH 4 LATERAL BUDS EXPOSED ABOVE GROUND AFTER PLANTING. THE TOP OF EACH CUTTING SHALL BE A MINIMUM OF 1 INCH ABOVE A LEAF BUD, THE BOTTOM CUT 2 INCHES BELOW A BUD. THE BASAL ENDS OF THE CUTTINGS SHALL BE CUT AT A 45 DEGREE ANGLE AND MARKED CLEARLY SO THAT THE ROOTING END IS PLANTED IN THE SOIL. CUTTINGS MUST BE KEPT COVERED AND MOIST DURING STORAGE AND TRANSPORT, AND NO CUTTINGS SHALL BE STORED MORE THAN THREE DAYS FROM DATE OF CUTTING. CUTTINGS SHALL ONLY BE USED IF PLANTING OCCURS BETWEEN DECEMBER 1ST AND APRIL 1ST. FOR PLANTING BETWEEN APRIL 1ST AND DECEMBER 1ST, CONTAINER PLANTS SHALL BE USED.
9. PLANTS SHALL BE FREE OF SPLITS AND CHECKS, BARK ABRASIONS, AND DISFIGURING KNOTS.
10. FOR DECIDUOUS PLANTS, BUDS SHALL BE INTACT AND REASONABLY CLOSED AT TIME OF PLANTING, IF DORMANT.
11. BALLED AND BURLAPPED PLANTS SHALL HOLD A NATURAL BALL. MANUFACTURED ROOT BALLS ARE UNACCEPTABLE.
12. PLANTS SHALL CONFORM TO SIZES INDICATED ON THE PLANT SCHEDULE. PLANTS MAY BE LARGER THAN THE MINIMUM SIZES SPECIFIED.

C. NOXIOUS SPECIES: ALL PLANT STOCK AND OTHER RE-VEGETATION MATERIALS SHALL BE FREE FROM THE SEED OR OTHER PLANT COMPONENTS OF ANY NOXIOUS OR INVASIVE SPECIES, AS IDENTIFIED BY THE KING COUNTY NOXIOUS WEED CONTROL BOARD.

D. SUBSTITUTIONS: SUBSTITUTIONS WILL NOT BE PERMITTED WITHOUT A WRITTEN REQUEST AND APPROVAL FROM THE OWNER'S REPRESENTATIVE, TALASAEA CONSULTANTS, AND APPLICABLE AGENCIES.

2.2 PLANTING SOIL

A. TOPSOIL: IF SUITABLE STOCKPILED NATIVE TOPSOIL IS NOT AVAILABLE FOR MITIGATION PLANTINGS, TOPSOIL SHALL BE OBTAINED FROM OUTSIDE SOURCES. STOCKPILED OR IMPORTED TOPSOIL SHALL BE FERTILE, FRIABLE, SANDY LOAM SURFACE SOIL, FREE OF SUBSOIL, CLAY LUMPS, BRUSH, WEEDS, ROOTS, STUMPS, STONES LARGER THAN 1 INCH IN ANY DIMENSION, LITTER, OR ANY OTHER EXTRANEOUS OR TOXIC MATTER HARMFUL TO PLANT GROWTH.

B. ORGANIC CONTENT: IMPORTED TOPSOIL SHALL CONSIST OF ORGANIC MATERIALS AMENDED AS NECESSARY TO PRODUCE A BULK ORGANIC CONTENT OF AT LEAST 10 PERCENT AND NOT GREATER THAN 20 PERCENT, AS DETERMINED BY AASHTO-T-194.

C. COMPOST: COMPOST SHALL MEET THE DEFINITION FOR COMPOSTED MATERIALS AS DEFINED BY THE WASHINGTON STATE DEPARTMENT OF ECOLOGY.

D. SOIL AMENDMENTS: WOODY PLANTINGS SHALL BE FERTILIZED WITH A SLOW-RELEASE GENERAL GRANULAR FERTILIZER (16-16-16), OR SLOW-RELEASE FERTILIZER TABLETS, WITH APPLICATION RATES AS SPECIFIED BY MANUFACTURER. FERTILIZER SHALL BE APPLIED AFTER PLANTING PIT IS BACKFILLED (OR DURING BACKFILL IN THE CASE OF TABLETS), AND PRIOR TO APPLICATION OF MULCH. FERTILIZER SHALL NOT BE APPLIED BETWEEN NOVEMBER AND MARCH.

2.3 MULCH

A. BARK OR WOODCHIP MULCH SHALL BE DERIVED FROM DOUGLAS FIR, PINE, OR HEMLOCK SPECIES. THE MULCH SHALL NOT CONTAIN RESIN, TANNIN, OR OTHER COMPOUNDS IN QUANTITIES THAT WOULD BE DETRIMENTAL TO ANIMAL, PLANT LIFE, OR WATER QUALITY. SAWDUST SHALL NOT BE USED AS MULCH.

B. MULCH SHALL BE MEDIUM-COARSE GROUND WITH AN APPROXIMATELY 3-INCH MINUS PARTICLE SIZE. FINE PARTICLES SHALL BE MINIMIZED SO THAT NOT MORE THAN 30%, BY LOOSE VOLUME, WILL PASS THROUGH A US NO. 4 SIEVE.

2.4 MISCELLANEOUS MATERIALS

A. STAKES, DEADMEN AND GUY STAKES: SOUND, DURABLE, WESTERN RED CEDAR, OR OTHER APPROVED WOOD, FREE OF INSECT OR FUNGUS INFESTATION.

B. CHAIN-LOCK TREE TIES: ½-INCH WIDE, PLASTIC.

PART 3: EXECUTION

3.1 SOIL PREPARATION

A. PLANTING AREA CONDITIONS: CONTRACTOR SHALL VERIFY THAT PLANT INSTALLATION CONDITIONS ARE SUITABLE WITHIN THE PROJECT AREA(S). ANY UNSATISFACTORY CONDITIONS SHALL BE CORRECTED PRIOR TO START OF WORK. WHEN CONDITIONS DETRIMENTAL TO PLANT GROWTH ARE ENCOUNTERED, SUCH AS RUBBLE FILL, POOR DRAINAGE, COMPACTED SOILS, SIGNIFICANT EXISTING OR INVASIVE VEGETATION, OR OTHER OBSTRUCTIONS, CONTRACTOR SHALL NOTIFY TALASAEA CONSULTANTS PRIOR TO PLANTING. THE BEGINNING OF WORK BY THE CONTRACTOR CONSTITUTES ACCEPTANCE OF CONDITIONS AS SATISFACTORY.

B. PLANTING IN UNDISTURBED, NON-GRADED AREAS: PLANTS INSTALLED IN UNDISTURBED AREAS SHALL BE INTEGRATED WITH EXISTING NATIVE VEGETATION AND PLANTED IN A RANDOM, NATURALISTIC PATTERN. PRIOR TO INSTALLATION OF PLANTINGS, ALL CONSTRUCTION DEBRIS, TRASH, AND NON-NATIVE INVASIVE PLANT MATERIAL SHALL BE REMOVED FROM THE PROJECT AREA. IN NON-GRADED AREAS, TREES AND SHRUBS SHALL BE PIT PLANTED AS SHOWN IN TYPICAL PLANTING DETAILS. PLANTING PITS SHALL BE BACKFILLED WITH A 50/50 MIXTURE OF IMPORTED, WEED-FREE TOPSOIL AND THE SOIL FROM THE PLANTING PIT.

C. PLANTING IN GRADED AREAS: IN GRADED PLANTING AREAS PLANTS SHALL BE INSTALLED IN NEWLY PLACED TOPSOIL.

D. SOIL DECOMPACTION/SCARIFICATION: SOILS IN GRADED/DISTURBED AREAS THAT ARE COMPACTED AND UNSUITABLE FOR PROPER PLANT GROWTH SHALL BE DECOMPACTED AND/OR SCARIFIED TO A MINIMUM DEPTH OF 6 INCHES PRIOR TO TOPSOIL INSTALLATION.

3.2 PLANTING

A. PLANT LAYOUT: PROPOSED LOCATIONS OF TREES AND SHRUBS SHALL BE STAKED AND IDENTIFIED WITH AN APPROVED CODING SYSTEM OR BY PLACEMENT OF THE ACTUAL PLANT MATERIAL. FOR LARGE GROUPINGS OF A SINGLE SPECIES OF SHRUB, LANDSCAPE CONTRACTOR MAY STAKE THE PLANTING BOUNDARIES.

B. OBTAIN LAYOUT APPROVAL FROM TALASAEA CONSULTANTS PRIOR TO EXCAVATION OF PLANTING PITS.

C. PLANTING PIT DIMENSIONS:

3. PIT DEPTH: NOT TO EXCEED THE ROOT BALL OR CONTAINER DEPTH.
4. PIT WIDTH: MEASURED AT THE GROUND SURFACE, 2 TIMES THE WIDTH OF THE ROOT BALL OR CONTAINER, AS INDICATED IN TYPICAL PLANTING DETAILS.
   a. BARE-ROOT PLANTS: DIAMETER EQUAL TO THE WIDTH OF THE ROOT SPREAD.

D. SETTING PLANTS:

1. BALLED PLANTS: SET PLANTS IN POSITION AND BACKFILL 1/2 DEPTH OF BALL. COMPLETELY REMOVE CAGE AND TWINE FROM PLANT AND PULL BURLAP DOWN AS FAR AS POSSIBLE. COMPLETE BACKFILL AND SETTLE WITH WATER. ROOT COLLAR SHALL REMAIN 1 INCH ABOVE ADJACENT GRADE.
2. BARE-ROOT PLANTS: PRUNE BRUISED OR BROKEN ROOTS. SET PLANT IN POSITION AND PLACE WETLAND PLANTING SOIL AROUND ROOTS. USE CARE TO AVOID BRUISING OR BREAKING ROOTS WHEN FIRMING SOIL. SETTLE WITH WATER.
3. SHRUB/TREE PLANTING: SHRUB AND TREE STOCK SHALL BE PLANTED IN HAND-DUG HOLES ACCORDING TO PLANTING DETAILS SHOWN ON THE MITIGATION PLANS. SHRUB AND TREE ROOT BALLS SHALL BE SET SO THAT ROOT COLLARS ARE 1 INCH ABOVE ADJACENT GRADE. ALL BACKFILL SHALL BE GENTLY TAMPED IN PLACE.
4. SURFACE FINISH: FORM A SAUCER AS INDICATED ON TYPICAL PLANTING DETAILS, OR AS DIRECTED. GRADE SOIL TO FORM A BASIN ON THE LOWER SIDE OF SLOPE PLANTINGS TO CATCH AND RETAIN WATER.
5. IN FORESTED AREAS, CONTRACTOR SHALL LOOSELY TIE A 2 FOOT PIECE OF BIODEGRADABLE FLAGGING TO THE TOP PORTION (NOT THE CENTRAL LEADER) OF ALL PLANTED VEGETATION TO FACILITATE POST-CONSTRUCTION PERFORMANCE AND MAINTENANCE REVIEW BY TALASAEA CONSULTANTS AND REGULATORY AGENCIES.
6. ACTUAL PLANT SYMBOL QUANTITIES SHOWN ON THE PLANS SHALL PREVAIL OVER QUANTITIES SHOWN ON THE PLANT SCHEDULE IN THE EVENT OF A DISCREPANCY.

E. MULCHING:

1. GRADED BUFFER AREAS: ARE MULCHED PRIOR TO PLANT INSTALLATION AS DIRECTED IN THE GRADING SPECIFICATIONS.
2. NON-GRADED BUFFER AREAS: PROVIDE A 36-INCH DIAMETER, 3-INCH DEEP MULCH RING AROUND THE BASE OF EACH TREE, AND A 24-INCH DIAMETER, 3-INCH DEEP MULCH RING AROUND THE BASE OF EACH SHRUB.
3. WATER PLANTS THOROUGHLY AFTER MULCHING.

F. PRUNING: PRUNE IMMEDIATELY AFTER PLANTING ONLY AS DIRECTED BY TALASAEA CONSULTANTS.

G. TREE STAKES AND TIES: STAKE DECIDUOUS AND EVERGREEN TREES 4 FEET OR OVER IN HEIGHT WITH ONE (1) STAKE PER TREE. STAKE TREES IMMEDIATELY AFTER PLANTING. PLACE STAKE AT THE OUTER EDGE OF THE ROOTS OR BALL, IN LINE WITH THE PREVAILING WIND, AND AT A 10 DEGREE ANGLE FROM THE TREE TRUNK. LOOSELY ATTACH STAKE TO TREE USING CHAIN-LOCK TIES; TREE SHOULD BE ABLE TO SWAY.

H. INSTALLING TEMPORARY IRRIGATION

1. GENERAL REQUIREMENTS: CONTRACTOR SHALL PROVIDE AN ABOVE-GROUND TEMPORARY IRRIGATION SYSTEM CAPABLE OF FULL HEAD-TO-HEAD COVERAGE OF ALL PLANTED PROJECT AREAS (ENHANCEMENT PLANTINGS WITHIN EXISTING VEGETATED WETLAND AREAS MAY NOT NEED COVERAGE BY TEMPORARY IRRIGATION SYSTEM, TALASAEA CONSULTANTS SHALL CONFIRM AREAS OF COVERAGE FOR TEMPORARY IRRIGATION SYSTEM). THE TEMPORARY IRRIGATION SYSTEM SHALL EITHER UTILIZE CONTROLLER AND POINT OF CONNECTION (POC) FROM THE SITE IRRIGATION SYSTEM OR SHALL INCLUDE A SEPARATE POC AND CONTROLLER WITH A BACKFLOW PREVENTION DEVICE PER WATER JURISDICTION INSPECTION AND APPROVAL. THE SYSTEM SHALL BE ZONED TO PROVIDE OPTIMAL PRESSURE AND UNIFORMITY OF COVERAGE, AS WELL AS SEPARATION BETWEEN AREAS OF FULL SUN AND SHADE AND FOR SLOPES IN EXCESS OF 5 PERCENT. THE SYSTEM SHALL BE OPERATIONAL FOR A MINIMUM OF THE FIRST TWO GROWING SEASONS AFTER PLANTING (THE FIRST TWO YEARS OF THE PERFORMANCE MONITORING PERIOD), OR LONGER IF REQUIRED TO ENSURE PROPER PLANT ESTABLISHMENT. THE SYSTEM SHALL BE REMOVED UPON FINAL APPROVAL OF THE MITIGATION PROJECT AT THE END OF THE PERFORMANCE MONITORING PERIOD.
2. SYSTEM DESIGN AND MATERIALS: ELECTRONIC VALVES SHALL BE THE SAME MANUFACTURER AS THOSE USED FOR THE SITE IRRIGATION SYSTEM, OR SHALL BE RAIN BIRD PEB SERIES OR EQUAL IF SYSTEM IS NOT CONTIGUOUS WITH THE SITE SYSTEM. VALVES SHALL BE SIZED TO ACCOMMODATE PRESSURE AND ZONE CONSUMPTION REQUIREMENTS OF THE SYSTEM AND SHALL BE INSTALLED BELOW GRADE IN CARSON (OR EQUAL) VALVE BOXES. WIRING SHALL BE INSULATED MULTI-STRAND, TAPED TO THE MAIN AT 6-INCH INTERVALS WITH DUCT TAPE WRAPS. ON-GRADE MAIN AND LATERAL LINES SHALL BE CLASS 200 PVC BELL PIPE WITH SOLVENT WELDED FITTINGS, SECURED IN-PLACE WITH WIRE STAPLES WHERE NECESSARY ON SLOPED AREAS. LINES SHALL BE PLACED 12 INCHES BELOW GRADE IN 4 INCH PCV SLEEVES WHERE VEHICULAR OR MAINTENANCE ACCESS IS NEEDED ACROSS LINES TO THE PROJECT AREA(S). MAXIMUM MAIN LINE SIZE SHALL BE 1½ INCHES AND MAY BE LOOPED BACK TO THE POC TO REDUCE PRESSURE LOSS. LATERAL LINES SHALL BE SIZED IN DECREASING DOWNSTREAM ORDER PER RAIN BIRD DESIGN STANDARDS; THE MINIMUM LATERAL SIZE SHALL BE ¾ INCH. HEADS SHALL BE ROTOR OR IMPACT TYPE INSTALLED 4 FEET ABOVE FINISHED GRADE ON 2-INCH DIAMETER WOOD TREE STAKES. STAKES SHALL BE SECURE IN THE GROUND, EMBEDDED TO A MINIMUM DEPTH OF 24 INCHES. HEADS AND ¾ INCH PVC RISERS SHALL BE SECURED TO STAKES WITH CONSTRICTING HOSE CLAMPS; NO FUNNY PIPE SHALL BE USED. HEADS AND NOZZLES SHALL PROVIDE MATCHED PRECIPITATION RATES FOR EACH ZONE.
3. PROGRAMMING: IRRIGATION SYSTEM SHALL BE PROGRAMMED TO PROVIDE APPROXIMATELY 1/2 INCH OF WATER EVERY THREE DAYS DURING THE DRY SEASON (APPROXIMATELY JUNE 15TH TO OCTOBER 15TH). IRRIGATION AMOUNTS IN ZONES LOCATED IN THE SHADE OR ON STEEP SLOPES MAY BE REDUCED IF APPROVED BY TALASAEA CONSULTANTS OR THE PROJECT ECOLOGIST/BIOLOGIST.
4. WATER AND POWER SUPPLY FOR SYSTEM: THE OWNER SHALL PROVIDE WATER AND ELECTRICITY FOR THE SYSTEM.
5. AS-BUILT DRAWING: A CHART DESCRIBING THE LOCATION OF ALL INSTALLED OR OPEN ZONES AND CORRESPONDING CONTROLLER NUMBERS SHALL BE PROVIDED BY THE CONTRACTOR AND PLACED INSIDE THE CONTROLLER AND GIVEN TO THE OWNER'S REPRESENTATIVE.
6. WARRANTY: THE IRRIGATION SYSTEM SHALL INCLUDE A ONE-YEAR WARRANTY AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP FROM THE DATE OF FINAL PROJECT ACCEPTANCE. THE WARRANTY SHALL INCLUDE SYSTEM ACTIVATION AND WINTERIZATION FOR THE FIRST YEAR AND IMMEDIATE REPAIR OF THE SYSTEM IF IT IS OBSERVED TO BE MALFUNCTIONING.

I. CRITICAL AREAS FENCE AND SIGNS: INSTALL CRITICAL AREAS FENCE AND CRITICAL AREAS SIGNS WHERE SHOWN ON PLANS PER INSTALLATION DETAILS PROVIDED ON PLANS.

J. RESTORE EXISTING NATURAL OR LANDSCAPED AREAS:

1. EXISTING NATURAL OR LANDSCAPED AREAS THAT ARE DAMAGED DURING CONSTRUCTION SHALL BE RESTORED TO THEIR ORIGINAL CONDITION, UNLESS IMPROVEMENTS OR MODIFICATIONS ARE SPECIFIED FOR THOSE AREAS.
2. CONTRACTOR SHALL EXERCISE CARE TO PREVENT INJURY TO THE TRUNK, ROOTS, OR BRANCHES OF ANY TREES OR SHRUBS THAT ARE TO REMAIN. ANY LIVING, WOODY PLANT THAT IS DAMAGED DURING CONSTRUCTION SHALL BE TREATED WITHIN 24 HOURS OF OCCURRENCE, AND TALASAEA CONSULTANTS SHALL BE NOTIFIED IMMEDIATELY OF THE INCIDENT. DAMAGE TREATMENT SHALL INCLUDE EVENLY CUTTING BROKEN BRANCHES, BROKEN ROOTS, AND DAMAGED TREE BARK. INJURED PLANTS SHALL BE THOROUGHLY WATERED AND ADDITIONAL MEASURES SHALL BE TAKEN, AS APPROPRIATE, TO AID IN PLANT SURVIVAL.

K. FINAL INSPECTION AND APPROVAL: THE CONTRACTOR SHALL NOTIFY TALASAEA CONSULTANTS IN WRITING AT LEAST TEN DAYS PRIOR TO THE REQUESTED DATE OF A PROJECT COMPLETION INSPECTION. IF ITEMS ARE TO BE CORRECTED, A PUNCH LIST SHALL BE PREPARED BY TALASAEA CONSULTANTS AND SUBMITTED TO THE CONTRACTOR FOR COMPLETION. AFTER PUNCH LIST ITEMS HAVE BEEN COMPLETED, TALASAEA CONSULTANTS SHALL REVIEW THE PROJECT AGAIN FOR FINAL ACCEPTANCE OF PLAN IMPLEMENTATION. IF PUNCH LIST ITEMS REQUIRE PLANT REPLACEMENT, AND THE INSPECTION OCCURS OUTSIDE OF A SUITABLE PLANTING SEASON, PLANTS SHALL BE REPLACED DURING THE NEXT PLANTING SEASON.

L. AS-BUILT PLAN: CONTRACTOR IS RESPONSIBLE FOR VERIFYING PLANT LOCATIONS AND QUANTITIES ON THE PLANT SCHEDULE WITH THOSE REPRESENTED AS SYMBOLS ON THE MITIGATION PLANS. CONTRACTOR SHALL KEEP A COMPLETE SET OF PRINTS AT THE JOB SITE DURING CONSTRUCTION FOR THE PURPOSE OF RECORDING IN-THE-FIELD CHANGES OR MODIFICATIONS TO THE APPROVED PLANS. THIS INFORMATION SHALL BE UPDATED ON A DAILY BASIS AS NECESSARY.

PART 4: ONE YEAR CONTRACTOR WARRANTY

NOTE: THESE MAINTENANCE SPECIFICATIONS APPLY TO THE ONE-YEAR CONTRACTOR WARRANTY PERIOD ONLY. IF THIS MITIGATION PROJECT REQUIRES LONG-TERM PERFORMANCE MONITORING, AS DETERMINED BY THE GOVERNING JURISDICTION, THE MAINTENANCE SPECIFICATIONS AND GUIDELINES ASSOCIATED WITH THE PERFORMANCE MONITORING STANDARDS ARE INCLUDED IN THE MITIGATION REPORT ASSOCIATED WITH THIS PLAN SET, AND MAY ALSO BE INCLUDED ON A SEPARATE PLAN SHEET IF REQUIRED.

A. REVIEW OF MAINTENANCE REQUIREMENTS: CONTRACTOR SHALL REVIEW LANDSCAPE MAINTENANCE RECOMMENDATIONS WITH A QUALIFIED WETLAND BIOLOGIST FROM TALASAEA CONSULTANTS WHO IS FAMILIAR WITH THE STATED GOALS AND OBJECTIVES OF THE PROJECT PLAN.

B. MAINTENANCE ACTIVITIES: CONTRACTOR SHALL MAINTAIN TREES AND SHRUBS FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE IN ORDER TO MAINTAIN HEALTHY GROWTH AND HABITAT DIVERSITY. MAINTENANCE ACTIVITIES SHALL INCLUDE, BUT ARE NOT LIMITED TO: (A) REPLACING PLANTS DUE TO MORTALITY, (B) TIGHTENING AND REPAIRING TREE STAKES, (C) RESETTING PLANTS TO PROPER GRADES AND UPRIGHT POSITIONS, AND (D) CORRECTING DRAINAGE PROBLEMS AS REQUIRED.

C. IRRIGATION:

1. SYSTEM MAINTENANCE AND REPAIR: THE CONTRACTOR SHALL BE RESPONSIBLE FOR ACTIVATING, WINTERIZING, MAINTAINING, AND CONTINUALLY VERIFYING THE ADEQUATE OPERATION OF THE TEMPORARY IRRIGATION SYSTEM FOR THE FIRST GROWING SEASON FOLLOWING INSTALLATION. SYSTEM FUNCTION (INCLUDING ELECTRONIC VALVE AND CONTROLLER FUNCTION) SHALL BE INSPECTED FOR OPERATION AND FULL COVERAGE OF ALL PLANTED AREAS DURING EACH MAINTENANCE VISIT. THE SYSTEM SHALL BE REPAIRED IMMEDIATELY IF FOUND TO BE DAMAGED OR MALFUNCTIONING. SYSTEM SHALL BE PROGRAMMED AND MAINTAINED TO PROVIDE APPROXIMATELY ½ INCH OF WATER EVERY THREE DAYS.

D. STAKE AND TIE REMOVAL: CONTRACTOR SHALL REMOVE TREE STAKES AND TIES ONE YEAR AFTER INSTALLATION, UNLESS RECEIVING WRITTEN PERMISSION FROM TALASAEA CONSULTANTS TO DELAY REMOVAL OF STAKES AND TIES

E. EROSION AND DRAINAGE: CONTRACTOR SHALL CORRECT EROSION AND DRAINAGE PROBLEMS AS REQUIRED.

F. IRRIGATION SYSTEM REMOVAL: CONTRACTOR SHALL REMOVE IRRIGATION SYSTEM APPROXIMATELY 2 YEARS AFTER PLANTING, OR AS APPROVED BY TALASAEA CONSULTANTS.

G. FINAL MAINTENANCE INSPECTION AND APPROVAL: UPON COMPLETION OF THE ONE-YEAR MAINTENANCE PERIOD, AN INSPECTION BY TALASAEA CONSULTANTS SHALL BE CONDUCTED TO CONFIRM THAT THE PROJECT AREA WAS PROPERLY MAINTAINED. IF ITEMS ARE TO BE CORRECTED, A PUNCH LIST SHALL BE PREPARED AND SUBMITTED TO THE CONTRACTOR FOR CORRECTION. UPON CORRECTION OF THE PUNCH LIST ITEMS, THE PROJECT SHALL BE REVIEWED BY TALASAEA CONSULTANTS FOR FINAL CLOSEOUT OF PLAN IMPLEMENTATION.

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NOTES

1. SURVEY PROVIDED BY HARMSEN & ASSOCIATES, INC.; P.O. BOX 516, MONROE, WA 98272; (360) 794-7811
2. SITE PLAN PROVIDED BY BARGHAUSEN CONSULTING ENGINEERS, INC., 18215 72ND AVE S, KENT, WA 98032; (425) 251-6222
3. SOURCE DRAWINGS HAVE BEEN MODIFIED BY TALASAEA CONSULTANTS FOR VISUAL ENHANCEMENT.
4. THIS PLAN IS AN ATTACHMENT TO THE CRITICAL AREAS SPECIAL STUDY REPORT PREPARED BY TALASAEA CONSULTANTS, DATED 15 JANUARY 2016.

TALASAEA CONSULTANTS, INC.
Resource & Environmental Planning
15020 Bear Creek Road Northeast - Woodinville, Washington 98077
Bus (425) 861-7550 - Fax (425) 861-7549

EXHIBIT 9
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STREAM BUFFER MITIGATION PLAN
PLANTING SPECIFICATIONS
THE RESERVE AT WOODINVILLE
WOODINVILLE, WASHINGTON

Revisions	Date	By

Date 1-15-2016
Scale AS NOTED
Designed AO
Drawn ABS
Checked AO
Approved AO

Project # 1349D

Sheet # W2.2

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