DEPARTMENT OF PLANNING AND COMMUNITY DEVELOPMENT
ENVIRONMENTAL COORDINATOR
450 110th Ave NE., P.O. BOX 90012
BELLEVUE, WA 98009-9012

OPTIONAL DETERMINATION OF NON-SIGNIFICANCE (DNS) NOTICE MATERIALS

The attached materials are being sent to you pursuant to the requirements for the Optional DNS Process (WAC 197-11-355). A DNS on the attached proposal is likely. This may be the only opportunity to comment on environmental impacts of the proposal. Mitigation measures from standard codes will apply. Project review may require mitigation regardless of whether an EIS is prepared. A copy of the subsequent threshold determination for this proposal may be obtained upon request.

File No.	09-119786-LO
Project Name/Address:	Olympic Pipeline Kelsey Crossing 13808 NE 12th Street
Planner:	Kevin LeClair
Phone Number:	425-452-2928
Minimum Comment Period:	**August 20, 2009**

Materials included in this Notice:

- ☒ Blue Bulletin
- ☒ Checklist
- ☒ Vicinity Map
- ☒ Plans
- ☒ Other: Critical Areas Report Materials

ENVIRONMENTAL CHECKLIST 4/18/02

If you need assistance in completing the checklist or have any questions regarding the environmental review process, please visit or call the Permit Center (425-452-6864) between 8 a.m. and 4 p.m., Monday through Friday (Wednesday, 10 to 4). Our TTY number is 425-452-4636.

BACKGROUND INFORMATION

Property Owner:
Olympic Pipe Line Company (see attached drawings).

Proponent:
Olympic Pipe Line Company (Olympic)

Contact Person:
(If different from the owner. All questions and correspondence will be directed to the individual listed.)

Tony Cotton, Olympic

Address:
2319 Lind Ave. SW
Renton, WA 98057

Phone:
(425)-981-2541

Proposal Title:
Olympic MP99 – Kelsey Creek Pipeline Crossing and Fish Passage Mitigation Project

Proposal Location:
(Street address and nearest cross street or intersection) Provide a legal description if available.
Please attach an 8 ½" x 11" vicinity map that accurately locates the proposal site.

The Olympic Pipe Line Company (Olympic) operates 16-inch diameter and 20-inch diameter petroleum products pipelines that extend generally north-south through King County. The cleared pipeline easement is approximately 100 feet wide (within an open easement) that runs north-south through residential and business properties within the City of Bellevue. A small section of the Olympic 16-inch diameter product pipeline, approximately 1 foot in length, has recently been exposed by stream scour at the Kelsey Creek crossing in Bellevue, Washington (see Figure 1). The exposed section of the pipeline is near the left bank of the Kelsey Creek crossing about 600 feet south of Bellevue-Redmond Road (Bel-Red Road) in Bellevue, Washington (see Figure 2).

Give an accurate, brief description of the proposal's scope and nature:

1. General description:

The purpose of the project is to protect the exposed pipeline from corrosion, impact from rocks or other objects, vandalism, the elements, or other possible hazards from exposure. Active erosion is occurring along the left bank where the 20-inch pipeline crosses the creek, therefore additional bank protection measures will be completed at that location. Lastly, fish passage concerns will be addressed by notching two of the existing concrete weirs and installing a rock drop structure downstream of the last weir. The work

will require bypassing stream flows and dewatering segments of the stream where work is to occur.

Federal pipeline safety regulations found in 49CFR195 require that the pipeline be buried or be covered with equivalent protective measures. BP, the owner-manager of Olympic, has concluded that a concrete river weight, such as that proposed for this project, provides equivalent protection. Therefore, Olympic is proposing to protect the pipeline by installing a river weight (concrete half-round pipe) over the exposed section of the 16-inch pipeline. The total length of river weight will be about 8 feet so that the protection extends into the bank approximately 7 feet. In order to install the river weight, it will be necessary to stage a trackhoe on the left bank to remove the rip rap from over and around the 16-inch pipeline along the left bank, then place the river weight over the pipeline. The rip rap will be replaced to its original configuration along the left bank over the pipeline.

Stabilization of the left bank in the vicinity of the 20-inch pipeline crossing will be accomplished by regrading the slope to a more stable inclination and protecting the slope with rip rap. Rip rap will be placed below the stream bed to reduce the potential for erosion at the toe of the bank. Soil lifts will be incorporated into the rip rap to allow planting of live stakes.

Fish passage across the existing weirs will be accomplished by cutting notches in Weir #2 and Weir # 5 and by installing a rock drop structure downstream of Weir #5. The notch in Weir #2 will be approximately 2 feet wide and 0.25 feet deep. The notch in Weir #5 will be approximately 2 feet wide and 0.5 feet deep. The rock drop structure will be constructed about 60 feet downstream of Weir #5, with a crest height about 0.5 feet below the base of the notch in Weir #5. Construction of the rock drop structure will require removal of a segment of gabion that is in poor condition. The extent of gabion to be removed will be determined at the time of construction, but will extend no more than 25 feet downstream from the rock drop structure. Where the pipeline is close to the stream bank, the protective function of the gabion system will be replaced by a buried wing wall, extending downstream a maximum of 25 feet from the rock drop structure along the alignment of existing gabions at the top of the bank.

During the time that work is being accomplished to address fish passage concerns, sediment upstream of Weir # 5 will be removed so that a grocery cart embedded in the stream bottom can be removed. The remainder of sediment and any armoring will be removed upstream and downstream of the weir. Any voids will be backfilled with native glacial soils excavated for the construction of the rock drop structure. A geomembrane will be placed along the upstream and downstream faces of the weir, and then rip rap will be placed with gravel covering the rip rap. In addition, rip rap will be selectively placed along toe of existing gabion baskets downstream of Weir #5 and upstream of the rock drop structure in areas where the bottom of the gabions are corroded and not protected by rip rap placed in 1995.

The site will be accessed from 136th Avenue NE along a utility corridor the pipeline shares with electrical transmission lines owned and operated by Puget Sound Energy.

2. **Acreage of site:**

   Approximately 0.82 acres for the access and proposed staging areas, most of which will occur within an approximately 100 feet wide easement.

3. **Number of dwelling units/buildings to be demolished:**

   None

4. **Number of dwelling units/buildings to be constructed:**

   None

5. **Square footage of buildings to be demolished:**

N/A

6. **Square footage of buildings to be constructed:**
   N/A

7. **Quantity of earth movement (in cubic yards):**
   Total amount of earth movement:
   Approximately 475 cubic yards,

8. **Proposed land use:**
   Continued use as utility corridor. Use will not change.

9. **Design features, including building height, number of stories and proposed exterior materials:**
   None, does not apply.

10. **Other**

Estimated date of completion of the proposal or timing of phasing:

Olympic anticipates beginning construction between August 15th and September 30, 2009 or will postpone work to a similar time frame in 2010. Construction activities may last into early fall depending on contractor schedule and allowed work windows.

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

No.

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

As part of the design and/or permitting for this project, a biologic evaluation, critical areas report, a hydraulic analysis report, and design report were prepared.

Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain. List dates applied for and file numbers, if known.

None known

List any government approvals or permits that will be needed for your proposal, if known. If permits have been applied for, list application date and file numbers, if known.

- Clearing and grading permit – City of Bellevue.
- JARPA for Section 10 permit from US Army Corps of Engineers

- Hydraulic Project Approval from the Washington State Department of Fish and Wildlife.
- Coastal Zone Management compliance and Water Quality Certification from the Washington State Department of Ecology.
- Street right-of-way use permit – City of Bellevue. This will be submitted once the actual schedule is known.
- A Turbidity Monitoring Plan will be prepared for approval by the City of Bellevue.
- A noise variance may be sought to allow work beyond normal hours to reduce the total duration on-site requiring diversion of the stream.

Please provide one or more of the following exhibits, if applicable to your proposal. (Please check appropriate box(es) for exhibits submitted with your proposal):

- ☐ Land Use Reclassification (rezone) Map of existing and proposed zoning
- ☐ Preliminary Plat or Planned Unit Development Preliminary plat map
- ☒ Clearing & Grading Permit Plan of existing and proposed grading Development plans
- ☐ Building Permit (or Design Review) Site plan Clearing & grading plan
- ☐ Shoreline Management Permit Site plan

A. ENVIRONMENTAL ELEMENTS

1. EARTH

a) General description of the site:
☒ flat ☒ hilly ☐ steep slopes ☐ mountainous ☐ other

Topography within the vicinity of the project consists of flat, rolling and steep stream banks. The topography north and south of the creek crossing slopes towards the creek. The existing access route, located south of Kelsey Creek, gently slopes towards the northwest. The associated wetland located immediately east and south of the left bank of Kelsey Creek, is situated in a generally flat area that slopes towards the northwest.

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

Most of the project work area is on gently (0 to 15 percent) to moderately inclined (15 to 30 percent) gradients. The steepest slopes are inclined at gradients of greater than 100 percent to near vertical along the left bank of Kelsey Creek towards the western portion of the project area.

c) What general types of soils are found on the site (for example, clay, sand, gravel, peat, and muck)? If you know the classification of agricultural soils, specify them and note any prime farmland.

The majority of the soils in the project area have been mapped as Alderwood gravelly sandy loams of varying slopes (AgC) (United States Department of Agriculture Web Soil Survey).

The project does not cross farmland.

d) Describe the purpose, type, and approximate quantities of any filling or grading proposed. Indicate source of fill.

Excavation quantities include:

- Approximately 171 cubic yards will be excavated to install temporary access, route a water bypass pipe beneath an access route, regrade the stream bank at the 20-inch pipeline crossing for bank stabilization, excavation to install a concrete river weight at the 16-inch pipeline crossing, excavation to inspect potential scour beneath an existing weir (Weir #5) located within Kelsey Creek, excavation for installation of a new weir consisting of rock, and removal of a portion of an existing gabion located in the vicinity of the new weir.

Fill quantities include:

- Approximately 410 cubic yards of fill. A significant portion (about 210 cubic yards) will be placed temporary (and as needed) for construction staging areas, the construction entrance, and to address potential erosion along the access route. Some of this material may consist of hog fuel in lieu of quarry spalls or crushed rock which can be spread on-site and supplement mulch for restoration purposes. In addition, excavated material will be re-used on-site (e.g. rip rap removed for installation of the river weight and for inspection of Weir #5). Imported rock will be used to construct the new weir for fish passage and to protect the bank at the 20-inch petroleum product pipeline crossing. Additional rock may be needed to reduce the potential for future scouring beneath existing concrete Weir #5. Temporary fill for access will be pulled back or will be removed at the end of the project

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

The majority of the project site gently to moderately sloped (less than 30 percent). There is short-term potential for erosion during construction, particularly during periods of precipitation and for a period after construction as vegetation becomes re-established. Measures will be taken during construction to reduce the potential for erosion to occur and to capture and retain and stabilize sediment that becomes mobilized. The work will also be timed during periods where precipitation rates are low.

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

No change will be made.

g) Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

The potential for erosion will be reduced by implementing temporary erosion and sedimentation controls (TESC) in accordance with Best Management Practices (BMPs) as described in the Western Washington Stormwater Manual (Washington State Department of Ecology (2005) as well as those approved by the City of Bellevue. Erosion will be reduced by utilizing existing access, where possible, driving directly overland to access work sites, and by implementing temporary erosion and sediment control (TESC) measures along access and in work areas, as appropriate. The project will require equipment to track into the work area located along the left bank of Kelsey Creek beyond the existing access road. The Contractor shall review access plans with the Project Engineer or Project Geologist prior to driving into the project area, potential erosion hazard areas, wetlands, or stream buffer and wetland buffers.

Potential stormwater, erosion and sediment impacts during construction will be addressed using best management practices (BMPs) that are detailed in, but not limited to, the TESC Plan incorporated in the Grading Plans prepared for this project. These include erosion control barriers (i.e., silt fence), temporary construction entrances and temporary cover. In addition, the stream flow will be routed around work areas so that in-stream work can be accomplished in the dry. Olympic will monitor and review the use and maintenance of TESC measures employed throughout construction, and if needed, monitoring and maintenance of TESC measures may be transferred to **Olympic's** operating section upon completion of construction and restoration activities.

Permanent techniques and measures include hydroseeding with a native seed mix, replanting buffers with native vegetation and incorporating species such as willow (*Salix sp.*) stakes in areas where rip rap is used for bank protection.

The project will also maintain compliance with the following City of Bellevue performance standards:

- General Performance Standards for Repair and Maintenance (LUC 20.25H.055.C.1),
- Performance Standards for Streams (LUC 20.25H.080.A)

2. AIR

a) What types of emissions to the air would result from the proposal (i.e. dust, automobile odors, and industrial wood smoke) during construction and when the project is completed? If any, generally describe and give approximate quantities if known.

Construction Phase

Sources of emissions during construction include fugitive dust and construction equipment exhaust. Sources of dust will result from equipment traveling on the unimproved access road south of the project area. The quantities of emissions generated and transported off-site from the construction corridor will depend upon wind and weather conditions, but are anticipated to be minor and of short duration. Areas of exposed soils, created as a result of this project, outside of the existing corridor access road will be planted and mulched, eliminating future potential sources of dust.

Operational Phase

There are no long-term sources of air emissions associated with the operational phase of this project.

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

None, does not apply.

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

Standard emission control devices, in conformance with federal and state air quality standards for the specific class and type of equipment, will be utilized during construction phases of the project. As needed, dust control BMPs, including wetting of exposed soil surfaces and/or use of approved soil tackifiers, will be implemented by Olympics' contractor to limit dust-generating sources on unimproved road surfaces. Likewise, efficient construction practices and timely restoration of temporary disturbances will further reduce dust-generating sources. Olympic representatives will monitor dust-generating sources during construction and when necessary will address excessive emissions with appropriate control techniques.

3. WATER

a) Surface

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

  All aquatic resources identified within and adjacent to the project area lie within the Upper Lake Washington Basin. The project area is situated within the Kelsey Creek drainage basins. Kelsey Creek and associated wetlands are located within the project area. The mainstem of Kelsey Creek originates at Phantom Lake, located east of the project area; from the project area Kelsey Creek flows west to Lake Washington.

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

  Yes, stabilization of the left bank in the vicinity of the 20-inch pipeline crossing will be accomplished by regrading the slope to more stable inclination and protecting the toe of the slope with rip rap. Rip rap will be placed below the stream bed to reduce the potential for erosion at the toe of the bank. The remainder of sediment and any armoring will be removed upstream and downstream of the Weir #5 to evaluate if scour occurred beneath the concrete weir. If scour appears to have occurred, any voids will be backfilled with native glacial soils excavated for the construction of the rock drop structure or imported from off-site.. A geomembrane will be placed along the upstream and downstream faces of the weir, and then gravel and rip rap will be placed over the rip rap. In addition, rip rap will be selectively placed along toe of existing gabion baskets downstream of Weir #5 and the rock drop structure in areas where the bottom of the gabions are corroded and not protected by rip rap placed in 1995.

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

  Approximately 50 cubic yards for excavation and 80 cubic yards of fill is estimated within the channel of Kelsey Creek within the Ordinary High Water lines. Some excavated material will be re-used (e.g. existing rip rap and suitable stream bed material) but imported rock will be placed along the bank at the 20-inch pipeline crossing, for construction of the rock drop weir and to supplement existing rip rap along the bank and in the channel. Imported gravel for stream beds will also likely be imported.

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

  During construction, a temporary sand bag and concrete block barrier dam will be installed upstream of the project area to divert the stream around the project area and will be routed through a bypass system (pipe/hose) and discharge directly back into the stream through a tee-diffuser. It is anticipated that a 4- and 6-inch pump will be required to bypass the expected 4 cubic feet per second of stream flow.

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

  Yes, the proposed pipeline protection measures and fish passage mitigation measures are within the 100 year floodplain. The staging areas and access route are outside of the presently mapped 100-year floodplain.

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

  No waste will be discharged into surface waters. Temporary erosion and sediment control BMPs will prevent any discharges of waste materials to surface waters.

b) Ground

- **Will ground water be withdrawn, or will water be discharged to ground water? Give general description.**

  No groundwater will be withdrawn.

- **Describe waste material that will be discharged into the ground from septic tanks or other sources, if any** (for example: Domestic sewage; industrial, containing the following **chemicals**...; agricultural; etc.).

  No waste material will be generated.

- **Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.**

  Not applicable.

c) Water Runoff (including storm water):

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

  Storm water runoff is possible and quantities are unknown. Control of storm water runoff will be addressed using typical construction and erosion control techniques as detailed in project TESC Plan (i.e., silt fences, jute mats and hay/straw bales). Permanent techniques and measures include installing blankets/netting, mulching, straw wattles, seeding and/or replanting. It is anticipated that there will be no change in runoff patterns or rates after site restoration. The runoff, if any, will not flow into other waters.

- **Could waste materials enter ground or surface waters? If so, generally describe.**

  No waste materials will be generated by construction or operation of this project that could enter ground or surface waters with the exception from cutting concrete.

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

Runoff will be reduced by limiting the area of brushing and soil disturbance to the smallest area required for safe working conditions. Surface water is best controlled by installing filter fences, straw bales, sediment traps, trench and slope breakers or other erosion control devices as needed depending on site specific conditions. An additional measure to control runoff from disturbed areas would be to revegetate (hydroseed) disturbed area as soon as possible after project has been completed. Spill containment will be used for pumps used to bypass and dewater the stream channel during construction. Best management practices will be implemented for fueling equipment, storage of potential contaminants and to collect fluids and/or dust from saw cutting of concrete. Work areas where concrete cutting will occur will be dewatered prior to cutting, and wet/dry vacuum systems per best management practices will be implemented to control and collect fluids with concrete cuttings.

4. PLANTS

a) Check or circle types of vegetation found on the site:

- ☑ deciduous tree: alder, bigleaf maple and cottonwood
- ☑ evergreen tree: Douglas fir, western red cedar and shore pine
- ☑ shrubs: Himalayan blackberry, sitka willow, hardhack and salmonberry
- ☑ grass: reed canarygrass
- ☐ pasture
- ☐ crop or grain
- ☑ wet soil plants: Sitka willow, hardhack, salmonberry, small-fruited bulrush and soft rush
- ☐ water plants:
- ☒ other types of vegetation: Japanese knotweed

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

Clearing activities will be limited to brushing access along the existing route to the project area. The most common types of vegetation that will be removed will be invasive reed canary grass and noxious Japanese knotweed and Himalayan blackberry.

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

There are no threatened or endangered plant species known to be on or adjacent to the project site according to the Washington Natural Heritage Program (2006), and no sensitive plant species were observed during the wetland delineation survey.

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

Vegetation removal will be limited to the minimum required for access. Brushing will be limited in areas where vegetation conditions allow construction equipment to track over noxious and invasive species. Staging areas will be located outside of sensitive areas. All disturbed stream and wetland buffer areas will be revegetated using native vegetation appropriate for the on-site wetland and habitats.

To prevent the spread of noxious weeds, insects and soil-borne pests, construction equipment will be thoroughly cleaned prior to mobilization and prior to removal. If working within known weed and/or soil-borne pest infested area, special attention will be paid to preventing the spread of the weed and/or pest. Existing area of the site that is infested with noxious species will be cleared and the plant material will be removed from the site and disposed of at an appropriate facility.

5. ANIMALS

a) Check or circle any birds and animals which have been observed on or near the site or are known to be on or near the site:

☑ Birds: songbirds, other: woodpeckers, waterfowl
☑ Mammals: deer, squirrels, raccoons, mice, rats, opossums, gophers, moles, rabbits, skunks
☑ Fish: salmon, other:

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

National Marine Fisheries Service lists Chinook (*Oncorhynchus tshawytscha*) as a federally threatened species. There are no other threatened or endangered species known to be on or near the site.

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

Yes, Kelsey Creek support populations of anadromous fish that use these creeks for migration, spawning and rearing.

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

Any impacted areas within the wetland buffers will be replanted and/or seeded with native species or species that will promote the colonization by native plants. The seed mix will be selected based on availability and appropriateness of the mix for the time of application.

6. Energy and Natural Resources

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

The completed project will not require any energy.

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

No impacts on solar energy.

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

No energy conservation features are included.

7. Environmental Health

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

There is a potential risk from the normal hazards associated with machinery operation and general construction practices. Spills of machine fluids and/or similar and other normal construction hazards exist.

b) Describe special emergency services that might be required.

No special emergency services will be required for the completed project. In the event of a construction and/or operational emergency, appropriate response personnel may be required including, but not limited to personnel from Olympic, local police, fire, aid or rescue units.

c) Proposed measures to reduce or control environmental health hazards, if any.

Safety equipment and procedures will be utilized at the Olympic **contractor's discretion as required** by the Washington Industrial Safety and Health Act (WISHA), Occupational Safety and Health Administration (OSHA) and WAC 296-155 (*Safety Standards for Construction Work*). Sound engineering and construction techniques will ensure the proposed project is installed properly.

8. Noise

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

No noise will affect this project.

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

Short-term noise from the equipment.

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

All construction equipment will be equipped with standard sound attenuation devices and will meet **Ecology's noise guidelines and City of Bellevue's** noise standards. It is anticipated that construction will be limited to normal working hours as required **City of Bellevue's code**. However, to meet permit work windows, to reduce the amount of time spent dewatering on a daily basis (and thus overall project work time), it may be necessary to extend work over a weekend or weekends and/or to operate pumps to bypass water overnight.

9. LAND AND SHORELINE USE

a) **What is the current use of the site and adjacent properties?**

Current land uses of properties within the project corridor include the existing pipeline and Puget Sound Energy (PSE) transmission line corridor that is situated within single family and multi family residential areas, office and commercial zoned areas.

b) **Has the site been used for agriculture? If so, describe.**

No

c) **Describe any structures on the site.**

There are no structures on site.

d) **Will any structures be demolished? If so, what?**

No

e) **What is the current zoning classification of the site?**

According to the City of Bellevue Generalized Zoning Map, the project corridor is situated in single family and multi family residential, office, commercial and light industrial designated areas.

f) **What is the current comprehensive plan designation of the site?**

N/A

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

This portion of Kelsey Creek is not within the Shoreline Master Program.

h) **Has any part of the site been classified as an "environmentally sensitive" area? If so, specify.**

Yes, landslide hazard and steep slope hazard areas, a wetland and Kelsey Creek which is documented spawning and rearing habitats for federally listed threatened Chinook salmon, occurs within the project area.

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

No habitable structures will be constructed as a part of this project.

j) **Approximately how many people would the completed project displace?**
None, does not apply.

k) **Proposed measures to avoid or reduce displacement impacts, if any:**
None proposed.

l) **Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any.**
None, does not apply.

10. Housing

a) **Approximately how many units would be provided, if any? Indicate whether high, middle or low-income housing.**
None, does not apply.

b) **Approximately how many units, if any, would be eliminated? Indicate whether high, middle or low-income housing.**
None, does not apply.

c) **Proposed measures to reduce or control housing impacts, if any:**
None, does not apply.

11. Aesthetics

a) **What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?**
None, does not apply.

b) **What views in the immediate vicinity would be altered or obstructed?**
None, does not apply.

c) **Proposed measures to reduce or control aesthetic impacts, if any:**
None, does not apply.

12. Light and Glare

a) **What type of light or glare will the proposal produce? What time of day would it mainly occur?**
None, except incidental glare form equipment during work; should not impact anyone.

b) **Could light or glare from the finished project be a safety hazard or interfere with views?**
None, does not apply.

c) **What existing off-site sources of light or glare may affect your proposal?**
None, does not apply.

d) **Proposed measures to reduce or control light or glare impacts, if any:**
None, does not apply.

13. Recreation

a) **What designated and informal recreational opportunities are in the immediate vicinity?**
None.

b) **Would the proposed project displace any existing recreational uses? If so, describe.**
None, does not apply.

c) **Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:**
None, does not apply.

14. Historic and Cultural Preservation

a) **Are there any places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the site?** If so, generally describe.
None known.

b) **Generally describe any landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site.**
No known archaeological sites or historic properties are located within the project corridor.

c) **Proposed measures to reduce or control impacts, if any:**
The proposed project is located outside of known historic resources. If a potential site were encountered during construction, activities would be halted and local authorities and DAHP would be notified immediately. Construction would remain halted at the site until proper measures and procedures have been taken. Prior to resuming construction, mitigation measures would be undertaken as deemed necessary by consultation with DAHP.

15. Transportation

a) **Identify public streets and highways serving the site, and describe proposed access to the existing street system. Show on site plans, if any.**
See the attached Figures for the location of adjacent public streets and highways serving the site. The site will be accessed off of 136th Ave. NE, within the utility easement and along a portion of the unimproved 136th Avenue NE right-of-way owned by the City of Bellevue.

b) **Is site currently served by public transit? If not, what is the approximate distance to the nearest transit stop?**

No.

c) **How many parking spaces would the completed project have? How many would the project eliminate?**

None, does not apply.

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

Access from public roads will be along the existing utility easement and unimproved street right-of-way. Any improvements to undeveloped lands will be temporary and lands will be restored.

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

None, does not apply.

f) **How many vehicular trips per day would be generated by the completed project? If known, indicate when peak volumes would occur.**

Impacts will be temporary during the course of the project to mobilize and demobilize equipment, for delivery of materials, transport of workers to and from the site, and for export of soils excavated from on-site. It is anticipated to be an average of 5 and 10 trips per day over a 2 to 3 week period.

g) **Proposed measures to reduce or control transportation impacts, if any:**

None, does not apply. A street-use permit will be applied for. No special traffic control plan is anticipated as the primary staging area is at the end of a dead end road.

16. Public Services

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

None, does not apply.

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

None, does not apply.

17. Utilities

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

Does not apply.

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

None; does not apply.

SIGNATURE

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

Signature: ..... Tony Cotton .....

Date Submitted: ..... 7/2/09 .....

REFERENCES

GeoEngineers, 2009a, "Geotechnical Design Report, M.P. 99 – Kelsey Creek Crossing and Fish Passage Mitigation, Bellevue, Washington" (GeoEngineers, June 22, 2009).

GeoEngineers, 2009b,"Critical Areas Report, M.P. 99 – Kelsey Creek Crossing and Fish Passage Mitigation, Bellevue, Washington" (GeoEngineers, June 22, 2009).

GeoEngineers, 2009c "Biological Evaluation, M.P. 99 – Kelsey Creek Crossing and Fish Passage Mitigation, Bellevue, Washington" (GeoEngineers, June 22, 2009).

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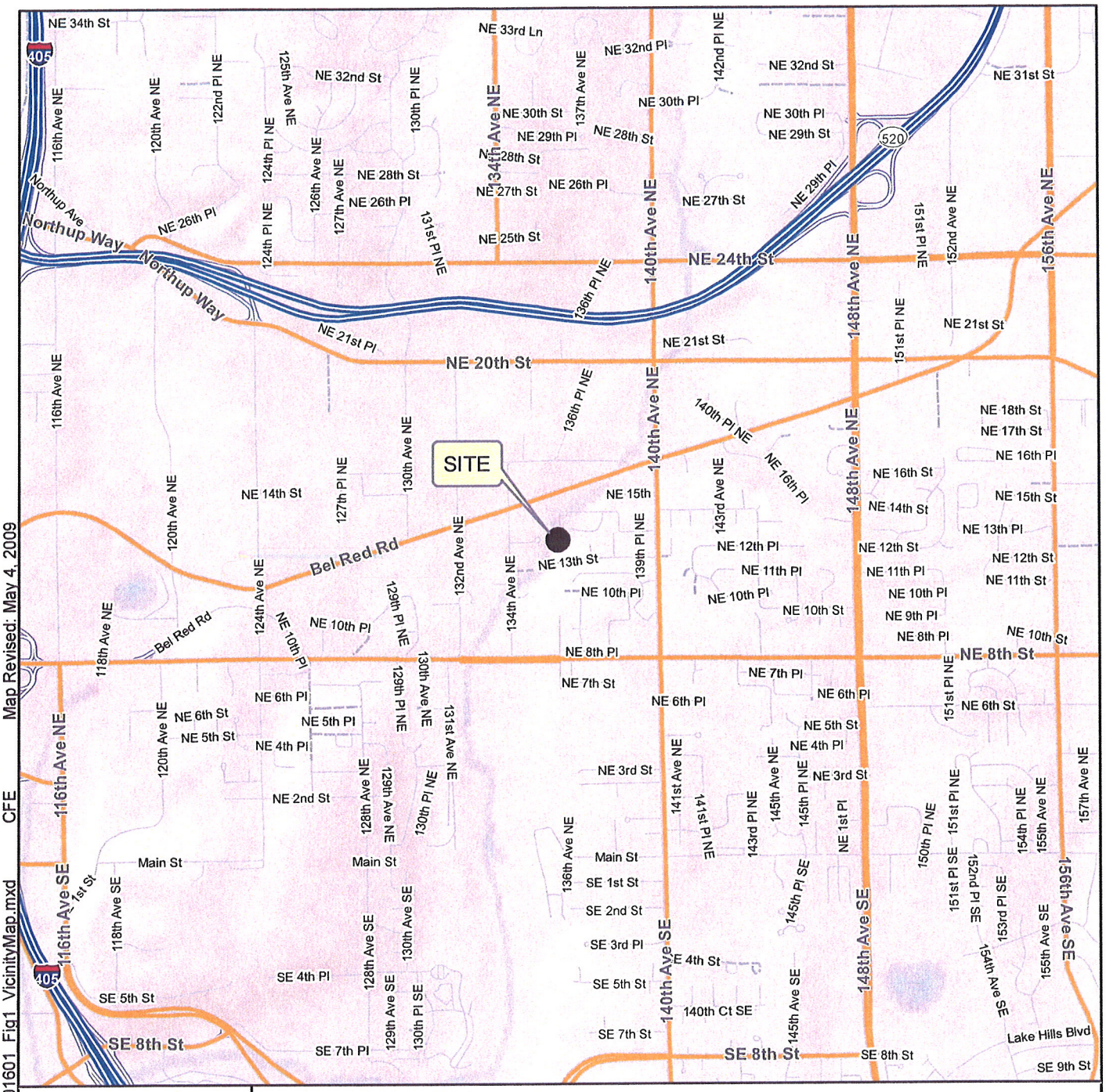
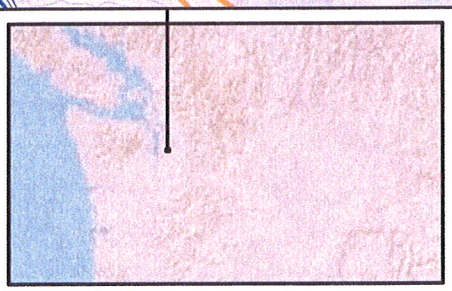
United States Department of Agriculture Web Soil Survey. http://websoilsurvey.nrcs.usda.gov/app/ (Accessed on April 2009)





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Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. can not guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.
3. It is unlawful to copy or reproduce all or any part thereof, whether for personal use or resale, without permission.

Data Sources: ESRI Data & Maps, Street Maps 2005

Transverse Mercator, Zone 10 N North, North American Datum 1983
North arrow oriented to grid north

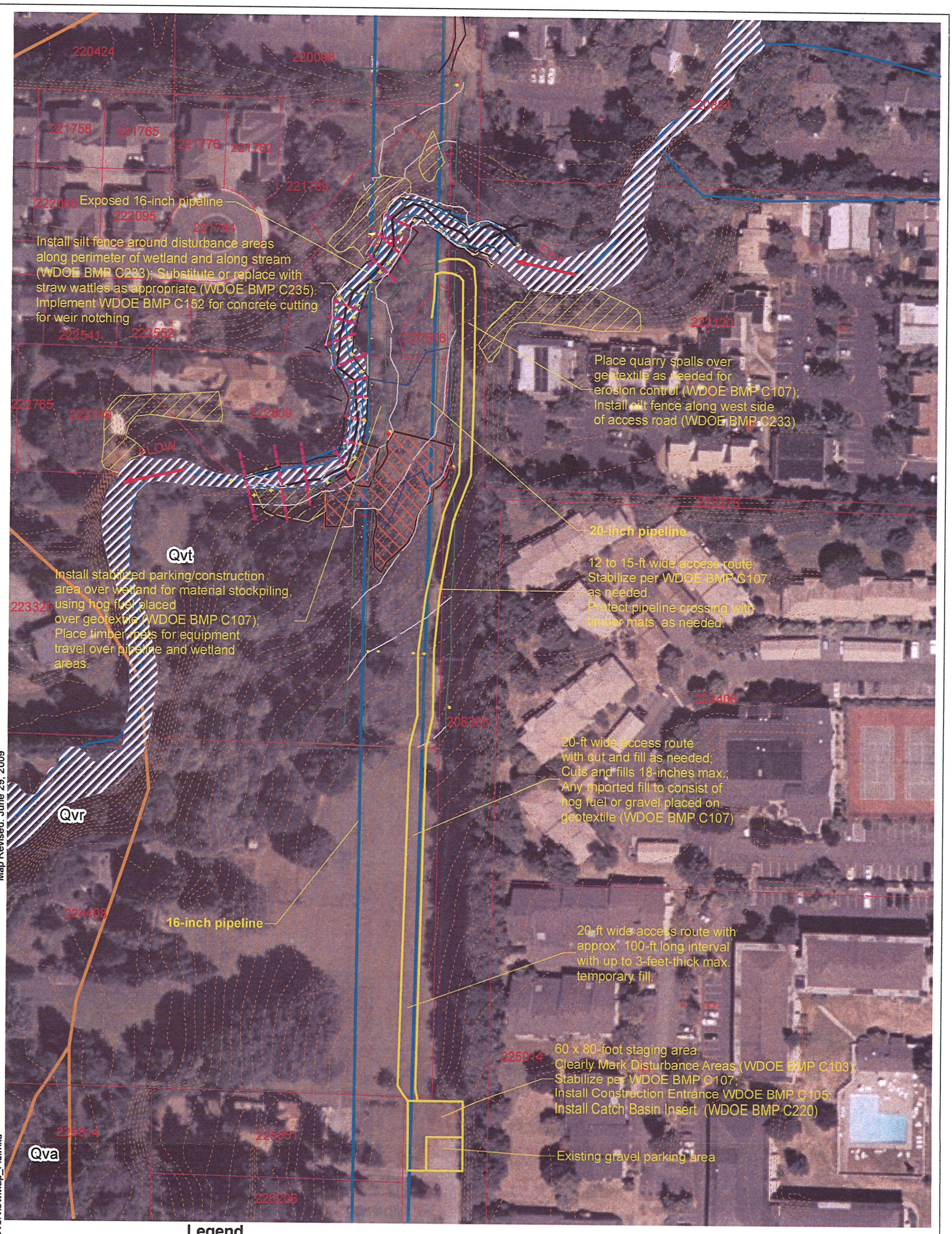
Vicinity Map

Olympic Pipe Line Company
Kelsey Creek Pipeline Protection Project
Bellevue, Washington

GEOENGINEERS

Figure 1

Office: RED Path: \\Red\projects\0\0894016\GIS\089401601 Fig1 VicinityMap.mxd CFE Map Revised: May 4, 2009



Map Revised: June 29, 2009

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Legend

- Pipeline
- **Geohazards**
  - Landslide
  - Steep Slope
- **Wetland**
  - Delineated Wetland Edge
  - 100-Year Floodplain

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Notes:
1. The locations of all features shown are approximate.
2. Floodplain boundary from a GIS file titled "FLDPLAIN.shp" from City of Bellevue, dated April 21, 2009.
3. 2-Foot Topographic contours from a GIS shape file titled "CONTOUR2FT.shp," developed from LiDAR data from City of Bellevue, dated May 1, 2007.
4. Pipeline alignment from a GIS shape file titled "OILPIPES.shp." from City of Bellevue, dated May 1, 2007.
5. Steep slope and landslide hazards mapped by GeoEngineers (this study); May be limited to within approximately 300 feet of project.
6. Data presented using Washington State Plane North (feet), NAD1983.
7. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. can not guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

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Overview Map

Olympic Pipe Line Company
MP 99 - Kelsey Creek Crossing
Belleive, Washington

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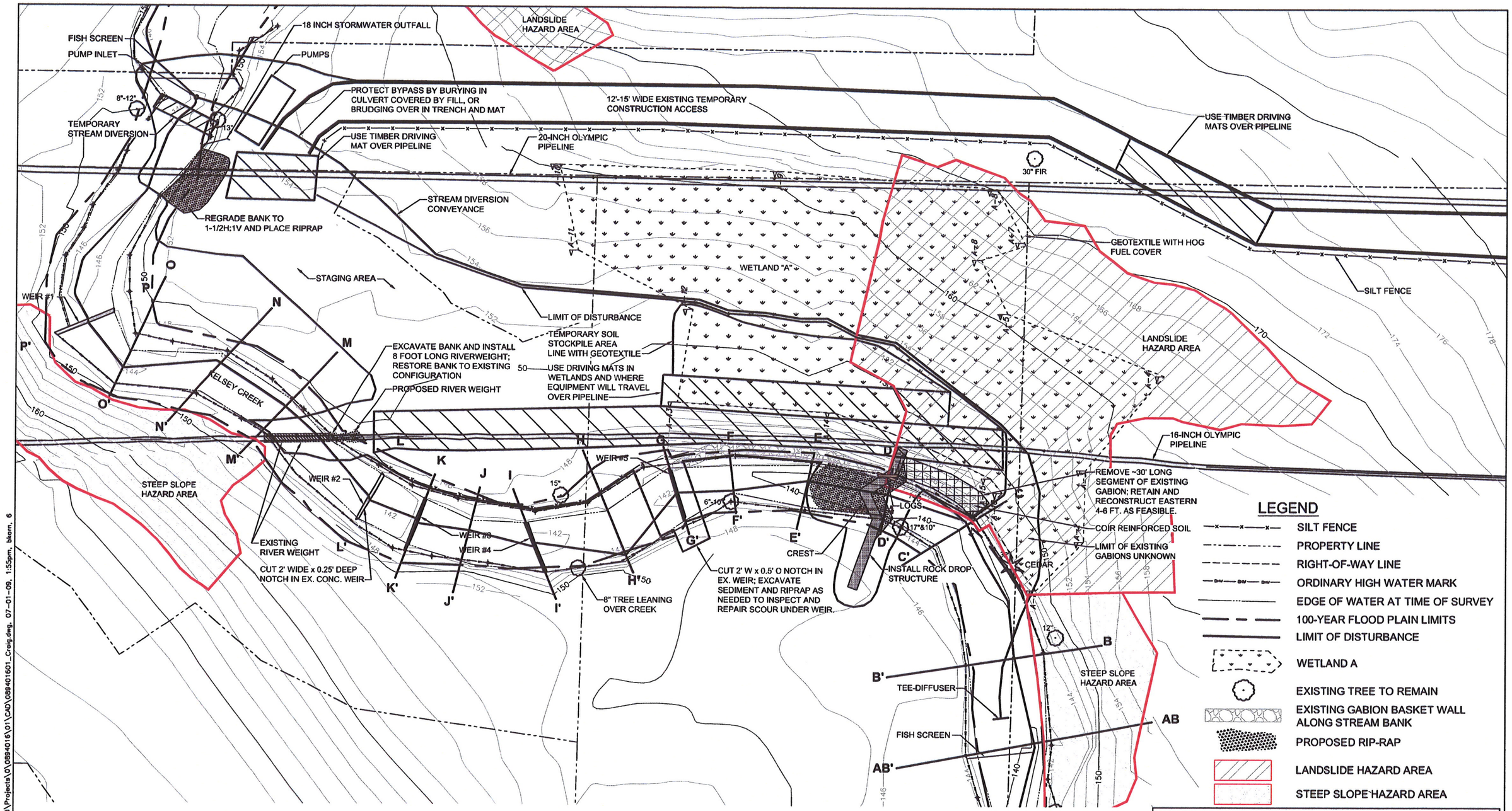
Figure 2



Notes:
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Reference: Drawing provided by Olympic Pipe Line Company.

Site Plan

Olympic Pipe Line Company
Kelsey Creek Crossing and Fish Passage Mitigation
Bellevue, Washington

GEOENGINEERS

Figure 3

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CRITICAL AREA REPORT AND RESTORATION PLAN
M.P. 99 - KELSEY CREEK CROSSING AND FISH PASSAGE MITIGATION
BELLEVUE, WASHINGTON

JUNE 22, 2009

FOR
OLYMPIC PIPE LINE COMPANY

GEOENGINEERS

Critical Area Report and Restoration Plan
M.P. 99 - Kelsey Creek Crossing and Fish Passage Mitigation
Bellevue, Washington
File No. 0894-016-01

June 22, 2009

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Appendix B – Wetland Datasheets
Appendix C – Wetland Rating Form
Appendix D – Special Conditions for Instream Habitat Design Engineering Services

CRITICAL AREA REPORT AND RESTORATION PLAN
M.P. 99 - KELSEY CREEK CROSSING AND FISH PASSAGE MITIGATION
BELLEVUE, WASHINGTON
FOR
OLYMPIC PIPE LINE COMPANY

1.0 INTRODUCTION AND PROJECT UNDERSTANDING

This report presents the results of our critical area assessment and a restoration plan for the Olympic Pipe Line Company (Olympic) Kelsey Creek Crossing and Fish Passage Mitigation Project (project) located at Kelsey Creek about 600 feet south of Bellevue-Redmond Road (Bel-Red Road) in Bellevue, Washington (Figure 1). The purpose of this report is to assess critical areas, as defined by the City's Land Use Code (LUC) 20.25H, that occur within 300 feet of the site and evaluate the potential impacts of the project as required by LUC 20.25H.230. In accordance with LUC 20.25H.210, a restoration plan to restore the areas that will be temporarily disturbed as a result of the project is included within this report.

Olympic operates a 16-inch-diameter and 20-inch-diameter petroleum products pipelines through the approximately 100-foot-wide pipeline easement (within an open easement) that runs north-south through residential and business properties within the City of Bellevue (City). The two underground pipelines run parallel to eachother and are approximately 80 feet apart within the 100-footwide easement. The ground surface is generally flat to gently rolling. Kelsey Creek crosses the easement roughly perpendicular to the 20-inch pipeline and at an oblique angle to the 16-inch pipeline (Figure 2). The channel and banks of Kelsey Creek have been highly modified in the past by development and urbanization. The creek has been confined within the vicinity of the pipeline crossings by bank stabilization measures including rip rap and gabion baskets.

In 1995, Olympic installed grade control structures and stream bank stabilization measures at the pipeline crossings to gain cover over the 16-inch pipeline, which was exposed at that time. Five precast concrete weirs were installed in Kelsey Creek to prevent erosion and enable sediment to build behind the weirs, raising the grade of the existing stream bed to gain cover over the pipeline. Shallow pools were constructed upstream of the weirs and deeper plunge pools were constructed downstream of the weirs. The bottoms of the pools were lined with geotextile fabric. The filter fabric was then covered with rip rap and/or gravel. Approximately 150 cubic yards of rip rap was placed along the left bank at least 1 foot above the high water elevation to reduce erosion and provide a buttress for the slope. Rip rap was also placed upstream of the weirs where the weirs are keyed into the bank.

A small section of the Olympic 16-inch diameter product pipeline, approximately 1-foot long, has recently been exposed in the channel by stream scour near the left (south) bank of the Kelsey Creek crossing. The pipeline was discovered to be exposed within Kelsey Creek by City of Bellevue representatives during spawning surveys in the early winter of 2007. It appears that significant storm events over the past two years have resulted in flood-level flows within the creek that have caused scour and erosion along the banks, including the areas of the 16-inch and 20-inch pipelines. In addition, it appears that some scour has occurred in proximity to at least one (Weir #5) of five weirs (Figure 3) installed in 1995.

In 1995, a river weight (concrete half-round pipe) was installed over a portion of the 16-inch pipeline at the creek crossing and protects the pipeline from stream flows and exposure to other elements. However the section of pipe along the left bank, which was previously buried within the bank and stream bed, does

not have the river weight protective measure and therefore needs additional protection (maintenance repair).

In addition to the exposed section of pipe, there is bank scour in the vicinity of the 20-inch line, just downstream from an existing 18-inch diameter concrete stormwater outfall pipe. Representatives from the Washington State Department of Fish and Wildlife (WDFW) have also expressed concern about fish passage across the weirs installed in 1995 by Olympic. In some areas, scour has also exposed and/or loosened geotextile placed over native soils during the weir installation project.

1.1 PROJECT LOCATION

The site is located in Section 27, Township 25N, Range 5E within the Olympic easement at the Kelsey Creek crossing, approximately 600 feet south of Bel-Red Road. The Olympic easement is located within an undeveloped utility corridor that also contains two electrical transmission circuits and a fiber optic line mounted on wooden H-poles, operated by Puget Sound Energy (PSE).

1.2 PROJECT DESCRIPTION

The purpose of the project is to protect the exposed 16-inch pipeline from corrosion, impact from rocks or other objects, vandalism, the elements, or other possible hazards from exposure. Since active erosion is also occurring along the left bank where the 20-inch pipeline crosses the creek, additional bank protection measures will be completed. Lastly, fish passage concerns will be addressed by notching two of the existing concrete weirs and installing a rock drop structure using rock (rip rap). The work will require bypassing stream flows and dewatering segments of the stream where work is to occur.

A temporary quarry spall construction entrance to the work area will be installed from the paved road and the primary staging area at the north end of 136th Avenue NE. The access along the pipeline right-of-way and existing access along City right-of-way will likely require temporary cuts and fills from the primary staging area for a distance of about 440 feet. The entire access route may be covered with geotextile and temporary gravel, quarry spall fill or hog fuel; the contractor may also select timber driving mats to provide a running surface and reduce ground disturbance. Timber mats will also be used along crossings of the pipelines. We anticipate at least two track-mounted excavators, dump trucks or track-mounted dump trucks (e.g. Morookas), a loader and other equipment (as needed) will be mobilized to the site via the temporary construction access road.

Federal pipeline safety regulations found in 49CFR195 require that the pipeline be buried or be covered with equivalent protective measures. BP, the owner-manager of Olympic, has concluded that a concrete river weight, such as that proposed for this project, provides equivalent protection. Therefore, Olympic is proposing to protect the 16-inch pipeline by installing an additional river weight (concrete half-round pipe) over the unprotected section of the 16-inch pipeline in the left (south) bank of the creek and south of the existing river weights. The total length of the new river weight will be about 8 feet so that the protection extends into the bank about 7 feet. In order to install the river weight, it will be necessary to stage a trackhoe on the left bank to remove the rip rap from over and around the 16-inch pipeline along the left bank, then place the river weight over the pipeline. The rip rap will be replaced to its original configuration along the left bank over the pipeline.

Concerns regarding fish passage across the existing weirs will be accomplished by cutting notches in Weirs #2 and #5 and installing a rock drop structure downstream of Weir #5. The notch in Weir #2 will be approximately 2 feet wide and 0.25 feet deep. The notch in Weir #5 will be approximately 2 feet wide and 0.5 feet deep. The rock drop structure will be constructed about 60 feet downstream of Weir #5, with a crest height about 0.5 feet below the base of the notch in Weir #5. Construction of the rock drop

structure will require removing a section of an existing gabion basket system to tie in the right bank key. Depending on the extent of gabion system removed and proximity of the stream bank to the pipeline, a buried wing wall will be constructed within the footprint of the gabion basket system between the pipeline and the top of stream bank. It is anticipated that the buried wing wall will extend downstream a maximum of about 25 feet from the rock drop structure. The extent of the gabion removed will be determined in the field at the time of construction. Woody debris consisting of two logs will be embedded in the rock drop structure extending downstream a maximum distance of 10 feet. One will be placed along the left bank and one with a small root wad will be placed in the right side of the rock drop structure, near the right bank.

During the time that work is being accomplished to address fish passage concerns, sediment upstream of Weir #5 will be removed so that a grocery cart embedded in the stream bottom can be removed. The remainder of sediment and any armoring will be removed upstream and downstream of the weir to evaluate any scour that might have occurred beneath the concrete weir. Any voids will be backfilled with native glacial soils excavated from on-site or using imported clay soils. Geomembrane will be placed along the upstream and downstream faces of the weir. Rip rap will be placed over the geomembrane, and the excavated stream sediments will be placed over the rip rap to pre-existing grades. In addition, rip rap will be selectively placed along toe of existing gabion baskets downstream of Weir #5 and upstream of the rock drop structure in areas where the bottom of the gabions are corroded and not protected by the rip rap placed in 1995.

Pursuant to City LUC 20.25H.055.B, certain uses and development may be allowed inside a critical area, critical area buffer, or critical area setback. Among these uses and activities include repair and maintenance of existing utility facilities, utility systems, stormwater facilities, and essential public facilities. A portion of this work constitutes maintenance activities. It is our understanding that the work related to fish passage across the weirs may not be considered maintenance activity, although the weirs were installed in the mid-1990s in part to restore cover, to help protect the pipelines as well as to restore and maintain fish passage.

1.3 General Site Description

The area at the project site is characterized by a creek crossing the undeveloped utility corridor. Topography within the vicinity of the project is flat to rolling. The low point along the alignment is at the crossing of Kelsey Creek at approximate Elevation 144 feet, while the high point within the project area of approximate Elevation 208 feet is located the end of the asphalt concrete paved access on 136th Avenue NE. Land use surrounding the site is single-family and medium density residential and light commercial as shown on Figure 2. There are no structures at the site. Photos showing site conditions are included in Appendix A of this report.

The utility corridor contains a variety of native and exotic vegetation species such as shore pine (*Pinus contorta*), salmonberry (*Rubus spectabilis*), Himalayan blackberry (*Rubus armeniacus*) and Japanese knotweed (*Polygonum cuspidatum*). The areas east and west of the utility corridor are a typical urban forested riparian corridor consisting primarily of native species such as western red cedar (*Thuja plicata*), black cottonwood (*Populus balsamifera*), Douglas fir (*Pseudotsuga menziesii*), salmonberry (*Rubus spectabilis*) and sword fern (*Polystichum munitum*).

2.0 METHODS

2.1 WETLAND EVALUATION

To prepare for the wetland field investigations, GeoEngineers conducted a search for pertinent and applicable literature and digital data. Data sources that we reviewed for this wetland assessment included: National Wetlands Inventory (NWI) digital data from U.S Fish and Wildlife Service (USFWS) (USFWS, 2008); digital soils data from the Natural Resource Conservation Service (NRCS) (USDA, 2008a and 2008b); and the King County iMap GIS system (King County, 2008). We also reviewed the City of Bellevue's Sensitive Areas Notebook to determine the presence of known wetlands at or near the site that have been inventoried by the City (City of Bellevue, 1987).

A wetland boundary was delineated within the Olympic easement by a GeoEngineers wetland biologist on October 14, 2008. Where permission to access private property was not given, our wetland investigations were restricted to "over the fence" visual observations. The wetland delineation was conducted in general accordance with wetland delineation procedures outlined in the U.S. Army Corps of Engineers (USACE) *Wetlands Delineation Manual* (USACE, 1987), *The Interim Regional Supplement* (USACE, 2008) and the Washington State Department of Ecology (Ecology) *Washington State Wetlands Identification and Delineation Manual* (Ecology, 1997). We gathered information on vegetation, soil and hydrology at plots located in the wetland and the adjacent upland area. Data obtained at these representative locations were recorded on standard wetland data sheets that are included in Appendix B. We identified the locations of the sample plots and the delineated wetland boundary with field flagging. The locations of the field flagging were subsequently professionally surveyed by Pacific Geomatic Services on October 20, 2008.

In accordance with LUC 20.25H.095 (B) and 20.25H.110 (B)(3), GeoEngineers conducted a wetland rating and functional assessment to determine regulatory requirements for the identified wetland area and to characterize and describe the functions, structures, and values exhibited by the wetland at the site. The wetland rating and functional assessment was determined with guidance from the *Washington State Wetland Rating System for Western Washington* (Hruby, 2006). A complete wetland rating form is included in Appendix C.

2.2 STREAMS

During the wetland delineation, GeoEngineers conducted a stream reconnaissance in the vicinity of the site. Prior to the field assessment, we reviewed the Washington Department of Natural Resources (WDNR) FPARS mapping system (WDNR, 2008), WDFW's SalmonScape system (WDFW, 2008), the King County iMap GIS system (King County, 2008) and the City of Bellevue's Sensitive Areas Notebook (City of Bellevue, 1987).

As part of our field work, we conducted a general stream survey of Kelsey Creek within the utility corridor and the areas immediately up and downstream of the project area. Data collected during the stream survey included observations of stream channel configuration; riparian structure including land use and vegetation; channel morphology and bank stability; substrate composition; observations of large woody debris and pool quality; observations of fish habitat and utilization; and digital photographs. We also delineated the Ordinary High Water Mark (OHWM) of Kelsey Creek within the project reach to determine the jurisdictional extent of Kelsey Creek. OHWM determinations were made using guidance from Olson and Stockdale (2008).

2.3 Geologic Hazard Areas

To determine the presence of potential Geologic Hazard Areas at the site we reviewed the Sensitive Areas Noteboook (City of Bellevue, 1987); and publicly available topographic data developed from LiDAR from the City of Bellevue (2007) and King County (2008). GeoEngineers obtained additional topographic data of the site from a survey conducted by Pacific Geomatic Services.

While on site to conduct the wetland and stream assessment, we also completed a geologic reconnaissance of the site and slopes adjacent to the pipeline crossing. The reconnaissance included observations and measurements of slope inclination, slope shape, vegetation, groundwater seepage, shallow landslides and other signs of potential slope or soil instability.

2.4 Habitats Associated with Species of Local Importance

We reviewed WDFW Priority Habitats and Species (PHS) data (2009) to determine the potential presence of priority fish and wildlife and their habitat near the site. While on site, GeoEngineers assessed the habitat that exists near the project area. This assessment included observations of vegetation type and structure; habitat connectivity and interspersion; and the proximity, frequency and magnitude of geomorphic and land use disturbance. Observations made during this site assessment were used to determine the presence of potential habitat that may have a primary association with the Species of Local Importance listed in LUC 20.25H.150 (A). Additional information regarding the presence of federally-listed threatened and endangered species is included in the Biological Evaluation (GeoEngineers, 2009a) that has been prepared for the project.

2.5 Areas of Special Flood Hazard

GeoEngineers has performed a flood hazard review of the site in accordance with LUC 20.25H.175. GeoEngineers has reviewed the Federal Emergency Management Agency (FEMA) Flood Insurance Rates Maps (FEMA, 1995). GeoEngineers was provided a copy of the HEC-RAS model of the subject reach by the City of Bellevue. We also obtained a copy of recent digital data in Geographic Information System (GIS) format that presents the 100-year floodplain mapping (City of Bellevue, 2009) (Figure 5).

GeoEngineers has determined areas at the site that are subject to the 100-year flood using a HEC-RAS modeling tool. Flood hazard review methods and results for the project are discussed in detail in the Hydraulics and Hydrology Report (GeoEngineers, 2009c).

3.0 RESULTS

3.1 Wetlands

Neither the NWI data (USFWS, 2009) (Figure 4) nor the King County iMap system (2009) indicates the presence of any wetlands on or near the site. The City of Bellevue (1987) has mapped an approximately 7-acre palustrine forested wetland, identified as the Crabapple Wetland, approximately 700 feet west of the project site. GeoEngineers identified one wetland at the project site during field investigations as shown on the Critical Area Map (Figure 5). For the purposes of regulatory application and in accordance with guidance set forth in *Washington State Wetland Rating System for Western Washington* (Hruby, 2006), we identified this slope wetland unit as Wetland A.

Wetland A is approximately 0.26 acres (11,477) square feet and is located immediately east of the left bank of Kelsey Creek. We have classified this wetland as a saturated, palustrine shrub and emergent wetland (PSSB/PEMB), based upon the dominant shrub community observed on the east side of the

wetland and the reed canarygrass (*Phalaris arundinacea*) dominated area on the west side of the wetland, as well as the apparent duration of inundation within the wetland (Cowardin et al., 1979).

3.1.1 Wetland Hydrology

The hydrology of Wetland A appears to be primarily driven by groundwater discharging from the slope along the southern and eastern edges of the wetland. Because of its position in the landscape, it also receives runoff from the surrounding area. With the exception of the maintained pipeline easement, the vegetative cover upgradient of the wetland consists of dense forest and shrub species, so overland flow into the wetland appears to be minimal. Surface water, discharging from several seeps in the hillside sheet flows down the slope towards the creek immediately west of the wetland. This flow infiltrates into the gabions that were installed to protect the pipeline on the left bank of the creek. Because the lowest surface elevation of the wetland is located approximately 6 vertical feet higher than the OHWM of the creek, it does not appear that the wetland is subject to overbank flooding from the creek. We observed standing water with iron deposits in the wetland during the October 14, 2009 wetland delineation and during a subsequent site visit on May 26, 2009. These iron deposits indicate a prolonged period of saturation within the wetland.

3.1.2 Hydric Soils

The NRCS soil data (USDA, 2008a) identifies the mapped soil unit as Alderwood gravelly sandy loam, 6 to 15 percent slopes. This soil is not listed as hydric by NRCS except in depressional landforms (USDA, 2008b). Soils mapped at the site by NRCS are shown in Figure 6. Within Wetland A, we observed very dark gray (10YR 3/1, according to Kollmorgen Corporation, 1988) loam with sand that was saturated to the surface. Redoximorphic features were present; however; their small size and soil saturation made it difficult to obtain a color of these features. Soil observed within the wetland is not consistent with the typical soil profile of the mapped soil series (USDA, 2008a). It should be noted that the soils within the wetland have been disturbed as a result of ongoing pipeline maintenance activities since the pipeline was installed in the mid 1960's. Hydric soils were not observed where gabions have been installed along the left bank of the creek, and as such, the wetland was not identified to extend to the creek.

3.1.3 Hydrophytic Vegetation

Vegetation observed within the maintained Olympic corridor portion of Wetland A is hydrophytic emergent species dominated by reed canarygrass. To a lesser extent, small-fruited bulrush (*Scirpus microcarpus*) and soft rush (*Juncus effusus*) also occurs within the maintained pipeline corridor. The wetland area outside of the maintained pipeline corridor is a well developed scrub/shrub wetland habitat characterized by Sitka willow (*Salix sitchensis*), salmonberry, hardhack (*Spirea douglasii*) and red-osier dogwood (*Cornus sericea*).

3.1.4 Wetland Buffer

The buffer surrounding Wetland A is relatively undisturbed with the exception of the 20-foot-wide corridor over both the 20-inch and 16-inch pipeline which is mowed annually by Olympic. PSE does manage the vegetation under the transmission lines within the buffer of Wetland A; however, only trees that could strike the transmission lines are selectively removed and this maintenance occurs infrequently. The wetland buffer within the utility corridor is well vegetated; however, invasive species such as Himalayan blackberry, reed canarygrass and Japanese knotweed dominate these areas. Outside of the maintained utility corridor, typical forested riparian habitat is found within the wetland buffer. Vegetation within the forested buffer consisting primarily of native species such as western red cedar

(*Thuja plicata*), black cottonwood, Douglas fir, salmonberry and sword fern. No structures or paved areas are found within approximately 80 feet of the wetland edge.

3.1.5 Wetland Rating and Functional Assessment

For the purpose of rating the wetland and assessing functions, we classify Wetland A as a slope wetland (Hruby, 2006). The principal function performed by Wetland A is to provide habitat benefits. Habitat scores are moderate; Wetland A scored 17 of a possible 36 points. Wetland A has two vegetation classes; shrub and emergent habitat (Cowardin, 1979). Native plant species are diverse and non-native vegetation species are generally not present within the wetland; however, invasive and exotic species are found throughout the buffer in the maintained utility corridor. Native species within the wetland include red alder (*Alnus rubra*), black cottonwood, Sitka willow, hardhack, small-fruited bulrush and soft rush. A number of red alder snags were observed within the wetland underneath the PSE transmission lines that were presumably being used by birds for foraging and nesting. Birds nest were also observed in the shrub layer of the wetland, particularly within the hardhack. The wetland is connected to other fish habitats and does not provide fish habitat within the wetland. While the wetland does not provide fish habitat within the wetland, it is part of the vegetated riparian corridor that contains spawning and rearing habitat for salmonids.

We scored Wetland A 6 points for water quality functions of a possible 32 points on the rating form. Slope wetlands, such as Wetland A, generally score very low for water quality functions because their sloped configuration does not provide adequate residency time to remove pollutants and their groundwater source of hydrology generally does not contain pollutants that provide the wetland the opportunity to perform water quality functions. Average slope in the wetland is between 2-5 percent and groundwater discharge is the primary source of hydrology.

Similar to water quality functions, slope wetlands typically score very low for hydrologic function because they do not attenuate flows and they do not typically receive stormwater input and as a result, hydrologic scores for Wetland A are low (5 points). Wetland A does have dense, uncut, rigid vegetation that would slow flood waters in greater than 50 percent of the wetland; however the wetland does not receive overbank flow from the creek. Wetland A does drain through the gabions to Kelsey Creek which has flooding problems downstream of the site; however, according to Hruby (2006), Wetland A does not have the opportunity to reduce flooding and erosion because the major source of water in the wetland are groundwater seeps.

Applying the rating criteria, Wetland A was rated a Category IV wetland, scoring 28 points on the rating form (Hruby, 2006). The complete rating form is provided in Appendix C. According to LUC 20.25H.095 (C)(1)(a)(i), the City requires a standard wetland buffer width of 40 feet landward from the delineated edge of Wetland A.

3.2 STREAMS

GeoEngineers scientists conducted site reconnaissance to confirm the presence of streams as defined by LUC 20.25H.075 (A) located within the immediate vicinity of the project area. Kelsey Creek is the single stream feature identified during our site investigation.

Kelsey Creek is the primary stream system that drains the heavily urbanized area of eastern Bellevue. The Kelsey Creek Basin is composed of several streams which flow to Mercer Slough south of SE 8th Street and immediately west of Interstate 405. The mainstem Kelsey Creek has its headwaters in the Phantom and Larsen Lake wetlands, approximately 3.5 miles southeast of the project site. The

contributing basin to the stream is approximately 10,870 acres (Kerwin, 2001) and land use within the watershed is a mix of residential and commercial development. Tributaries to Kelsey Creek include Valley Creek, the west tributary of Kelsey Creek and Richards Creek (WDFW, 2008 and 2009).

The subject reach of Kelsey Creek, shown on the site plan (Figure 3) is a highly altered, confined Type F stream (Rosgen, 1996) with a 1.3 sinuosity ratio and approximately 0.5 percent channel slope in the project reach. The substrate within the subject reach is predominantly cobble, gravel and sand. The banks have been armored with rip rap and concrete grade control weirs have been installed in the project reach as a protective measure for the Olympic pipelines. The result is a stable series of plunge and backwater pools immediately upstream and downstream of the weirs and low gradient riffles and glides between the weirs. Where the banks have not been armored, the banks are composed of erodible alluvial soils or compact glacial outwash over the native glacial till. The glacial till is exposed in portions of the channel. The compact glacial outwash soils are more resistant to erosion than the alluvial deposits, but less resistant than the glacial till. The till is extremely hard and resistant to erosion from the creek.

The section of stream channel just downstream of the 16-inch pipeline is also highly altered and controlled by concrete weirs. This reach is characterized by a broadly bending channel with pools below each weir and sand and gravel depositional pockets upstream of each weir. In particular, Weir #4 and #5 have created backwater conditions within the sections immediately upstream of the weirs, allowing sediment deposition and development of a stable, armored channel bed. Due to the presence of these depositional sections, the drop heights at Weirs #3, and #4 are all within WDFW regulations (0.8 feet or less). The drop height at Weir #2 was surveyed as being acceptable, but is marginal.

Weir #5 is approximately 340 feet downstream of the 16-inch pipeline crossing. A 130-foot-long pool has formed downstream of Weir #5. The drop height at this weir is approximately 1.4 feet, which is approximately 0.6 feet greater than the WDFW standard of 0.8 feet (Fisher, L., 2008). The channel gradient within the reach is much higher relative to the upstream and downstream reaches at approximately 1 to 5 percent with little to no sediment deposition within the reach. The channel may have been straightened during the installation of the pipeline to keep the channel oriented parallel to the pipeline rather than bending towards or across the pipeline. The relatively straight and narrow channel configuration generates higher-energy flows because the flow energy is not dissipated over a wider cross-sectional area, meander bends, or obstructions. The channel is confined by glacial till and man-placed bank armoring. Granular soil overlying the glacial till consists of gravel and sand with silt and occasional cobbles. The coarser material is relatively resistant to erosion. We observed near vertical exposures in the stream banks. The left bank is armored primarily downstream of Weir #5 for a distance of about 90 feet with gabion baskets, which create a 6-foot-high near-vertical wall along the stream channel. The armoring helps to protect the 16-inch pipeline from stream migration. Some deterioration of the gabion baskets, loss of rock from the baskets, and undermining of the baskets is occurring along the left bank. The relatively straight channel configuration, higher peak flows from upstream urbanization without stormwater controls, in conjunction with armoring of the banks, has promoted channel incision and slight increases in erosion of the right bank within this reach.

The concrete grade control weirs that are dispersed throughout middle reaches of Kelsey Creek (including the project area) may affect salmonid spawning distribution downstream by partially blocking upstream access. Riparian vegetation and structure is present, however it is characterized by small willows (*Salix spp.*) and non-native noxious species such as Himalayan blackberry and Japanese knotweed. Large woody debris is not present in the subject reach and there is little opportunity for recruitment because of the bank armoring and immature woody vegetation along the banks of the subject reach. Pool habitat quality is good because of the consistent overhanging vegetation and deep pool depths.

WDFW identifies the subject reach of Kelsey Creek as documented habitat for Chinook (*Oncorhynchus tshawytscha*), coho (*O. kisutch*), sockeye (*O. nerka*) salmon, and cutthroat trout (*O. clarkii clarkii*) (WDFW, 2008 and 2009). During the April 2009 site reconnaissance, GeoEngineers staff observed salmonid fry within the subject reach but we were unable to determine the species.

According to LUC 20.25H.075 (B) (2) Kelsey Creek is regulated as a Type F Water. Type F waters include all waters that are not shorelines of the state and contain fish or fish habitat. On undeveloped sites (sites that do not contain a primary structure), a 100-foot-wide buffer is established from the top of the bank of Type F waters, in accordance with LUC 20.25H.075 (C)(1)(a)(i).

3.3 GEOLOGIC HAZARDS

According to LUC 20.25H.120.A, Geologic hazards are defined as follows:

1. Landslide Hazards. Areas of slopes of 15 percent or more with more than 10 feet of rise, which also display any of the following characteristics:
    - **a.** Areas of historic failures, including those areas designated as Quaternary slumps, earthflows, mudflows or landslides.
    - **b.** Areas that have shown movement during the Holocene Epoch (past 13,500 years) or that are underlain by landslide deposits.
    - **c.** Slopes that are parallel or subparallel to planes of weakness in subsurface materials.
    - **d.** Slopes exhibiting geomorphologic features indicative of past failures, such as hummocky ground and back-rotated benches on slopes.
    - **e.** Areas with seeps indicating a shallow groundwater table on or adjacent to the slope face.
    - **f.** Areas of potential instability because of rapid stream incision, stream bank erosion, and undercutting by wave action.
2. Steep Slopes. Slopes of 40 percent or more that have a rise of at least 10 feet and exceed 1,000 square feet in area.

Inclinations at the site predominantly range from 0 to 15 percent, with short slope segments inclined at 15 to 40 percent, with near-vertical banks present along portions of the stream channel. Slopes inclined greater than 40 percent are located to the north of Kelsey Creek adjacent to the 16-inch pipeline crossing, on the north side of Kelsey Creek and just west of the 20-inch pipeline, along the stream bank about 60 to 90 feet downstream of Weir #5.

One area along the right bank of Kelsey Creek at the 16-inch product pipeline crossing consists of slopes inclined at gradients of greater that 40 percent, with portions of the slope inclined at gradients close to 100 percent. The slope is vegetated predominantly with Himalayan blackberry shrubs. Per LUC 20.25H.120.A (2006), this area meets the definition of a steep slope hazard. LUC 20.25H.120 (B)(1)(b) requires a 50-foot buffer from the top of this slope and LUC 20.25H.120 (C)(2)(b) requires a structure setback of 75 feet from the toe without further evaluation. The 16-inch pipeline was installed in the 1960s or early 1970s across this slope. The cut to install the pipeline may have resulted in slightly steeper slopes as standard construction practices at that time did not usually result in contouring the ground back to original shape. The lower portion of this slope is armored with rip rap that was placed at the time the weirs were installed in 1995. Because the toe of the slope, which is located along the right bank of Kelsey Creek, has been armored with riprap, there is a low potential for bank failure or lateral channel migration of the creek in this area. We observed no indications that this slope has moved. We observed no geomorphic evidence of past movement, failure or erosion. We did not observe any seeps or saturated

areas on the slope that would indicate slope instability associated with groundwater discharge. Based on the evaluation of the slope by GeoEngineers (2009b), the distance from the excavation planned on the south side of Kelsey Creek is sufficient.

A potential landslide hazard exists within the utility corridor and to the west of the temporary access road. The slope is inclined at gradients of 15 to about 30 percent. Wetland A is located at the base of this slope. Wetland conditions are driven by groundwater discharge from this slope. Based on these characteristics, this area meets the City of Bellevue definition (LUC 20.25H.120.A) of a landslide hazard area. The slope rises at an approximate 50 percent grade from a deep pool on the outside bend of the creek. A 32 inch western red cedar tree is located at the top of the stream bank where the downslope edge of the wetland boundary is mapped. This tree is leaning towards the creek which would indicate bank failure at the toe of the slope due to lateral stream channel migration. However, because of the size of this tree and typical growth rates, the pistol-butted trunk of the tree indicates that the movement of the tree has been slow and ongoing. There is no indication of movement up slope of the tree which would suggest that the tree has shifted catastrophically over its estimated 50 to 75-year life span. We observed no other indication of ground movement. The bank where the tree is located is on the outside of a bend, and the bank is being undercut. However, the bank consists of till overlain by a relatively compact gravel and sand with cobbles. LUC 20.25H.120 (B)(1)(a) requires a 50-foot buffer from the top of the landslide hazard and a 75-foot buffer at the toe. The toe of the landslide area and a steep slope located downstream are lateral to construction activities, with the exception of placement of the stream bypass pipe. The bypass pipe will be placed by hand, reducing the potential for impacts.

Steep slope hazard areas are located along the left stream bank upstream and downstream of the mapped landslide hazard area. The proposed work area is located within the steep slope hazard area upstream of the mapped landslide area (see Figure 2 and Figure 3). This area could also be classified as a landslide hazard, but is protected by gabions installed along top and face of the stream bank to protect the pipeline from erosion of the stream bank. The gabion system is present along the left stream bank and extends about 12 feet (or more in places) back from the top of bank where most of the equipment will be operated. We did not observe any seeps or saturated areas on the slope that would indicate slope instability associated with groundwater discharge. The native glacial till found at this location is very resistant to failure and rapid stream bank erosion. A short segment of the gabion system will be partially removed and replaced with the rock drop structure and associated bank key. Olympic proposes to remove as short of a segment of the gabion system as possible to maintain protection of the pipeline. Where the gabion is removed and protection of the pipeline is needed, a buried rock wing wall will be constructed that extends downstream from the rock drop structure along the alignment of the removed gabion system. The extent of the gabion system to be removed will depend on conditions encountered in the field, but will extend no more than about 25 feet downstream from the rock drop structure (just upstream of cross section C-C'). It is our opinion that the planned construction activities along the top of the steep slope hazard area will not impact stability, provided appropriate construction measures are implemented during construction. This area is a regulated steep slope as defined by LUC 20.25H.0120 (A)(2). LUC 20.25H.120 (B)(1)(b) requires a buffer of 50 feet to be measured from the top of the steep slope hazard area and LUC 20.25H.120 (C)(2)(b) requires a 75-foot setback of structures from the toe.

The steep slope downstream of the landslide hazard area consists of slopes inclined at an overall gradient of about 50 percent from the toe to the top of bank, with gradients of about 40 percent upslope. The bypass pipe for the project will be placed across this area. However, we do not anticipate that the proposed project will impact this regulated steep slope hazard area or its associated buffer.

A detailed analysis of Geologic Hazards at the site can be found in the Geotechnical Design Report (GeoEngineers, 2009b).

3.4 Habitats Associated with Species of Local Importance

GeoEngineers determined the presence of habitat at the site that may have a primary association with the Species of Local Importance listed in LUC 20.25H.150 (A). Those species include:

- **Pileated woodpecker** – Habitat includes various forest structures; broadleaved, coniferous, mature and old-growth, or mixed canopy forest. Habitat areas include suburbs where there are large trees to roost and nest in. Typical roost trees are western hemlock and western red cedar (Birdweb, 2009).
- **Vaux's swift** – Commonly found foraging in woodland habitat near lakes and rivers. Vaux's swift usually nest and roost in old-growth or snag habitat, but are also are found in habitats with suitable nesting trees such as coniferous or mixed forests where snag cavities with vertical entrance are present. They have been know to establish communal roosts in large man-made structures, such as, non-operating industrial smoke stacks and old school chimneys (Fisher, C., 1996).
- **Merlin** – Merlin habitat varies from forest edges to farmland. Merlins are found in urban areas during winter and migration. Nests are primarily constructed in conifers between 18 and 36 feet high or in old crows' nests (Bell and Kennedy, 2006).
- **Great blue heron** – Great blue herons are found in a variety of habitats including marshes, swamps, river and lake edges, tidal flats, and riparian areas (Stokes, 1996).
- **Red-tailed hawk** – Habitat is extremely varied ranging from open fields, urban areas and roadsides. Any habitat with open areas combined with patches of trees or other elevated perches can potentially be red-tailed hawk habitat. Nests are built in tall trees, often the tallest tree available (Fisher, C., 1996).

3.5 Areas of Special Flood Hazards

The FEMA Flood Insurance Rate Map (FEMA, 1995), that includes the site indicates that portions of the project are within the area subject to inundation during a 100-year flood event. The City has determined the 100-year floodplain for the subject reach and has provided GeoEngineers this recent digital data in Geographic Information System (GIS) format. We have presented the extents of the 100-year floodplain, determined by the City, on Figure 5. In general, the 100-year floodplain through the project reach is confined within the banks of Kelsey Creek.

4.0 ANTICIPATED PROJECT-RELATED IMPACTS

This project has been designed to avoid and minimize impacts to environmentally sensitive areas to the maximum extent feasible while installing the necessary pipeline protection measures. However, temporary impacts to some of these areas are unavoidable.

4.1 Wetland Impacts

The project will result in approximately 1,618 square feet of short-term temporary impacts to vegetation within Wetland A. These wetland vegetation impacts will be isolated to the work area and temporary soil stock pile area located primarily within the maintained Olympic pipeline corridor on the left bank of Kelsey Creek, downstream of Weir #5 (Figure 3). This area is dominated by reed canarygrass which will not be removed as an erosion and sediment control measure. Because there is no excavation or permanent fill occurring within the wetland we anticipate that temporary impacts will be limited to the existing vegetation within the emergent and shrub wetland habitat. The temporarily impacted wetland areas will be revegetated with native species to restore and enhance their pre-project habitat conditions.

Soil structure within the wetland will not be affected other than some superficial compaction as a result of the excavator operating from timber mats in the emergent wetland area. This impact is expected to be temporary because of the mitigating soil decompaction measures discussed in Section 5.3.1.

The topography in temporarily impacted wetland area will be restored to the pre-construction contours and elevations and no changes to wetland hydrology and /or surface water flow paths are anticipated.

4.2 IMPACTS TO KELSEY CREEK

The project will result in approximately 1,828 square feet of temporary construction impacts to the Kelsey Creek channel below the OHWM. At the location of the 20-inch pipeline crossing, approximately 817 square feet of the stream channel bed and the left bank will be excavated to install rip rap to provide additional pipeline protection. At the location of the 16-inch pipeline crossing, approximately 261 square feet of the stream channel bed and the left bank will be excavated to install an additional 8-foot long by 4-inch thick concrete river weight over the pipeline. We do not anticipate that any additional fill will be required at the 16-inch pipeline crossing. The excavated stream bed material will be sidecast in the channel next to the excavation and this material will be returned to the channel bed after completion of the pipeline protection measures. This will effectively restore the existing channel material at the pipeline crossings. The stream channel at these locations will be restored to their pre-project cross sectional contours and no change in flow or hydraulics are anticipated at these locations.

Olympic is proposing to cut notches in Weir #2 and Weir #5 in addition to installing a rock drop structure (rock weir) about 60 feet downstream of Weir #5 to enhance fish passage. HEC–RAS modeling indicates that notching of the weirs will result in a lowering of the surface water elevations behind (upstream) Weirs #2 and #5 by 0.05 feet 0.29 feet, respectively (GeoEngineers, 2009c). We consider this lowering of the surface water elevation to be negligible and will have no significant effect on stream dynamics or in-stream habitat.

Installation of the rock drop structure will result in a negligible loss of slow water pool habitat and a change in the cross sectional area of the stream at the location of the rock drop structure. The rock drop structure has been designed to raise the surface water elevation (backwater) and to deepen the pool downstream of Weir #5. These minor impacts to the aquatic habitat near the rock drop structure will be self mitigating because they will result in a reduction in hydraulic drop at Weir #5. Reducing the hydraulic drop at this location will enhance fish passage through the project reach. Additionally, the rock drop structure will provide greater diversity in habitat type and complexity by providing refugia within the interstitial spaces of the rocks and by breaking up the long glide downstream of Weir #5 into different gradients (WDFW, 2003).

The construction of the rock drop structure will require demolition of the gabion exposed in the bank of the stream and at the top of the bank to allow construction of the bank key. A join in the gabion baskets is present at the upstream edge of the bank key. The extent of gabion baskets to be removed will be established based on conditions in the field, but will extend downstream no more than about 30 feet from the upstream join. A buried rock wing wall with a heavy coir-reinforced soil facing will be installed along the footprint of the gabion system that is removed. The soft-bioengineered soil lifts, about 12 inches thick, will be installed along the stream bank commencing near the toe of the old gabion system. The soil lifts will be planted with native riparian species. The log installed in the rock drop structure along the left bank will be angled up to provide some protection for the soil lifts closest to the rock drop structure. By removing the gabion armoring and installing the soil lifts with native vegetation and the log, Olympic will improve stream habitat and vegetative cover downstream of the rock drop structure while maintaining the pool habitat that exists within this reach.

Modeling indicates that the proposed rock drop weir structure will locally increase flood elevations by slightly more than 1 foot, from near the proposed rock drop structure upstream to below Weir #5. The modeled horizontal extent will be confined by the existing stream banks, and will not impact the adjacent residence on the property where the work will be completed. The change is expected because of the installation of a structure with a crest about 2.5 feet above the existing stream bottom. Elsewhere, modeling indicates the proposed changes to weirs and the addition of the new weir will result in increases that are less than 1 foot in elevation and locally result in lower 100-year flood elevations.

4.3 IMPACTS TO GEOLOGIC HAZARD AREAS

As a matter of practicality and safety, this project has been designed to avoid steep slopes and landslide hazards to the greatest extent feasible. However, temporary impacts to the areas are unavoidable. Approximately 1,352 square feet of Geologic Hazard Areas will be temporarily impacted as a result of the proposed project. Installation of the construction access road will result in 999 square feet of temporary impacts within the 50-foot buffer upgradient of the identified landslide hazard within the utility corridor (See Figure 5).

4.4 CRITICAL AREA BUFFER IMPACTS

The project is expected to result in 15,530 square feet of unavoidable temporary impacts to the overlapping buffer areas associated with Wetland A, Kelsey Creek and the landslide hazard located near Wetland A. Most of the impacts of the project within these critical area buffers will be limited to ground and vegetation disturbances. As a result of past and ongoing land use, these buffer areas have been disturbed and are characterized by non-native invasive shrubs and noxious weeds, such as Himalayan blackberry and Japanese knotweed. Olympic has purposely sited their access road and staging area in these degraded habitats with the intention of removing the problematic vegetation species and replanting with native species at the completion of the project. Impacts to the critical area buffers as a result of the project will be temporary and will result in the establishment of an appropriate buffer habitat characterized by native vegetation species.

Temporary impacts to Critical Areas are summarized below in Table 1.

Table 1. Temporary Critical Area Impacts.

Impacted Habitat	Area of Temporary Impact
Category IV Wetland	1,618 ft^2
Kelsey Creek Channel and Banks	1,828 ft^2
Geologic Hazard Areas	1,352 ft^2
Wetland, Stream and Geologic Hazard Area Buffers	15,530 ft^2

5.0 IMPACT MINIMIZATION AND RESTORATION PLAN

To install the necessary pipeline protection measures and enhance fish passage through the project reach, impacts to Kelsey Creek, Wetland A and their overlapping buffers are unavoidable. Olympic intends to fully restore the areas that are temporarily disturbed by the project and enhance them beyond their pre-construction conditions. Olympic will restore approximately 1,618 square feet of Wetland A, approximately 1,828 square feet within the bed and banks of Kelsey Creek and approximately 15,530 square feet of critical area buffers at the site. Disturbed portions of the site outside of the

regulated critical areas will be stabilized at the completion of the project, in accordance with the Land Use Permit issued by the City.

5.1 Restoration Goals and Objectives

The goals and objectives of this on-site and in-kind restoration plan are outlined in this section and are discussed in further detail below. These goals and objectives include:

- Avoid impacts to the well-developed forest community east and west of the site by limiting construction activities to the maintained utility corridor.
- Avoid impacts to Wetland A by adjusting the temporary construction access to circumvent the wetland. The temporary construction access has been sited through upland areas infested with invasive vegetation as opposed to traversing the relatively undisturbed wetland.
- Minimize impacts to Wetland A and the banks of Kelsey Creek by reducing the work area to the minimum area necessary to complete the project.
- Restore the temporarily disturbed vegetation structure and function of the emergent and shrub habitats of Wetland A by revegetating with native plants.
- Avoid construction impacts to the stream channel by preventing excavators and other heavy equipment from entering the stream channel.
- Restore the streambank downstream of the new rock-drop structure by replacing the degraded rip rap and gabions with soft bio-engineered soil lifts and large woody debris. The soil lifts will be replanted with native species with the goal of enhancing instream and riparian habitat.
- Improve fish passage through the project reach by adjusting the hydraulic jump of Weir #5 and Weir #2. Notches will be cut into the existing concrete weirs and a rock drop structure will be placed in the channel downstream of Weir #5.
- Enhance the stream, wetland and landslide hazard buffers by removing invasive species and planting native vegetation in the buffer areas impacted by construction site.

- These restoration goals and objectives of this restoration plan were developed to restore disturbed areas at the project site and are consistent with the restoration goals for temporary impacts outlined in Ecology (2006).

5.2 Impact Avoidance and Minimization

The City requires that Olympic demonstrate that all reasonable efforts have been examined to avoid and minimize impacts to critical areas as a result of the project. Direct impacts to the critical areas identified in this report will be avoided to the maximum extent practicable. However, temporary impacts to Kelsey Creek and Wetland A are unavoidable. Olympic and its contractors have incorporated a number of low impact designs and construction techniques that will minimize the magnitude, duration and areal extent of impacts to the site and the surrounding environment. Other permit conditions attached to the City of Bellevue Land Use Permit, the WDFW Hydraulic Project Approval, the Ecology Section 401 Water Quality Certification, and the Corps of Engineers Section 404 permit are expected to include project requirements that will directly or indirectly control temporary and permanent impacts to Kelsey Creek, Wetland A and their associated buffers.

5.2.1 Project Layout

The project layout, shown in Figure 3, has been designed to avoid wetland impacts by utilizing an existing access route around Wetland A that was used for the work in 1995. The contractor will clear and

utilize a route around Wetland A along the eastern edge of the utility easement and south of Kelsey Creek that is vegetated with invasive species. The vegetation consists of Japanese knotweed and Himalayan blackberry. The primary temporary construction staging area will be constructed at the north end of 136th Avenue NE, about 900 feet south of the creek. An existing gravel-surfaced parking area will be altered by removing border timbers to level the area. Geotextile fabric such as Mirafi 150N will be placed across the surface and covered with crushed rock, quarry spalls or hog fuel. A quarry spall construction entrance will extend from the paved road surface for a distance of at least 100 feet along the access route to the work area. The remainder of the access will be accomplished by driving overland to the extent possible. The route will be brushed out as needed. It is possible that relatively small cut and fill slopes (18 inches high or less) will be required for a distance of about 440 feet along the southern portion of the access route where it crosses a slight side slope of about 5 to 10 percent. This segment of access includes a slight concave slope that could require up to about 3 feet of fill. Access and work areas will be brushed out by hand or by self-propelled mowing equipment mounted on skid steers or tractors. The primary temporary staging area and the temporary access route will be utilized to facilitate movement of equipment and materials to the work areas next to the creek and within Wetland A. Upon completion of the project, these areas will be restored according to the Restoration Plan (see Figures 7 and 8).

5.2.2 Temporary Erosion and Sediment Control (TESC)

In order to minimize and avoid impacts, the work will be completed over a relatively short period in the summer and early fall when precipitation is typically low. Anticipated work schedule is between August 15th and September 30th. None of the work activities are expected to cause any increase in water turbidity or sedimentation to Kelsey Creek or sensitive wetland areas beyond the construction site. Olympic has developed a Turbidity Monitoring Plan for Kelsey Creek at the request of the City. In accordance with the TESC plan (GeoEngineers, 2009d) that has been prepared for the project, the contractor will install temporary erosion and sediment control (TESC) measures prior to any earth disturbing work or clearing of vegetation. TESC measures will be inspected, maintained and augmented if necessary to prevent impacts to the stream and wetland. After completion of the project, TESC controls will be removed from the area for offsite disposal. Temporary access routes will be re-graded, and revegetated according to the Restoration Plan (Figures 7 and 8). Other impact avoidance and minimization measures include:

- Silt fence will be installed to prevent migration of sediment off site or into the stream channel. Orange construction fencing will also serve to establish the limits of construction activities. The boundaries will be located to minimize direct and indirect impacts to vegetation to the extent practicable. The contractor will not to operate beyond the identified construction limits.
- Site preparation, grading, and project work will be completed during drier summer weather to the extent practicable. Precipitation and runoff will be monitored during construction so that any exposed material or equipment can be protected or, if necessary, work can be suspended.
- Native vegetation at the site will be maintained to the maximum extent feasible.
- Any denuded areas will not remain exposed for more than seven days during the construction period. Denuded areas will be covered with composted mulch or erosion control fabrics as appropriate to reduce rain and runoff impacts.
- If excavated soils are very wet, a filter/straw containment area for the soil stockpile will be prepared.
- Straw wattles will be used, if necessary, to prevent sediment from entering the wetland from the adjacent disturbed areas. Water generated during excavation activities will be directed through filter socks or sediment traps prior to release in upland vegetated areas.
- Timber driving mats will be used in the wetland to reduce impacts to the soils and vegetation.

- Geotextile covered with hog fuel will be used for stockpiling of materials in the Weir #5/rock drop structure work area to identify the pre-construction elevation in Wetland A and reduce impacts to the soil and vegetation that will be covered by the temporary soil stockpile.
- Daily inspections of the erosion control measures will be conducted throughout the construction period. This will ensure the effectiveness of the measures and determine the need for maintenance, repairs, or additional measures.
- Construction equipment will be refueled using a refueling truck and fueling will not be completed within 100 feet of aquatic environments, with the exception of the bypass pump system. If a separate fuel tank cannot be used, all refueling will occur within a secondary containment area suitably sized to contain the volume in the pump/generator and the refueling vehicle. All fuels and hazardous liquids will be stored in secondary containment to avoid spills and leaks. The contractor will have the necessary resources on-site, including spill kits, to address both major and minor spills at the site.

5.2.3 Stream Bypass

The Integrated Stream Bank Protection Guidelines (WDFW, 2003)ISGP recommends that the method selected for dewatering an in-stream work area be capable of passing at least the one-year flow event. However, it is anticipated that the in-stream work will be less than two weeks in duration, and will be completed during in late August or September, typically the driest time of the year. Therefore, we used estimated flows used for the water bypass system design for the weir installation project in 1995. The estimated flows were approximately 4 cubic feet per second (cfs) in September 1994 and 7.5 cfs in April 1995. The one year flow is estimated to be on the order of 150 cfs. The selected means of bypassing water will consist of pumping the water from upstream of the work area to a point downstream of the work area. The bypass will require installation of a temporary diversion dam (cofferdam) upstream of the work area and discharging the water to a suitable location downstream. Fish screens would be established upstream of the diversion structure and downstream of the discharge point.

The bypass will require a pump or pumps with a recommended pumping capacity of about approximately 4 to 7.5 cfs (about 1800 to 3400 gallons per minute). One 4-inch pump and one 6-inch pump were used in 1995. The outlet line will have to be routed across the access route through a culvert covered with fill to protect the culverts. The line then can be routed along the eastern boundary of the work area, then downstream to a point where the discharge will not flow back into the work area. It is anticipated that the pumps will be operated only during work hours, with the cofferdam system removed at the end of each work day, provided the upstream and downstream fish barriers are maintained. Otherwise, fish removal will have to occur each day.

Alternatively, the pumps will need to be operated 24-hours a day, seven days a week during construction. The use of a full-time pump would require observation at all times of the day and night, and require storage of a significant amount of fuel in close proximity to the stream. It is possible that a noise variance will be required. To reduce time during the day for dewatering of work areas, the contractor may have to operatee the pumps overnight for at least two consecutive days.

The diversion pump(s) should not be operated at full capacity at diversion start up. The pump should not remove more than one-half the stream flow at the start of dewatering the work area, to allow for the capture and relocation of fish from within the work area. This should also help maintain water quality during start up of the bypass. Fish screens should be located upstream of the pump intake. A fish screen should also be located downstream of the diversion system until the work area has been cleared of fish.

Discharge from the pumped bypass should be returned to the stream at a point where water will not flow back into the work area. It will be necessary to install an energy dissipater at the outfall to prevent erosion and turbidity. This can most effectively be accomplished by installing a Tee-shaped diffuser constructed using a 4-foot-long, 36-inch diameter section of pipe capped at the ends. Holes 3-inches in diameter should be drilled into the downstream face. It will be necessary to secure the outlet pipe and diffuser Tee for the bypass using staking consisting of steel fence posts or #8 rebar perhaps augmented with sand bags. Additional holes may be needed and can be assessed as the flows are gradually increased. If necessary, sand bags could be used to protect stream bottom and banks around the diffuser Tee.

It may be necessary to use a smaller pump to dewater the area downstream of Weir #2 and the area in the vicinity of the proposed rock drop structure. This water should be discharged to the same area as the full stream bypass. During start up, it may necessary to use a filter bag to reduce potential turbidity. The work area in the vicinity of the new weir is within a long pool that would have to be dewatered to work in the dry. Therefore, to reduce the volume of water to be pumped, it may be desirable to install a cofferdam downstream of the work area.

During construction, it is anticipated that the stormwater outfall just below the diversion structure will be dry. However, the contractor should be prepared to collect and route flows from the storm drain around work areas. The contractor may be able to time work close to the outfall such that any flows are minimal or non-existent. Otherwise, piping may need to be temporarily installed to collect and route the water around the nearby excavation. Small pumps may be needed in the immediate area of work areas to help collect and route water downstream.

5.3 Approaches to Restoration

Restoration of disturbed areas will be conducted in accordance with the procedures discussed in the following sections and shown on Figures 7 and 8. A site-specific restoration approach and has been developed for each identified impacted habitat at the site.

5.3.1 Wetland Restoration

All temporarily impacted wetland areas will be restored to the pre-project topography and elevations and revegetated. Because of the impact minimization measures employed by Olympic, we do not anticipate a significant impact to the soil structure within Wetland A. Upon completion of the work within Wetland A, the contractor will remove the soil stockpile with the protective geosynthetic fabric and the timber driving mats. The compacted soils will be scarified with an excavator to decompact the soil.

Disturbed wetland areas will be re-planted with native wetland species appropriate to the habitat, and to accommodate the degree and duration of inundation that is expected. Recommended species are listed in Table 2. Figure 7 illustrates the proposed wetland plant communities: Palustrine Emergent Wetland (PEM) and Palustrine Scrub-Shrub Wetland (PSS). An estimated quantity of each species that will be needed and a typical layout for each plant community is included on Figure 8. The proposed wetland plant communities are comprised of, facultative (FAC) and facultative wetland (FACW) shrubs; and of facultative wetland and obligate (OBL) wetland emergent species. The disturbed shrub wetland areas will be immediately stabilized by applying 2 inches of composted mulch to the affected areas and will be with the species listed in the Shrub Wetland Plant Schedule on Figure 8. The emergent portions of Wetland A that will be temporarily impacted by construction will be reseeded with a custom wetland seed mix, as specified on Figure 8, prior to adding 2 inches of composted mulch.

Table 2. Wetland Planting Palette

Common Name	Scientific Name	Indicator Status	Habitat Community
Small-fruited bulrush	*Scirpus microcarpus*	OBL	PEM
Creeping spikerush	*Eleocharis palustris*	OBL	PEM
Soft rush	*Juncus effusus*	FACW+	PEM
Tufted hairgrass	*Deschampsia caespitosa*	FACW	PEM
Nootka rose	*Rosa nutkana*	FAC	PSS
Red-osier dogwood	*Cornus sericea*	FACW	PSS
Salmonberry	*Rubus spectabilis*	FAC+	PSS
Pacific ninebark	*Physocarpus capitatus*	FACW-	PSS
Hardhack	*Spirea douglasii*	FACW	PSS
Sitka Willow	*Salix sitchensis*	FACW	PSS

Species listed in Table 2 are suggestions only and can be modified based on availability, provided that any substitutions are appropriate to the community and degree of saturation. All deviations from the restoration plan and plant substitutions will be approved by a GeoEngineers wetlands biologist.

The temporary soil stockpile area is partly located within a shrub wetland habitat that is dominated by red-osier dogwood and Sitka willow. These two species have a high coppice potential; i.e. they have the ability to propagate from cuttings. It is recommended that impacted areas that contain these two species be harvested prior to impacts. Cutting from these species should be approximately ¾ inch in diameter and approximately 4 to 5 feet long. The leaves should be stripped and the cuttings should be immersed in water until they are installed during site restoration activities.

It is not anticipated that the plantings in the wetland will require supplemental irrigation given the prolonged duration of soil saturation at the site. However, supplemental irrigation may be required in revegetated areas outside of the wetland during the summer months (July through September) to promote plant survival.

5.3.2 Stream Channel Restoration and Fish Passage Enhancement

In order to restore the spawning and rearing habitat conditions that currently exist in the stream channel, impacts to the stream will be the minimum necessary to install the pipeline protection and fish passage enhancement measures. We do not anticipate heavy equipment, such as an excavator will need to operate below the top of the existing banks of Kelsey Creek. As a result we expect that disturbances to the stream channel will be limited to an 8-foot-wide area at the location of the 16- and 20-inch pipeline crossing, the channel in the vicinity of Weir #5, the area of channel around the proposed rock drop structure and in the area of the bioengineered soil lifts downstream of the rock drop structure.

Olympic is proposing to cut notches in Weir #2 and Weir #5 to enhance fish passage. Based on modeling results by GeoEngineers (2009c), a notch 0.25 feet deep and 2 feet wide centered at the low point of Weir # 2 will improve the drop height at this weir to a range acceptable by WDFW. For Weir #5, the notch will be 0.5 feet deep and 2 feet wide. Based on modeling by GeoEngineers (2009c), notching Weir #5 alone will not improve the drop adequately to meet fish passage criteria. Therefore, a rock drop structure (rock weir) is proposed about 60 feet downstream of Weir #5 to elevate the surface water elevation downstream of Weir #5, as shown in Table 3.

Table 3. Weir Crest Elevations and the Resulting Hydraulic Drop at each Weir.

	Existing			Proposed		
	Downstream Water Surface Elev.	Weir Crest	Drop	Downstream water Surface Elev.	Weir Crest	Drop
Weir	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
1	145.79	146.41	0.62	145.71	146.41	0.70
2	144.82	145.46	0.64	144.82	145.21	0.39
3	143.83	144.42	0.59	143.83	144.42	0.59
4	143.36	143.43	0.07	143.15	143.43	0.28
5	141.43	142.94	1.51	142.38	142.44	0.06
Rock Drop	NA	NA	NA	141.43	141.84	0.41

*Note: Surface water elevations reflect low flow conditions, or 4 cfs, as measured in the channel in 2005.

Notching will be accomplished using standard concrete cutting tools. Cutting the concrete will create dust that will need to be controlled and kept out of the stream channel. Notching will be accomplished while the stream is dewatered; however, it will likely be necessary to install temporary pumps to lower the water on the downstream side of each weir (and potentially the upstream side as well). The contractor will use suction as means to control dust and/or wet slurry from the hand operated concrete saw.

During the time that work is being accomplished to address fish passage concerns, sediment upstream of Weir #5 will be removed so that a grocery cart embedded in the stream bottom can be removed. The remainder of sediment and any armoring will be removed upstream and downstream of the weir to evaluate if scour has occurred beneath the concrete weir. If scour appears to have occurred, any voids will be backfilled with native glacial soils excavated for the construction of the rock drop structure. Gravel and rip rap will be placed over the rip rap. In addition, rip rap will be selectively placed along toe of existing gabion baskets downstream of Weir #5 and the rock drop structure in areas where the bottom of the gabions are corroded and not protected by rip rap placed in 1995.

The concept of the rock weir structure was considered based on suggestions made by Alex Uber at WDFW in a telephone conversation with Craig Erdman of GeoEngineers (Uber, 2009). The WDFW representative also suggested incorporating large woody debris in the design to provide habitat. The design of the rock drop structure has been developed based on concepts and guidance presented in the Integrated Streambank Protection Guidelines [ISPG] (WDFW, 2003) (see Figure 9). Additional stream habitat restoration guidance was obtained from the Stream Habitat Restoration Guidelines (Saldi-Caromile et al., 2004). The proposed rock drop structure consists of a V-shaped weir that points upstream and is constructed out of properly sized rock. A "V"-shaped structure creates greater channel diversity than a straight weir, in part by focusing flows towards the center of the "V" where a scour pool is expected to form. The weir also has the benefit of slowing the high flows through this segment of the stream. A conceptual plan and profile view of the weir, as presented in the ISPG (WDFW, 2003), is shown in Figure 4. Each arm of the "V" is angled at approximately 45 degrees from the bank in an upstream direction. The arms are constructed to slope very gently down from the banks to the crest at the apex of the "V." The length of the structure between upstream and downstream ends is typically less than 15 feet. In an upstream-downstream profile view, the height of the rock fill decreases in an upstream direction to match the existing stream bed elevation. The structure is keyed into the bank, typically to a point 1 foot or more above the 100-year flood elevation.

Woody debris consisting of two logs will be embedded to project from the downstream side of the rock drop structure to provide additional habitat structure for fish. All woody debris should consist of Douglas fir, western red cedar, or hemlock fir. The logs should be sound and have a minimum diameter of 18 inches, but typically range from about 18 to 24 inches. The logs should be at least 20 to 30 feet long, with at least two-thirds of the length buried within the rock drop structure. To install the logs it may be necessary to remove and replace some of the existing rip rap along the left bank just upstream of where the rock drop structure is keyed into the bank.

It may be necessary to place bed gravel over rip rap bank protection or in areas where stream bed material is removed and not reused. Based on prior recommendations by WDFW representatives for other projects, we anticipate that imported bed gravel shall consist of clean, rounded, uniformly-graded gravel with a size composition of:

15 percent	4.0 to 3.0 inches;
40 percent	3.0 to 1.5 inches;
45 percent	1.5 to 0.25 inches;
< 3 percent	Fines less than 0.25 inches.

In most areas, we expect that about an 8-inch-thick layer will be placed; however, we anticipate that a thickness of 18 inches over the toe of the rip rap placed along the bank at the 20-inch pipeline crossing will be required.

5.3.3 Streambank and Riparian Habitat Restoration

Currently, the streambanks within the project reach are vegetated, however, the riparian areas within and adjacent to the utility corridor are infested with invasive Japanese knotweed. Japanese knotweed will be mechanically removed from the site. To minimize the chance of inadvertently spreading Japanese knotweed throughout the site, the infested areas will be chemically treated to kill this particular species. Approximately two weeks prior to construction at the site, each knotweed stem, larger than 0.5 inches in diameter, will be injected with concentrated glyphosate formulation, registered for use near wetlands and streams, just above the second node with a J.K Injection Tool (http://jkinjectiontools.com). For canes less than 0.5 inches in diameter, an 8 percent glyphosate solution registered for use near wetlands and streams will be directly applied to the leaves with a backpack sprayer. The glyphosate will be applied by a licensed aquatic pesticide applicator and great care will be taken to ensure that the product does not migrate into Kelsey Creek either through drift or by overland flow. No chemical will be applied in Wetland A. Weather conditions must be monitored carefully to avoid applying a chemical to Kelsey Creek immediately before heavy rains. Soil conditions and site topography must also be carefully studied to determine the appropriate timing of a chemical application.

An excavator will scalp the root masses and stems of Japanese knotweed and this material will be removed from the site and disposed of at an appropriate facility. The scalped areas will immediately be covered with a composted mulch and will be revegetated at the completion of the project according to the Restoration Plan (Figures 7 and 8).

The existing rip rap armoring along the left bank of the stream immediately downstream of the rock drop structure will be removed and the bank will be rebuilt with bio-engineered soil lifts and revegetated with native plants listed in Table 2. The soil lifts will be approximately 12 inches thick and constructed with native material wrapped in bio-degradable coir. The soil lifts will be installed above the two logs

installed in the channel substrate below the rock drop structure. Details of the soil lift construction are illustrated on Figure 10.

5.3.4 Wetland Buffer and Stream Buffer Enhancement

The project will result in approximately 14,531 square feet of temporary impacts to the overlapping stream and wetland buffers at the site. Currently the buffers are infested with invasive and exotic species which reduces the functional capacities of these areas. Olympic will restore and enhance these critical area buffers with native planting to increase the functional capacities of the buffers. Buffer restoration and enhancement will include:

- Removing illegally dumped trash and debris found in the buffers;
- Removing invasive vegetation in the buffers; and
- Installing native shrubs as shown on Figures 7 and 8.

5.3.5 Access Route and Staging Area

As mentioned previously, the temporary access route and staging area have been sited in the previously disturbed utility corridor to avoid impacts to Wetland A and Kelsey Creek. At the completion of the project, any fill along the route will be removed and revegetated in accordance with the Restoration Plan and Details on Figures 7 and 8.

6.0 MAINTENANCE AND MONITORING

6.1 MAINTENANCE PLAN

Maintenance of the site will greatly improve the vegetation performance at the restoration areas. Maintenance will be determined based on recommendations in the monitoring reports (see Section 6.2.4 below).

Irrigation of the restored areas is not planned, but may be required as determined during monitoring. If lack of irrigation is limiting plant growth and survival within the first year after planting, a temporary irrigation system may be required or a regular watering schedule established. During the dry months, usually July through September, it may be necessary to provide supplemental irrigation to the site. Extremely warm weather may necessitate watering on a more frequent basis. However it is not expected that supplemental irrigation will be necessary in the wetland because of the prolonged naturally occurring flow from the groundwater seeps within the wetland.

Control of undesirable species will be maintained by physically removing these plants from the revegetated areas using hand tools. These species include, but are not limited to, Himalayan blackberry, and reed canarygrass. Japanese knotweed in the restoration area may require ongoing chemical treatment to eradicate it from the revegetated areas. Native volunteer species that already exist on and within the vicinity of the site, in addition to those already proposed for planting will not be removed from the site. Other possible maintenance responsibilities such as the removal of trash will be evaluated and performed on an as-needed basis.

6.2 MONITORING PLAN

To gauge the performance of the restored areas, vegetation monitoring will be conducted at the site. Performance of the restoration of the site will be determined based upon an established performance standard discussed in Section 6.3. LUC 20.25H220 (D) requires a three-year monitoring period for a plan involving only restoration. Most likely, conditions of the federal permit authorization for the project will

require a monitoring period of no less than 5 years, which is the standard utilized in this monitoring plan. Monitoring events will be conducted according to the schedule in Section 6.2.3.

6.2.1 As-Built Design Report

The as-built plan and report will be prepared by a wetlands biologist immediately after replanting of the restoration areas. The report will include the following information:

- Responsible parties (designer, construction contractors, planting contractor) and whether a qualified wetland scientist or other responsible party was on site during construction;
- Construction timeline (including completion date);
- Any alterations to the original plan;
- Any problems encountered during construction and what was done to correct them;
- Any follow-up actions needed, with a schedule and who is responsible for them; and
- An as-built plan drawing that illustrates the extents of the restored areas and the locations of vegetation monitoring stations (discussed below).

The as-built report will also identify the elevations of the crest of each weir drop to verify that the hydraulic drop at each weir, including the proposed rock drop structure is in compliance with WDFW's fish passage criteria of less than 0.8 feet at each weir. Hydraulic drop of each weir will be determined by surveying the as-built crest elevations of each weir and verifying that each was installed or modified to the design elevation, as specified in the Hydraulics Analysis Report (GeoEngineers, 2009c).

6.2.2 Monitoring Plan

Vegetation establishment within the restored areas will be monitored over a 5-year period following site planting. The first monitoring event will document that restoration actions were implemented as specified in this restoration plan. Following the first monitoring event, inspections will be conducted for the remainder of the 5-year period as scheduled in following section. Following the final monitoring event in 2014, the City, the US Army Corps of Engineers (the Corps) and WDFW staff will be notified of site conditions at the end of the monitoring period.

Monitoring efforts will be conducted at fixed locations and data collected will include observations regarding plant survival and growth, hydrologic conditions and wildlife occurrences. Results from each monitoring event will be compared to the performance standards identified in Section 6.3. Monitoring will be conducted as follows:

- One wetland monitoring station will be established in the wetland restoration area to monitor performance parameters. The wetland monitoring station will consist of a monitoring area to be determined in the as-built report. The monitoring station will be located so that it includes only wetland area and excludes the portion of the wetland that is annually mowed by Olympic.
- A second monitoring station will be located in the overlapping stream and wetland buffer restoration area to monitor restoration performance in the upland buffers. Similar to the wetland monitoring station, the buffer monitoring station will consist of a monitoring area to be determined in the as-built report and will be located so that it excludes the portion of the wetland that is annually mowed by Olympic.
- Monitoring will be accomplished by determining the survival rate of the plantings within the monitoring stations. Counts of both dead and live plants will be conducted for each species. The general condition of each plant, such as observations of new growth and signs of stress or

disease, will also be noted. If plant survival falls below the threshold performance standards (Section 6.3) at any time during the monitoring period, additional plantings will be recommended to Olympic to be installed within the restoration area.

- Estimation of percent plant cover by species within the monitoring stations will be recorded. General observations regarding the proportion of cover as a result of natural recruitment of each species, including both desirable and invasive species, will be noted. If invasive species coverage exceeds the performance standard (Section 6.3) at any time during the monitoring period, control measures will be undertaken within the restoration area.
- Hydrologic factors including depth to ground water, soil saturation, and/or inundation will be measured at the wetland monitoring station.
- Wildlife recordings are to be made as general notes by the monitoring biologist during the monitoring events. Observations may include sighting of individual species, nests, burrows, droppings or other indicators. The results will be recorded and included in the monitoring report.
- Maintenance requirements such as trash removal and vandalism repair will also be noted. These observations will be included in the monitoring report.
- Photographs will be taken during each monitoring event to document the progression of the site over the monitoring period. Photographs will be taken in appropriate locations that show vegetation development through the 5-year monitoring period.
- At the completion of the project, the crest elevations of Weir #3, Weir #5 and the rock drop structure will be surveyed to ensure that hydraulic drop of these structures are within the design parameters provided by WDFW. The hydraulic drop of these structures will be monitored during each site visit.

6.2.3 Monitoring Schedule

Because of the extent of aggressive and noxious vegetation species at the site and surrounding areas; and the presence of documented habitat of a federally listed threatened species, the revegetation of the site will be monitored semi-annually. This increased level of monitoring will allow Olympic to rapidly identify a potential infestation and to expeditiously address the problem so that it does not compromise restoration goals. Monitoring will be conducted in the month of May of each year of the monitoring period. The informal results of this monitoring event will be reported to Olympic immediately following the May monitoring event. Monitoring will be conducted again near the end of the growing season of each year of the 5-year monitoring period.

6.2.4 Monitoring Reports

A monitoring report that presents the results of the spring and autumn monitoring events will be submitted annually to the City, the Corps and to WDFW. The monitoring reports will summarize the condition of the restoration site with respect to the performance standards identified below.

Monitoring reports will contain the following elements:

- Project information (project name and location, name and address of responsible party, any applicable project permit numbers, date project was constructed);
- Restoration site information (location of the restoration site, size and type(s) of habitats included in the restoration plan, date restoration site construction was completed);
- A description of monitoring requirements (name and address of party conducting the monitoring, map of the restoration site including locations of monitoring stations, dates of previous monitoring events, date of the current or most recent monitoring event);

- A brief summary of previous monitoring results, maintenance performed and contingency actions undertaken at the restoration site, including a description of any significant events that occurred on the site that may affect ultimate restoration success;
- A list of performance standards;
- Data from the current monitoring event;
- Discussion of wildlife utilization of the site, vegetation establishment, hydric soil development, observations of hydrology, wildlife utilization and existing or potential problem areas;
- A description of whether performance standards were met based on analysis of data collected during the current monitoring event; and
- Photographs of the site taken from each monitoring station during the most recent monitoring event.

6.3 PERFORMANCE STANDARDS

The success of the restoration will be judged against a performance standard defined in Section 6.2.2 to evaluate post-installation conditions at the site. The performance standard will be evaluated during all monitoring events. Failure to meet the performance standard at any point will trigger immediate corrective action. The performance standards for the restoration site is as follows:

- There shall be a minimum of 80 percent survival of all planted materials within the monitoring station throughout the monitoring period. Survival of the plantings at the site will be determined by counting and documenting the numbers of dead versus live plants within the monitoring station. Native volunteer species may count as an appropriate substitute for lost planted species within the appropriate stratum.
- Invasive species will not represent more than 15 percent cover within the monitoring stations in any of the monitoring events.

6.4 CONTINGENCY PLAN

As noted above, corrective actions taken to address failures to meet performance standards will be documented in monitoring reports submitted for review and approval by the City, the Corps and WDFW. Failures may include a higher than 20 percent plant mortality rate due to human activity, wildlife predation, or disease within the restoration area. Immediate corrective actions, such as replanting with different species or undertaking more aggressive invasive species removal, will likely remedy these failures without jeopardizing the overall success of the restoration project. An adaptive management strategy allows this contingency plan flexibility in response to unanticipated site conditions that negatively affect restoration goals. The course of action to be taken in the event of sub-standard performance will be based on the goals and objectives for the restoration project and the evolving physical characteristics of the restoration site.

7.0 PERFORMANCE AND MAINTENANCE SECURITIES

Pursuant to LUC 20.25H.260 and 20.40.490 (D) the project activity may require an assurance device or other security in a form and amount deemed acceptable by the City to ensure that the applicant performs all permit conditions, including the restoration plan. The City will review the estimate and , if acceptable, will establish the financial guarantee at 150 percent of the estimated total cost of installation plus 20 percent of the estimated total cost of maintenance and monitoring for 5 years, as required by LUC 20.25H.220 (D).

Table 4 presents estimated total costs of implementing the restoration plan including estimates of plant cost, delivery and installation, monitoring and maintenance, and contingency measures. These estimated costs are based upon supplier and contractor provided information at the time this report was prepared. Labor costs have been derived from experience in the field with projects of a similar nature. This estimate of probable costs may change depending on market conditions at the time of implementation and is not a commitment for GeoEngineers to perform the work.

Table 4. Estimated Costs to Implement Restoration Plan

Restoration Component	Cost
Total Estimated Critical Area Restoration Installation Cost	Approximately $80,000
Monitoring and Maintenance of the Restoration Area (5 years)	Approximately $12,000
Estimated Financial Guarantee Required by the City	Approximately $122,400

8.0 CONCLUSIONS

GeoEngineers has identified numerous critical areas at the site that are regulated by the City under LUC 20.25H. Those areas include one wetland (Wetland A), one stream (Kelsey Creek), areas subject to a 100-year flood event and three geologic hazard areas. These regulated critical areas have associated buffers which overlap each other and cover much of the project area. The project will temporarily impact approximately 1,618 square feet of the Category IV wetland, approximately 1,352 square feet of Geologic Hazard Areas and approximately 1,828 square feet of the bed and banks of Kelsey Creek below OHWM. A restoration plan has been presented to restore the critical areas and their buffers that are temporarily disturbed by the project. Restoration of the areas disturbed by the project will be monitored and maintained for five years to ensure restoration success.

9.0 LIMITATIONS

This report has been prepared for the exclusive use of the Olympic Pipe Line Company, their authorized agents and regulatory agencies following the described methods and information available at the time of the work. Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices in the field for critical area reports, habitat restoration plans, stream and river habitat enhancement, stabilization and restoration design engineering in this area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

No other party may rely on the product of our services unless we agree in advance to such reliance in writing. The information contained herein should not be applied for any purpose or project except the one originally contemplated.

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Any electronic form, facsimile or hard copy of the original document (email, text, table, and/or figure), if provided, and any attachments are only a copy of the original document. The original document is stored by GeoEngineers, Inc. and will serve as the official document of record.

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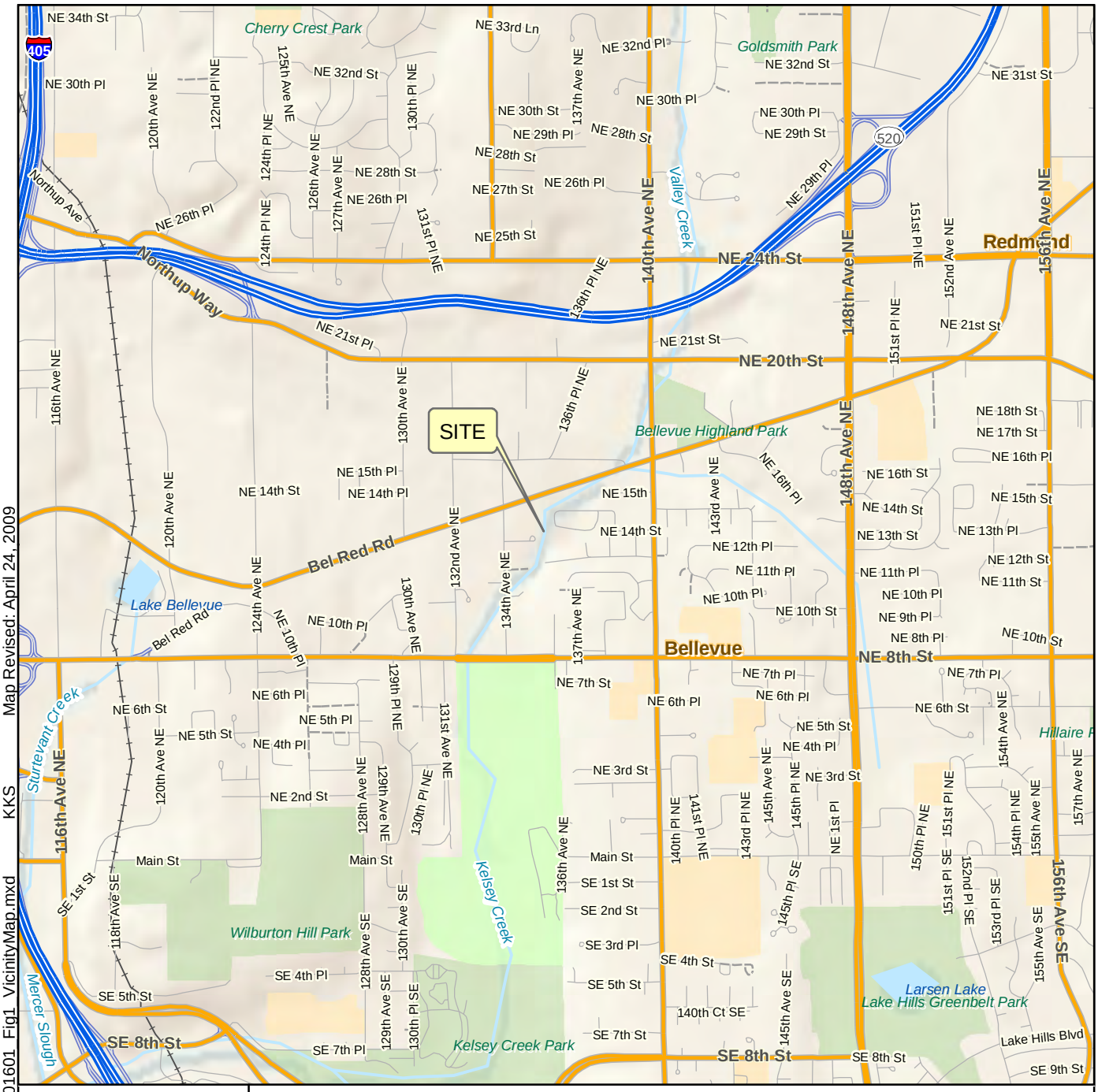

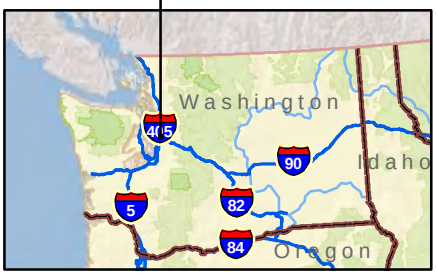

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Notes:
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Data Sources: ESRI Data & Maps, Street Maps 2005

Transverse Mercator, Zone 10 N North, North American Datum 1983
North arrow oriented to grid north

Vicinity Map

Olympic Pipe Line Company
Kelsey Creek Pipeline Protection Project
Bellevue, Washington

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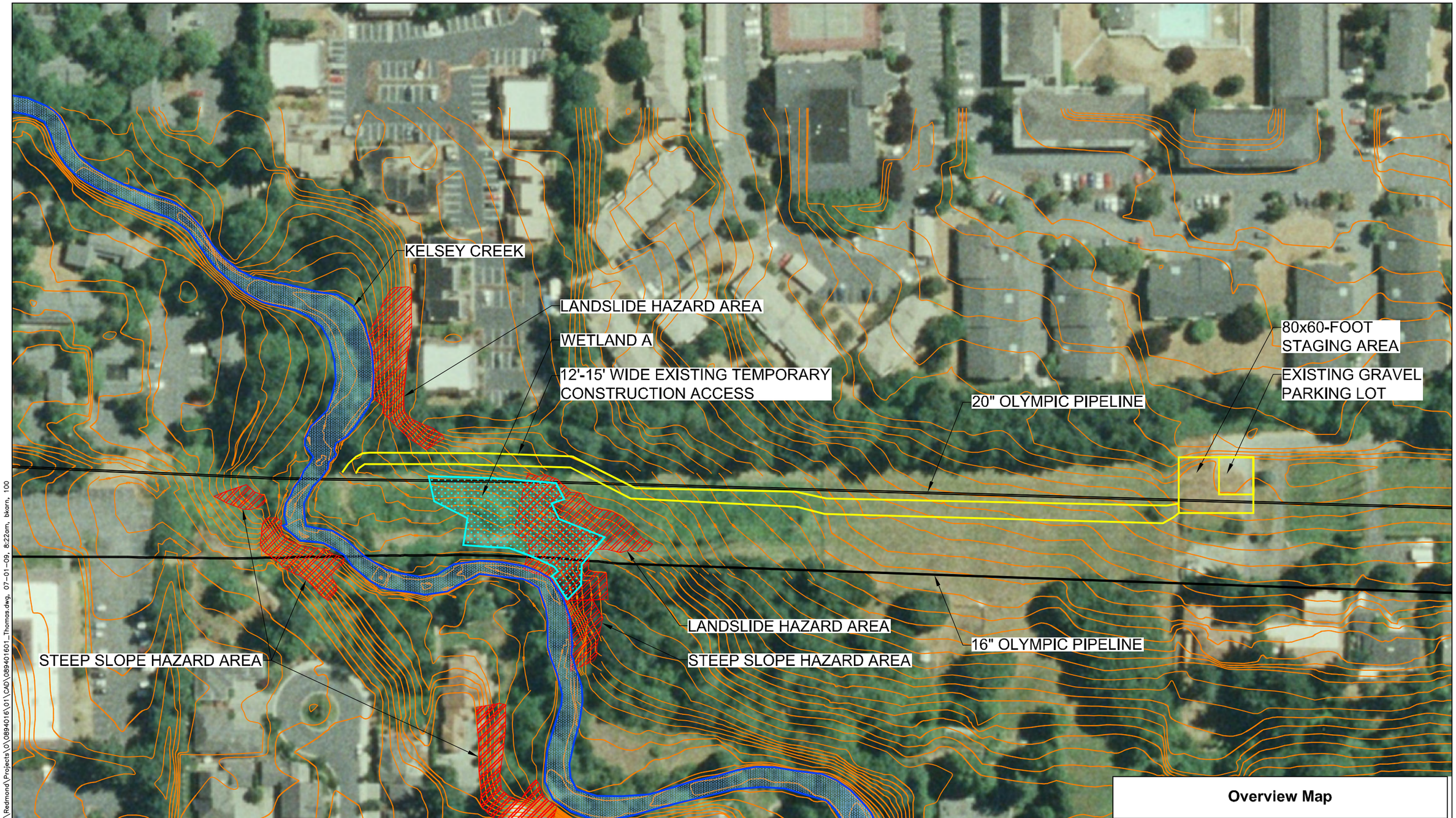
Figure 1

Office: RED Path: \\Red\projects\0\0894016\GIS\089401601 Fig1 VicinityMap.mxd KKS Map Revised: April 24, 2009



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N E S W

100 0 100
FEET

Overview Map

Olympic Pipe Line Company
Kelsey Creek Crossing and Fish Passage Mitigation
Bellevue, Washington

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Figure 2

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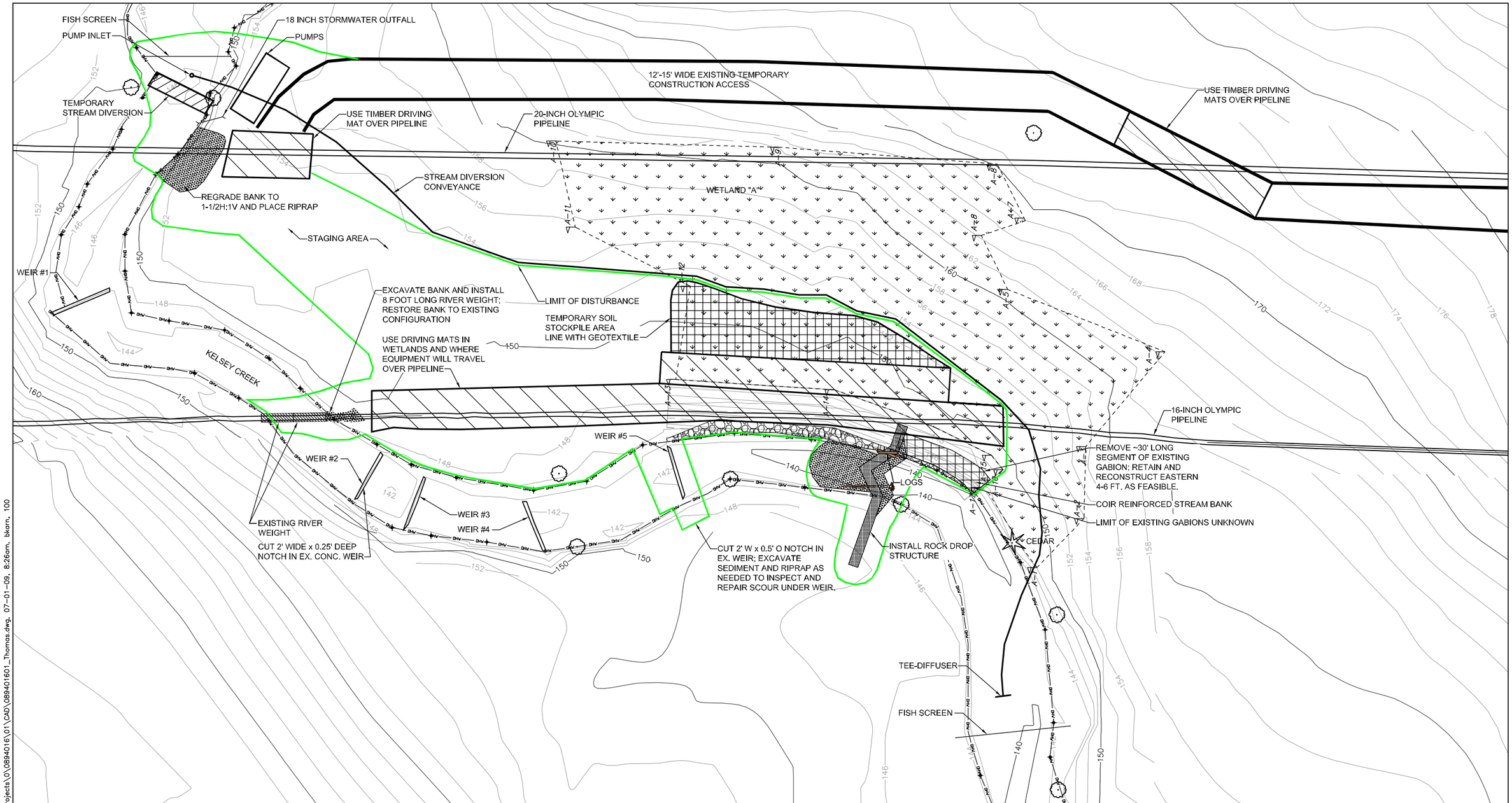

LEGEND

- ORDINARY HIGH WATER MARK
- LIMIT OF DISTURBANCE
- WETLAND A
- EXISTING TREE TO REMAIN
- EXISTING GABION BASKET WALL ALONG STREAM BANK
- PROPOSED RIP-RAP

30 0 30
FEET

Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. can not guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Reference: Drawing provided by Olympic Pipe Line Company.

Site Plan

Olympic Pipe Line Company
Kelsey Creek Crossing and Fish Passage Mitigation
Bellevue, Washington

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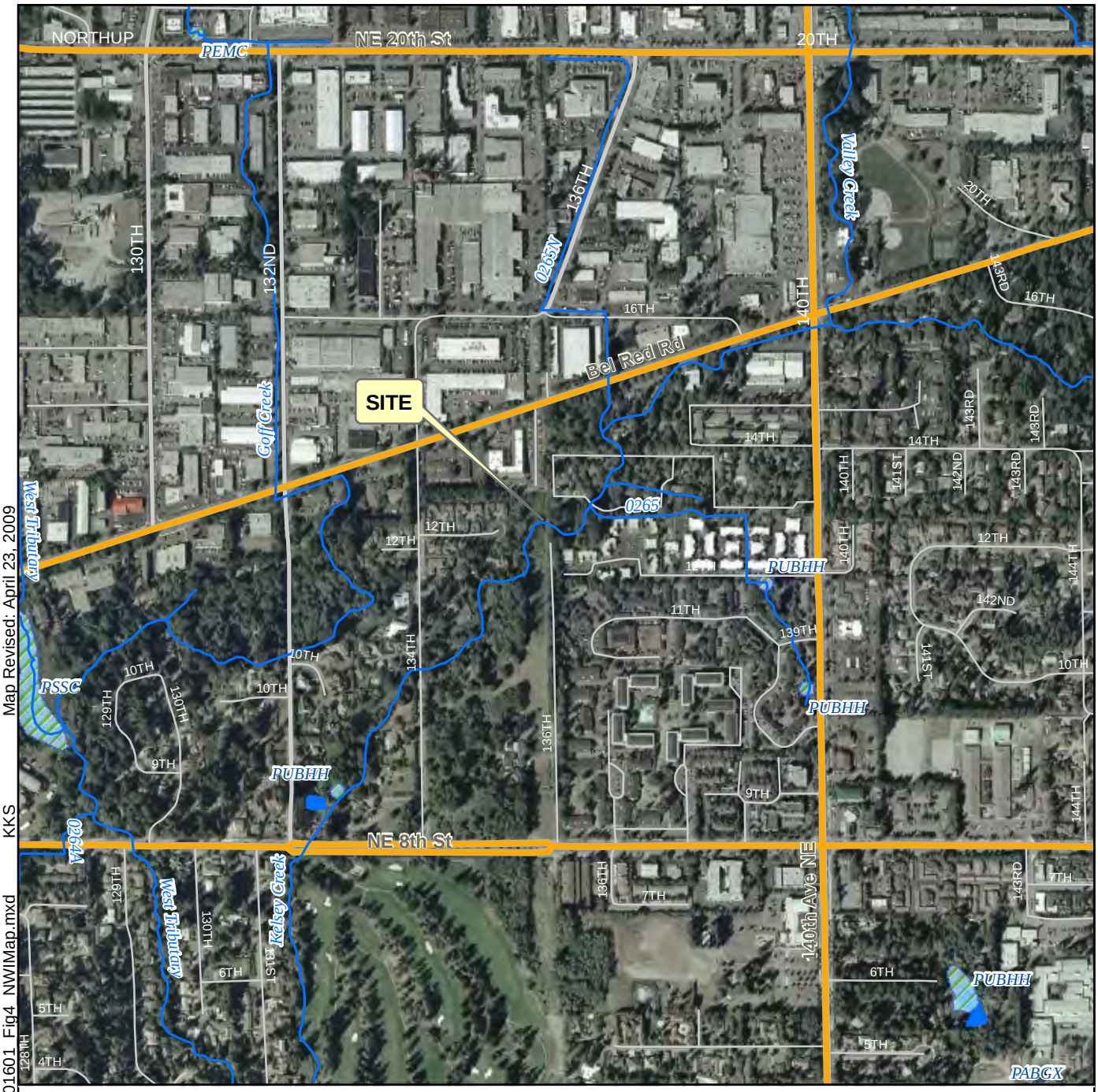
Figure 3

OFFICE:REDM PM CFE W:\Redmond\Projects\0\0894016\01\CAD\0894016 01_Thomas.dwg, 07-01-09, 8:26am, bkarn, 100



Explanation

- Streams
- National Wetland Inventory
- Water Bodies

N
W E
S

750 0 750
Feet

Notes:
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Data Sources: NWI (WDFW 2005), streams, waterbodies and minor streets (King County 2008), major streets and 2005 aerial imagery (ESRI 2009).

Transverse Mercator, Zone 10 N North, North American Datum 1983
North arrow oriented to grid north

National Wetland Inventory Map

Olympic Pipe Line Company
Kelsey Creek Pipeline Protection Project
Bellevue, Washington

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Figure 4

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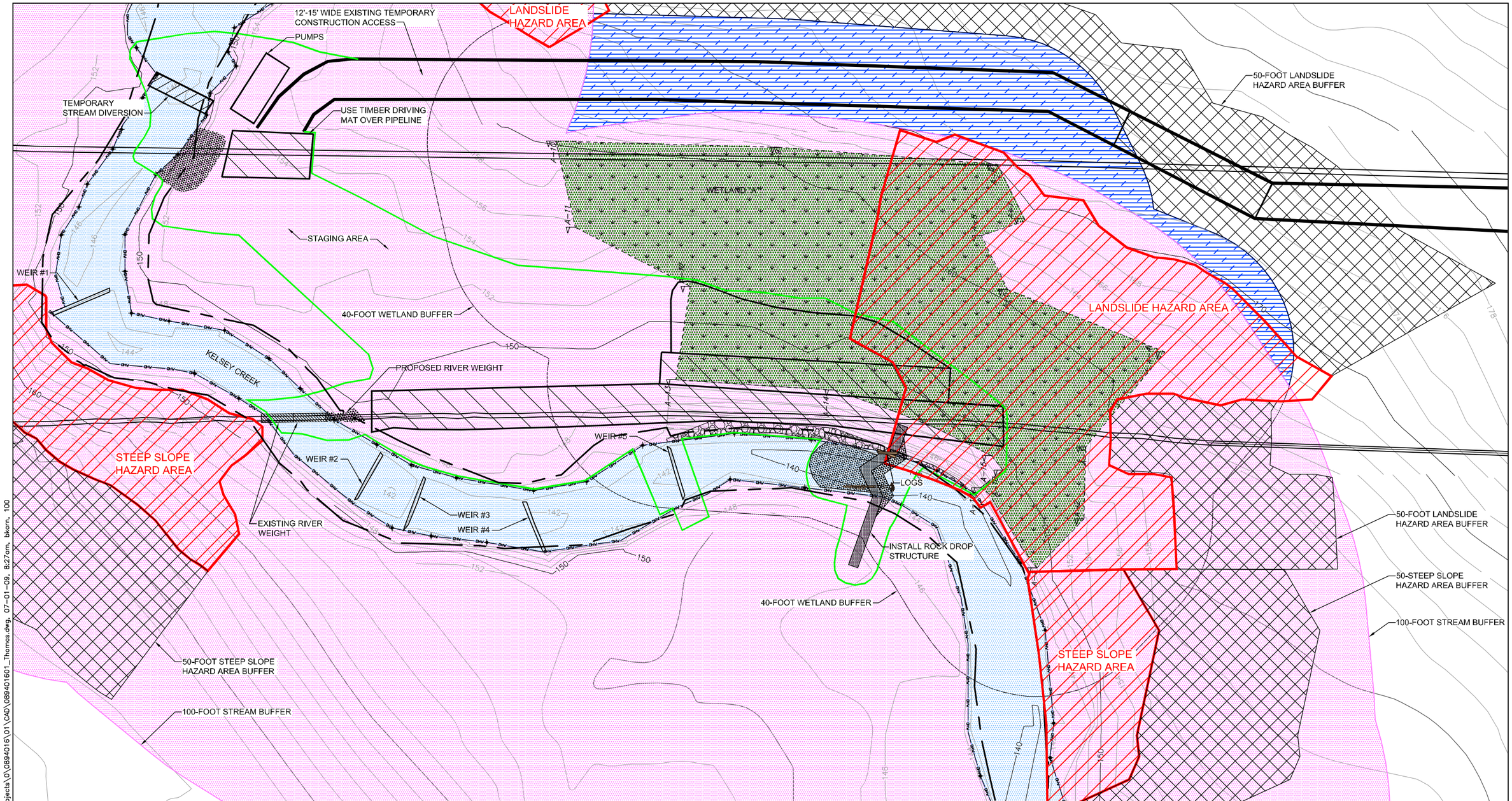

LEGEND

- ORDINARY HIGH WATER MARK
- 100-YEAR FLOOD PLAIN LIMITS
- LIMIT OF DISTURBANCE
- WETLAND A
- EXISTING GABION BASKET WALL ALONG STREAM BANK
- PROPOSED RIP-RAP
- 100-FOOT STREAM BUFFER
- 50-FOOT LANDSLIDE BUFFER
- LANDSLIDE HAZARD AREA AND STEEP SLOPE HAZARD AREAS
- WETLAND A BUFFER

30 0 30
FEET

Notes:
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Reference: Drawing provided by Olympic Pipe Line Company.

Critical Areas Map

Olympic Pipe Line Company
Kelsey Creek Crossing and Fish Passage Mitigation
Bellevue, Washington

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Figure 5

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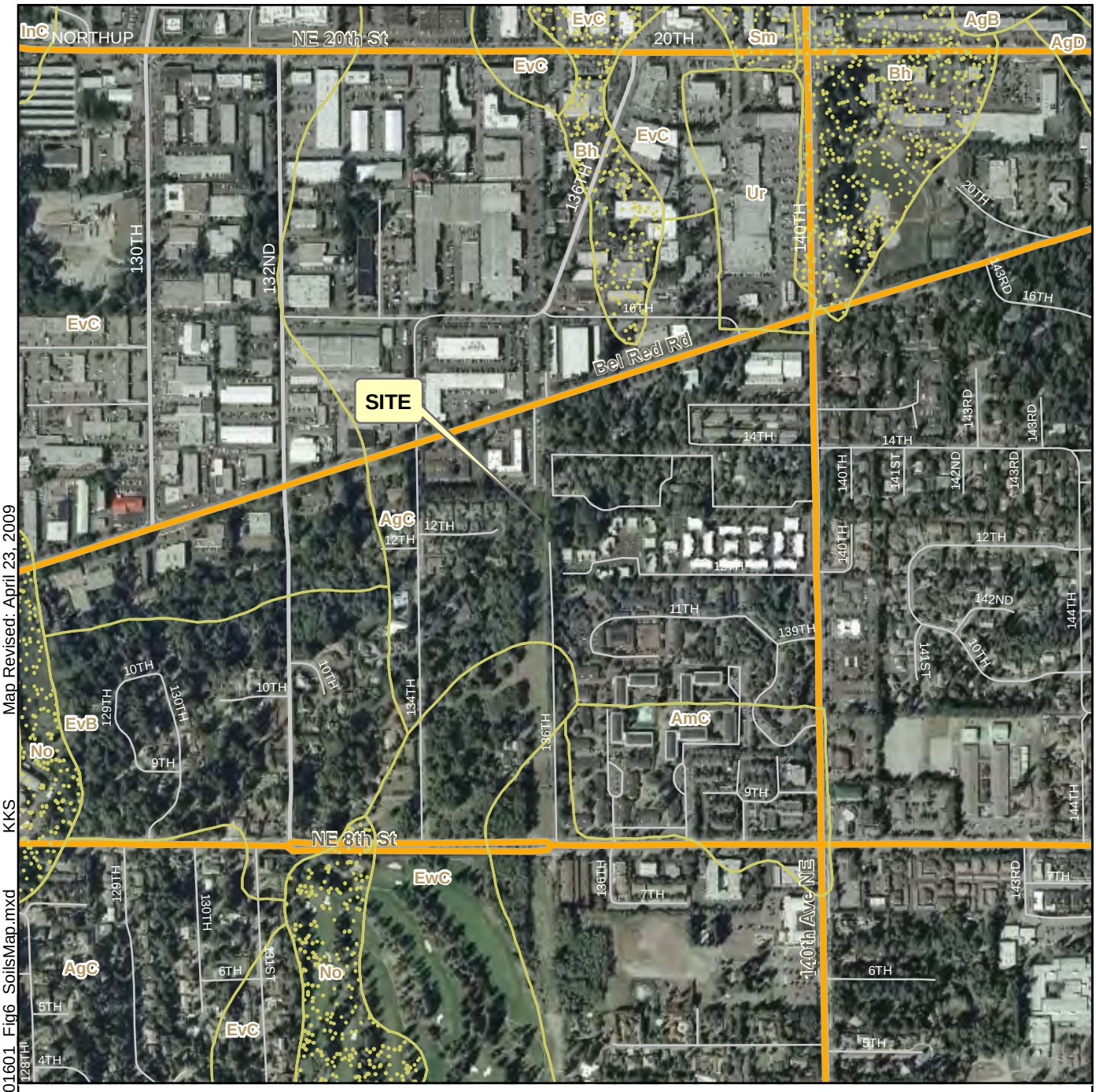

Soils Data

AgC - Alderwood gravelly sandy loam, 6 to 15% slopes
AmC - Arents, Alderwood material, 6 to 15% slopes
Bh - Bellingham silt loam
EvB - Everett gravelly sandy loam 0 to 5% slopes
EvC - Everett gravelly sandy loam 5 to 15% slopes
EwC - Everett-Alderwood gravelly sandy loams, 6 to 15% slopes
No - Normal sandy loam
Ur - Urban land

Explanation

Soils Data
Hydric Soils

N
W E
S

750 0 750
Feet

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Data Sources: soils data (NRCS 2003), minor streets (King County 2008), major streets and 2005 aerial imagery (ESRI 2009).
Transverse Mercator, Zone 10 N North, North American Datum 1983
North arrow oriented to grid north

Soils Map

Olympic Pipe Line Company
Kelsey Creek Pipeline Protection Project
Bellevue, Washington

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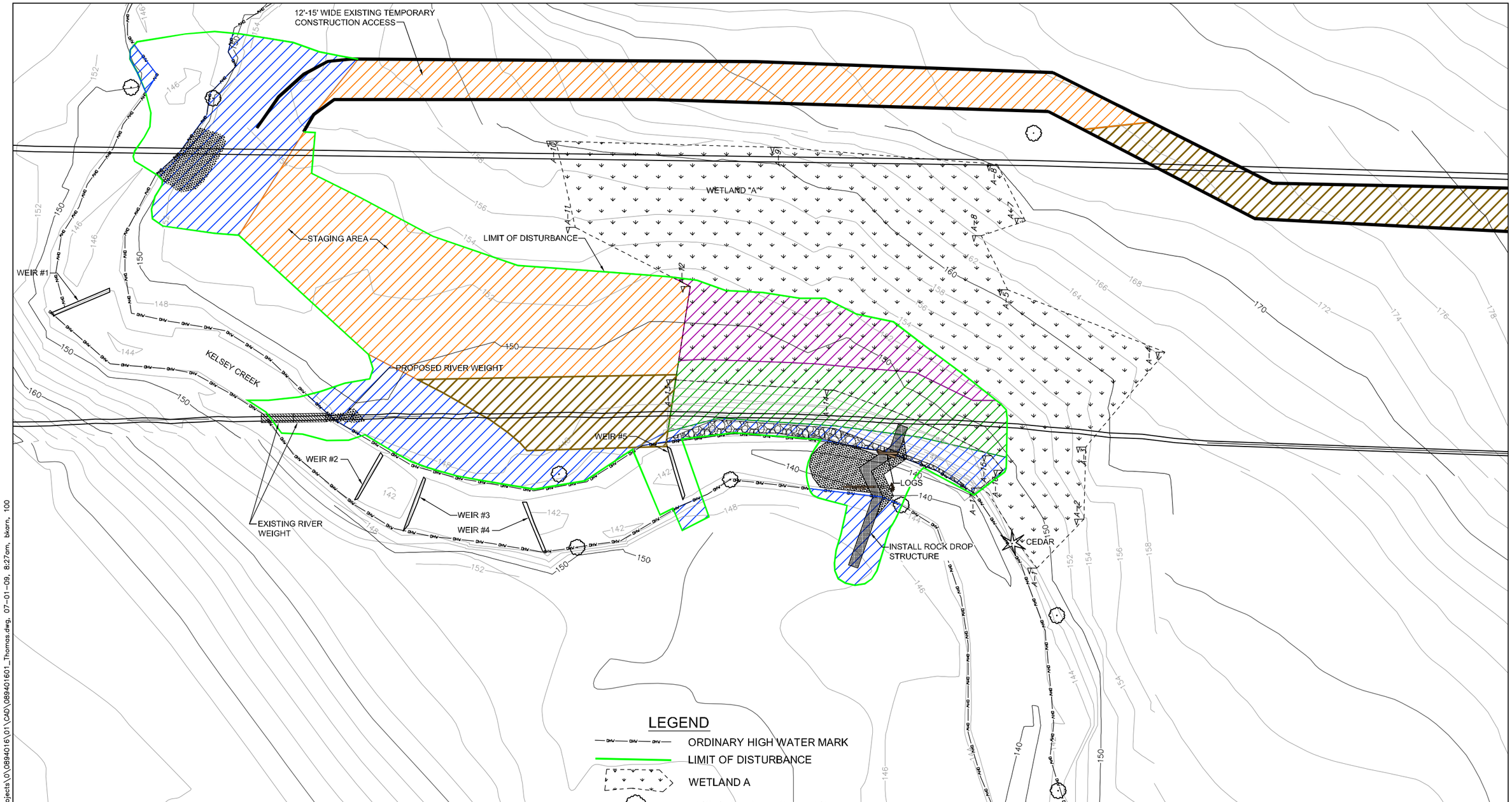
Figure 6

Office: RED Path: \\Red\projects\0\0894016\GIS\089401601 Fig6 SoilsMap.mxd KKS Map Revised: April 23, 2009



LEGEND

- ORDINARY HIGH WATER MARK
- LIMIT OF DISTURBANCE
- WETLAND A
- EXISTING TREE TO REMAIN
- GABION BASKET WALL
- PROPOSED RIP-RAP
- EMERGENT WETLAND (PEM)
- SHRUB WETLAND (PSS)
- RIPARIAN
- EMERGENT UPLAND
- SHRUB UPLAND

30 0 30
FEET

Notes:
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Reference: Drawing provided by Olympic Pipe Line Company.

Site Restoration Plan

Olympic Pipe Line Company
Kelsey Creek Crossing and Fish Passage Mitigation
Bellevue, Washington

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Figure 7

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Kelsey Creek Planting Schedule

Plant Species		Indicator Status
Common Name	**Scientific Name**	
Small-fuited bulrush	*Scirpus microcarpus*	OBL
Creeping spikerush	*Eleocharis palustris*	OBL
Soft rush	*Juncus effusus*	FACW+
Tufted hairgrass	*Deschampsia caespitosa*	FACW
Snowberry	*Symphoricarpos albus*	FACU
Oceanspray	*Holodiscus discolor*	UPL
Nootka rose	*Rosa nutkana*	FAC
Red-osier dogwood	*Cornus sericea*	FACW
Salmonberry	*Rubus spectabilis*	FAC+
Pacific ninebark	*Physocarpus capitatus*	FACW-
Hardhack	*Spirea douglasii*	FACW
Sitka willow	*Salix sitchensis*	FACW

Shrub Wetland Planting Schedule (1,571 sq. ft.)

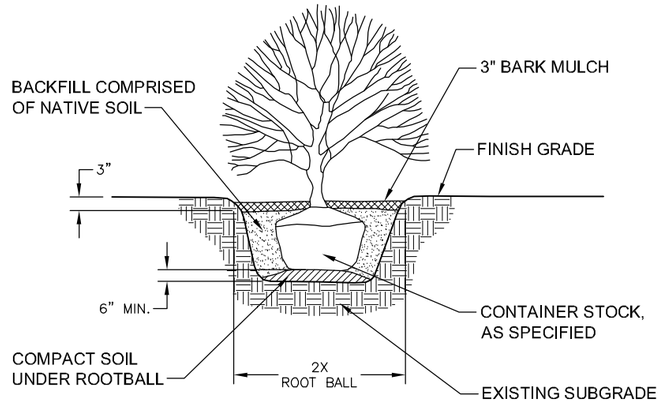
Plant Species		Indicator Status	On-Center Spacing	Size	Quantity
Common Name	**Scientific Name**				
Nootka rose	*Rosa nutkana*	FAC	6 Feet	5 GALLON	8
Red-osier dogwood	*Cornus sericea*	FACW	2 Feet	Live Stakes	65
Salmonberry	*Rubus spectabilis*	FAC+	6 Feet	5 GALLON	8
Pacific ninebark	*Physocarpus capitatus*	FACW-	6 Feet	5 GALLON	8
Hardhack	*Spirea douglasii*	FACW	6 Feet	5 GALLON	8
Sitka willow	*Salix sitchensis*	FACW	2 Feet	Live Stakes	65

Riparian Planting Schedule (4,799 sq. ft.)

Plant Species		Indicator Status	On-Center Spacing	Size	Quantity
Common Name	**Scientific Name**				
Nootka rose	*Rosa nutkana*	FAC	6 Feet	5 GALLON	23
Red-osier dogwood	*Cornus sericea*	FACW	2 Feet	Live Stakes	200
Salmonberry	*Rubus spectabilis*	FAC+	6 Feet	5 GALLON	23
Snowberry	*Symphoricarpos albus*	FACU	6 Feet	5 GALLON	23
Oceanspray	*Holodiscus discolor*	UPL	6 Feet	5 GALLON	23
Sitka willow	*Salix sitchensis*	FACW	2 Feet	Live Stakes	200

Shrub Upland Planting Schedule (8,075 sq. ft.)

Plant Species		Indicator Status	On-Center Spacing	Size	Quantity
Common Name	**Scientific Name**				
Nootka rose	*Rosa nutkana*	FAC	6 Feet	5 GALLON	57
Salmonberry	*Rubus spectabilis*	FAC+	6 Feet	5 GALLON	57
Snowberry	*Symphoricarpos albus*	FACU	6 Feet	5 GALLON	57
Oceanspray	*Holodiscus discolor*	UPL	6 Feet	5 GALLON	57



TYPICAL PLANTING DETAIL

NOT TO SCALE

Restoration Notes:

1. Disturbed areas of the site will be revegetated as shown on the Site Restoration Plan. Plant installation will be conducted on a vegetation community layout. Species will be grouped at the site based upon their specific hydrologic growing requirements. Vegetation communities are shown on the Site Restoration Plan.
2. Revegetation will be conducted immediately following construction during the relatively dry summer months to minimize sediment migration from the site and to rectify for actual construction impacts.
3. The contractor will leave the BMPs in place for the duration of the revegetation. The contractor will add additional BMPs to prevent sedimentation of the wetland, if necessary.
4. Once the pre-construction topography has been restored a layer of stockpiled native material, organic topsoil or compost will be incorporated into the finished grade to aid in the establishment of plant communities.
5. Revegetated areas at the completion of planting will be covered with composted mulch, arborist chips or similar.
6. Woody debris accumulated during the project will remain on site and contribute to habitat complexity and function at the site.
7. Plant material quantities shown on the plant schedules are estimates and actual quantities may vary.

SEED MIX SPECIFICATIONS

Emergent Upland Seed Blend: (15,005 SQ. FT.)	40% Rough bentgrass (*Agrostis scabra*)
	30% Red fescue (*Festuca Rubra*)
	30% Alaska brome (*Bromus sitchensis*)
Emergent Wetland Seed Blend: (1,918 SQ. FT.)	30% Small-fuited bulrush (*Scirpus microcarpus*)
	30% Soft rush (*Juncus effusus*)
	30% Tufted hairgrass (*Deschampsia caespitosa*)
	10% Creeping spikerush (*Eleocharis palustris*)
Seed Rate:	60 - 100 lbs per acre depending on the slope
Ground Prep:	Soil must be loose enough for the roots to establish
Mulching:	Apply 1-2 inches of composted mulch after broadcasting seed to protect seed from erosion and browsing by birds.

Notes:

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Restoration Details

Olympic Pipe Line Company
Kelsey Creek Crossing and Fish Passage Mitigation
Bellevue, Washington

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Figure 8

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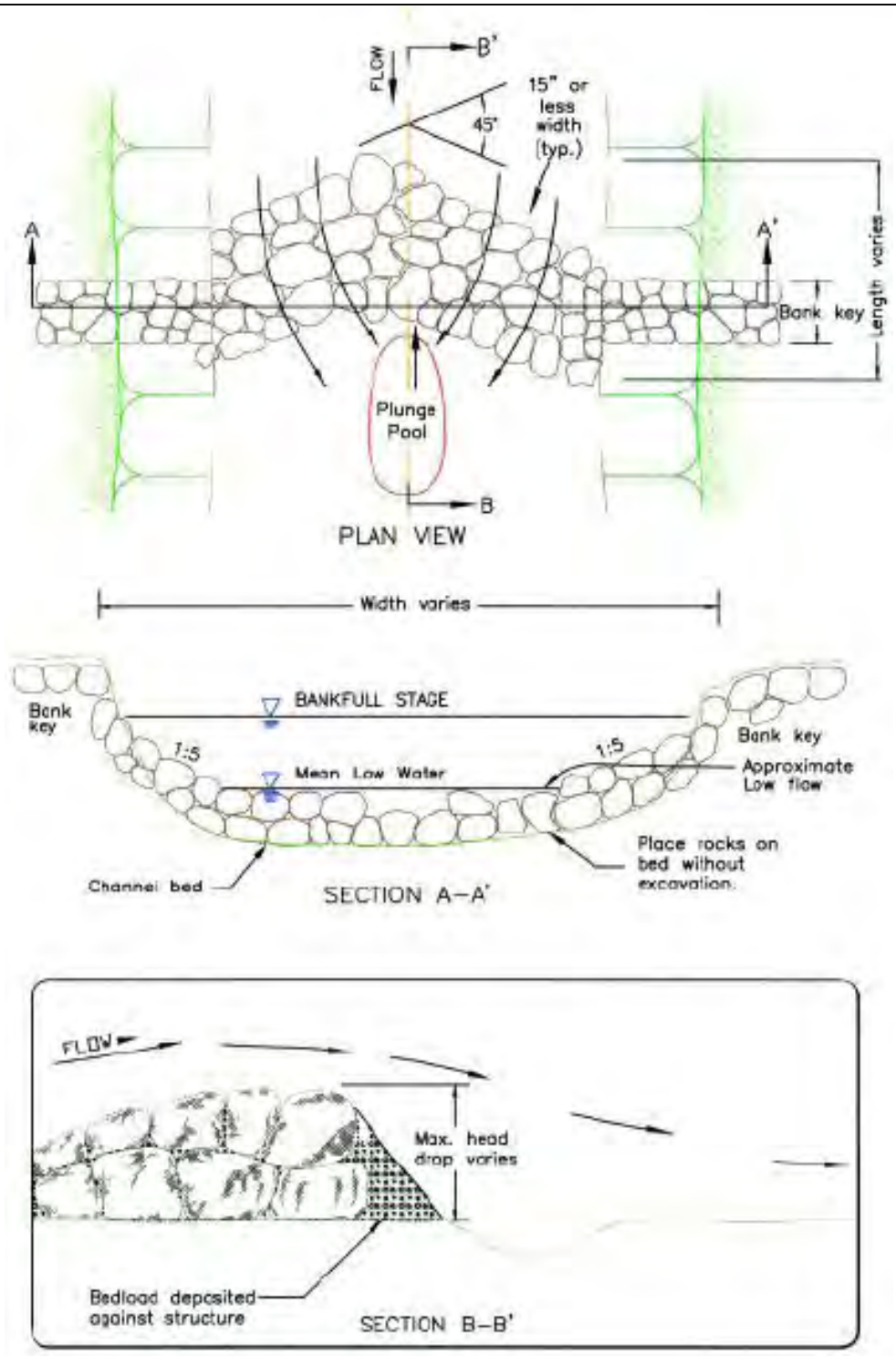

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Reference: Drawing provided by Washington State Department of Fish & Wildlife, 2003, "Washington State Aquatic Habitats Guidelines Program, integrated Streambank Protection Guidelines." 2003.

Conceptual Rock Drop Structure Design

Olympic Pipe Line Company
Kelsey Creek Crossing and Fish Passage Mitigation
Bellevue, Washington

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Figure 9

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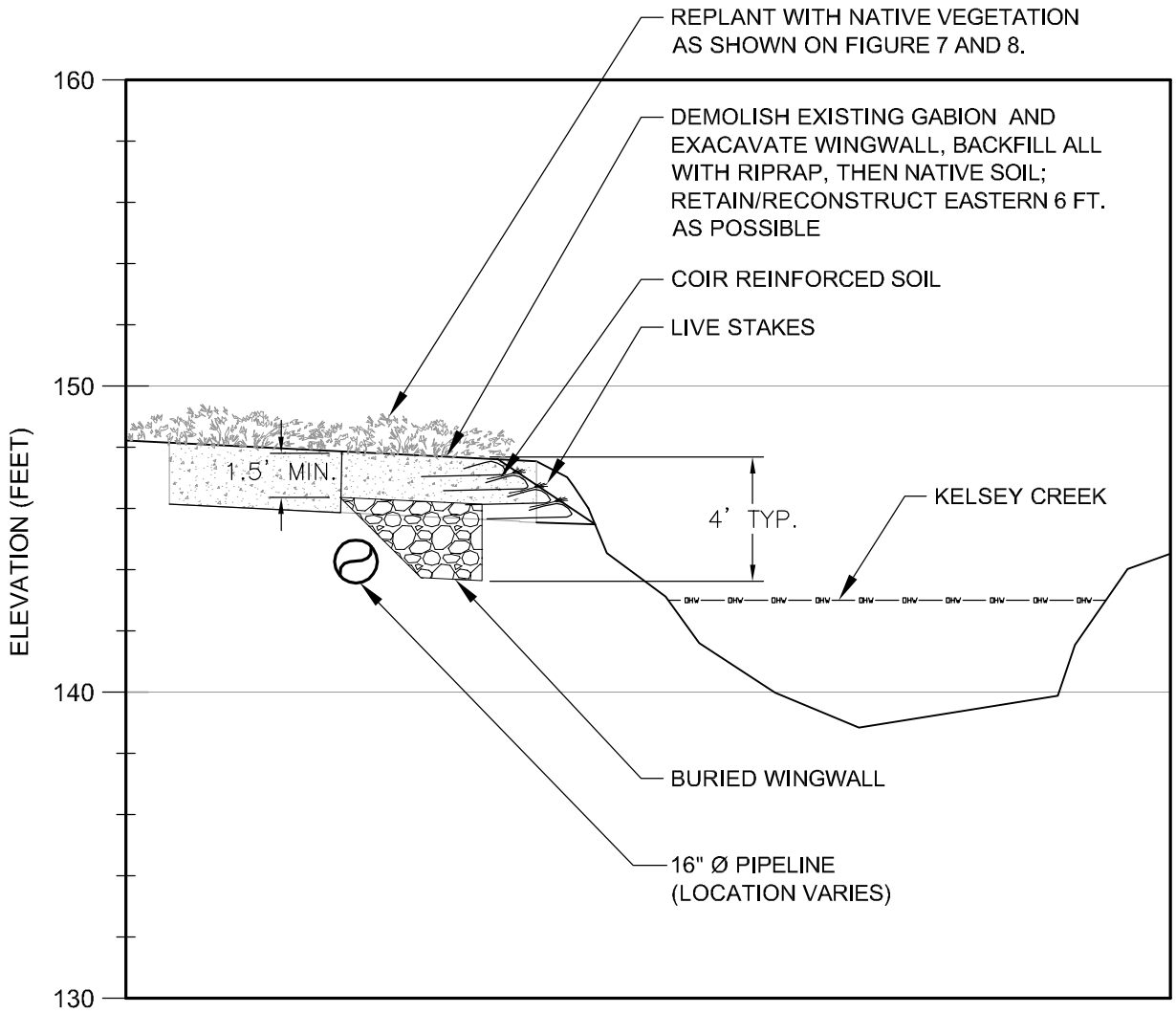

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Reference: Drawing provided by GeoEngineers.

Coir Reinforced Soil Lift Detail

Olympic Pipe Line Company
Kelsey Creek Crossing and Fish Passage Mitigation
Bellevue, Washington

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Figure 10

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Appendix A
Site Photos

Photo 1: Typical site conditions within the utility corridor. Note the yellow pin flags which identify the location of the 20-inch pipeline and the maintained grass along the alignment of the pipeline.

Photo 2: The maintained 16-inch pipeline corridor, facing north. The emergent community of Wetland A is in the foreground and the shrub community is at right. Kelsey Creek is at left.

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Site Photographs

Appendix A

REDM:\0\0894016\01\Working\Critical areas\Appendix B - Site Photos\0894016 01Appendix B Site Photos.ppt TAB:bmw 04/27/09

Photo 3: Photo illustrates the sloping conditions of Wetland A and the ident5ified landslide hazard in the utility corridor.

Photo 4: Typical stream conditions within the subject reach of Kelsey Creek. Weir #3 is in the foreground and Weir #2 is in the background.

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Appendix B
Wetland Datasheets

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

Project/Site: Kelsey Creek City/County: Bellevue Sampling Date: 10/14/2008

Applicant/Owner: Olympic Pipe Line Company State: Washington Sampling Point: SP-1

Investigator(s): Thomas Bannister Section/Township/Range: Section 27, T25N, R5E

Landform (hillslope, terrace, etc.): hillslope Local Relief (concave, convex, none:) concave Slope (%): 5

Subregion (LLR): Lat: Long: Datum:

Soil Map Unit Name: Alderwood gravelly sandy loam, 6 to 15 percent slopes NWI Classification:

Are climatic/hydrologic conditions on the site typical for this time of year? ☑ Yes ☐ No (if no, explain in Remarks.)

Are ☐ Vegetation ☐ Soil ☐ Hydrology significantly disturbed? Are "normal circumstances" present? ☑ Yes ☐ No

Are ☐ Vegetation ☐ Soil ☐ Hydrology naturally problematic? (if needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS

Hydrophytic Vegetation Present?	☑ Yes	☐ No	Is the sampled area within a Wetland? ☑ Yes ☐ No
Hydric Soil Present?	☑ Yes	☐ No	
Weltand Hydrology Present?	☑ Yes	☐ No	

Remarks:

VEGETATION - Use scientific Names of plants.

Tree Stratum (Plot Size: 2,826 square feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot Size: 78.5 square feet)			
1. *Salix sitchensis*	35	Yes	FACW
2. *Rubus spectabilis*	25	Yes	FAC+
3. *Cornus sericea*	15	Yes	FACW
4.			
5.			
	75	= Total Cover	
Herb Stratum (Plot Size: 78.5 square feet)			
1. *Phalaris arundinacea*	70	Yes	FACW
2. *Athyrium filix-femina*	10	No	FAC
3. *Symphytum officinale*	5	No	NI
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	85	= Total Cover	
Woody Vine Stratum (Plot Size: 2,826 square feet)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum

Dominance Test Worksheet:

Number of dominant Species That are OBL, FACW, or FAC: **4** (A)

Total Number of Dominant Species Across All Strata: **4** (B)

Percent of dominant Species That are OBL, FACW, or FAC: **100** (A/B)

Prevalence Index Worksheet:

Total % Cover of:			Multiply by:
OBL Species		x 1 =	0
FACW Species	120	x 2 =	240
FAC Species	35	x 3 =	105
FACU Species		x 4 =	0
UPL Species		x 5 =	0
Column Totals:	155	(A)	345 (B)

Prevalence Index = B/A = 2.23

Hydrophytic Vegetation Indicators:

☑ Dominance test is >50%

☑ Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (provide supporting data in Remarks or on a separate sheet.

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? ☑ Yes ☐ No

Remarks:

SOIL

Sampling Point: SP-1

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 to 16 inches	**10YR 3/1**	**98**	**See Remarks**	**2**			**Loam with sand**	

[1]Type: C=Concentration, D=Depletion, RM-Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histisol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):
Type: _____
Depth (inches): _____

Hydric Soil Present? ☑ Yes ☐ No

Remarks: Redox features were present; however; their small size and soil saturation made it difficult to obtain a color. Iron staining occurs at the surface.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☑ Surface Water (A1)
- ☐ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☑ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturated Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) **(LRR A)**
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	☑ Yes	☐ No	Depth (inches):	2
Water Table Present?	☐ Yes	☑ No	Depth (inches):	
Saturation Present? (includes capillary fringe)	☑ Yes	☐ No	Depth (inches):	at surface

Wetland Hydrology Present? ☑ Yes ☐ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

Project/Site: Kelsey Creek City/County: Bellevue Sampling Date: 10/14/2008

Applicant/Owner: Olympic Pipe Line Company State: Washington Sampling Point: SP-2

Investigator(s): Thomas Bannister Section/Township/Range: Section 27, T25N, R5E

Landform (hillslope, terrace, etc.): hillslope Local Relief (concave, convex, none:) Slope (%): 5

Subregion (LLR): Lat: Long: Datum:

Soil Map Unit Name: Alderwood gravelly sandy loam, 6 to 15 percent slopes NWI Classification:

Are climatic/hydrologic conditions on the site typical for this time of year? ☑ Yes ☐ No (if no, explain in Remarks.)

Are ☐ Vegetation ☐ Soil ☐ Hydrology significantly disturbed? Are "normal circumstances" present? ☑ Yes ☐ No

Are ☐ Vegetation ☐ Soil ☐ Hydrology naturally problematic? (if needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS

Hydrophytic Vegetation Present?	☑ Yes	☐ No	Is the sampled area within a Wetland? ☐ Yes ☑ No
Hydric Soil Present?	☐ Yes	☑ No	
Weltand Hydrology Present?	☐ Yes	☑ No	

Remarks:

VEGETATION - Use scientific Names of plants.

Tree Stratum (Plot Size: 2,826 square feet)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus balsamifera*	5	Yes	FAC
2.			
3.			
4.			
	5	= Total Cover	
Sapling/Shurb Stratum (Plot Size: 78.5 square feet)			
1. *Rubus spectabilis*	50	Yes	FAC+
2. *Rubus parviflorus*	50	Yes	FAC-
3. *Rubus armeniacus*	10	No	FACU
4.			
5.			
	110	= Total Cover	
Herb Stratum (Plot Size: 78.5 square feet)			
1. *Phalaris arundinacea*	60	Yes	FACW
2. *Polystichum munitum*	5	No	FACU
3. *Pteridium aquilinium*	5	No	FACU
4. *Guem macrophyllum*	5	No	FACW-
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	75	= Total Cover	
Woody Vine Stratum (Plot Size: 2,826 square feet)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum

Dominance Test Worksheet:

Number of dominant Species That are OBL, FACW, or FAC: **4** (A)

Total Number of Dominant Species Across All Strata: **4** (B)

Percent of dominant Species That are OBL, FACW, or FAC: **100** (A/B)

Prevalence Index Worksheet:

Total % Cover of:			Multiply by:
OBL Species		x 1 =	0
FACW Species	60	x 2 =	120
FAC Species	105	x 3 =	315
FACU Species	20	x 4 =	80
UPL Species		x 5 =	0
Column Totals:	185	(A)	515 (B)

Prevalence Index = B/A = 2.78

Hydrophytic Vegetation Indicators:

☑ Dominance test is >50%

☑ Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (provide supporting data in Remarks or on a separate sheet.

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? ☑ Yes ☐ No

Remarks:

SOIL

Sampling Point: SP-2

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 to 16 inches	**10YR 3/2**	**100**					**Loam**	

[1]Type: C=Concentration, D=Depletion, RM-Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histisol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? ☐ Yes ☑ No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturated Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) **(LRR A)**
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	☐ Yes	☑ No	Depth (inches): _____
Water Table Present?	☐ Yes	☑ No	Depth (inches): _____
Saturation Present? (includes capillary fringe)	☐ Yes	☑ No	Depth (inches): _____

Wetland Hydrology Present? ☐ Yes ☑ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

GeoEngineers

Appendix C
Wetland Rating Form

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 – Updated July 2006 to increase accuracy and reproducibility among users

Name of wetland (if known): **Kelsey Creek** Date of site visit: **10/14/08**

Rated by: **Thomas Bannister** Trained by Ecology? Yes ☒ No ☐ Date of training: **October 2008**

SEC: **27** TWNSHP: **25N** RNGE: **5E** Is S/T/R in Appendix D? Yes ☐ No ☒

Map of wetland unit: **Figure N/A** Estimated size: **0.25 acres**

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland: I ☐ II ☐ III ☒ IV ☐

Category I =	Score > 70	Score for Water Quality Functions	**6**
Category II =	Score 51 - 69	Score for Hydrologic Functions	**5**
Category III =	Score 30 – 50	Score for Habitat Functions	**17**
Category IV =	Score < 30	TOTAL Score for Functions	**28**

Category based on SPECIAL CHARACTERISTCS of Wetland I ☐ II ☐ Does not apply ☒

Final Category (choose the "highest" category from above") **IV**

Summary of basic information about the wetland unit.

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine	☐	**Depressional**	☐
Natural Heritage Wetland	☐	**Riverine**	☐
Bog	☐	**Lake-fringe**	☐
Mature Forest	☐	**Slope**	☒
Old Growth Forest	☐	**Flats**	☐
Coastal Lagoon	☐	**Freshwater Tidal**	☐
Interdunal	☐		
None of the above	☒	Check if unit has multiple HGM classes present	☐

Does the wetland being rated meet any of the criteria below? If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands that Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered **animal or plant** species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.	☐	☒
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered **animal** species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category 1 Natural Heritage Wetlands (see p. 19 of data form).	☐	☒
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*	☐	☒
SP4. *Does the wetland unit have a local significance in addition to its functions?* For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.	☐	☒

To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands in to those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Classification of Vegetated Wetlands for Western Washington

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
   NO – go to 2 **YES** – the wetland class is **Tidal Fringe**
   If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?
   YES – Freshwater Tidal Fringe **NO – Saltwater Tidal Fringe (Estuarine)**
   *If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is a Saltwater Tidal Fringe it is rated as an **Estuarine** wetland.* Wetlands that were call estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p. _____).

2. The entire wetland unit is flat and precipitation is only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
   NO – go to 3 **YES** – The wetland class is **Flats**
   If your wetland can be classified as a "Flats" wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland meet both of the following criteria?
   ☐ The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) where at least 20 acres (8ha) in size;
   ☐ At least 30% of the open water area is deeper than 6.6 (2 m)?
   NO – go to 4 **YES** – The wetland class is **Lake-fringe (Lacustrine Fringe)**

4. Does the entire wetland meet all of the following criteria?
   ☒ The wetland is on a slope *(slope can be very gradual)*.
   ☒ The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
   ☒ The water leaves the wetland **without being impounded**?
   NOTE: *Surface water does not pond in these types of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 foot deep).*
   NO – go to 5 **YES** – The wetland class is **Slope**

5. Does the entire wetland meet all of the following criteria?
   ☐ The unit is in a valley or stream channel where it gets inundated by overbank flooding from that stream or river.
   ☐ The overbank flooding occurs at least once every two years.
   NOTE: *The riverine unit can contain depressions that are filled with water when the river is not flooding..*
   NO – go to 6 **YES** – The wetland class is **Riverine**

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time of the year. This means that any outlet, if present is higher than the interior of the wetland.
   NO – go to 7 **YES** – The wetland class is **Depressional**

7. Is the entire wetland located in a very flat area with no obvious depression and no overbank flooding. The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.
   No – go to 8 YES – The wetland class is Depressional

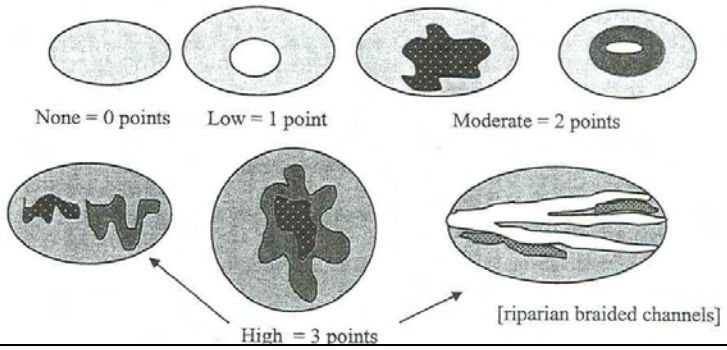
8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within your wetland. NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the class listed in column 2 is less than 10% of the unit, classify the wetland using the class that represents more than 90% of the total area.

HGM Classes within the wetland unit being rated	*HGM Class to Use in Rating*
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake-fringe	Lake-fringe
Depressional + Riverine along stream within boundary	Depressional
Depressional + Lake-fringe	Depressional
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE under wetlands with special characteristics

If you are unable still to determine which of the above criteria apply to your wetland, or you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

S	Slope Wetlands	Points
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	(only 1 score per box)
S 1	**Does the wetland have the <u>potential</u> to improve water quality?**	*(see p.64)*
	S 1.1 Characteristics of average slope of unit: • Slope is 1% or less *(a 1% slope has a 1 ft. vertical drop in elevation for every 100 ft. horizontal distance)*..... points = 3 • Slope is 1% - 2% ..... points = 2 • Slope is 2% - 5%. ..... points = 1 • Slope is greater than 5% ..... points = 0	**1**
	S 1.2 The soil 2 inches below the surface (or duff layer) is clay, organic *(Use NRCS definitions).* **YES** = 3 points **NO** = 0 points	**0**
	S 1.3 Characteristics of the vegetation in the wetland that trap sediments and pollutants: *Choose the points appropriate for the description that best fits the vegetation in the wetland. Dense vegetation means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 inches.* • Dense, uncut, herbaceous vegetation > 90% of the wetland area..... points = 6 • Dense, uncut, herbaceous vegetation > 1/2 of area ..... points = 3 • Dense, woody, vegetation > 1/2 of area..... points = 2 • Dense, uncut, herbaceous vegetation > 1/4 of area ..... points = 1 • Does not meet any of the criteria above for vegetation ..... points = 0 **Aerial photo or map with vegetation polygons**	**Figure ___** **2**
	Total for S 1 *Add the points in the boxes above*	**3**
S 2	**Does the wetland have the <u>opportunity</u> to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland? *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ☐ Grazing in the wetland or within 150 ft ☐ Untreated stormwater discharges to wetland ☐ Tilled fields, logging, or orchards within 150 ft. of wetland ☒ Residential, urban areas, or golf courses are within 150 ft. upslope of wetland ☐ Other _____ **YES** multiplier is 2 **NO** multiplier is 1	*(see p. 67)* Multiplier **2**
◆	**<u>TOTAL</u> – Water Quality Functions** Multiply the score from S1 by S2; then ***add score to table on p. 1***	**6**
	HYDROLOGIC FUNCTIONS – Indicators that wetland functions to reduce flooding and stream erosion.	
S 3	**Does the wetland have the <u>potential</u> to reduce flooding and stream erosion?**	*(see p.68)*
	S 3.1 Characteristics of vegetation that reduce the velocity of surface flows during storms: *Choose the points appropriate for the description that best fits conditions in the wetland (stems of plants should be thick enough (usually > 1/8in), or dense enough to remain erect during surface flows).* • Dense, uncut, **rigid** vegetation covers > 90% of the area of the wetland ..... points = 6 • Dense, uncut, **rigid** vegetation> 1/2 area of wetland ..... points = 3 • Dense, uncut, **rigid** vegetation > 1/4 area..... points = 1 • More than 1/4 of area is grazed, mowed, tilled, or vegetation is not rigid ..... points = 0	**3**
	S 3.2 Characteristics of slope wetland that holds back small amounts of flood flows. The slope has small surface depressions that can retain water over at least 10% of its area. **YES** = 2 points **NO** = 0 points	**2**
	Add the points in the boxes above	**5**
S 4	**Does the wetland have the <u>opportunity</u> to reduce flooding and erosion?** Is the wetland in a landscape position where the reduction in water velocity it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows? *Note which of the following conditions apply.* ☐ Wetland has surface runoff that drains to a river or stream that has flooding problems ☐ Other _____ *(Answer NO if the major source of water is controlled by a reservoir (e.g. wetland is a seep that is on the downstream side of a dam)* **YES** multiplier is 2 **NO** multiplier is 1	*(see p. 70)* Multiplier **1**
◆	**<u>TOTAL</u> – Hydrologic Functions** Multiply the score from S3 by S4; then ***add score to table on p. 1***	**5**

Comments:

These questions apply to wetlands of all HGM classes.		**Points** (only 1 score per box)
	HABITAT FUNCTIONS – Indicators that wetland functions to provide important habitat.	
H 1	**Does the wetland have the <u>potential</u> to provide habitat for many species?**	
	H 1.1 <u>Vegetation structure</u> *(see P. 72)*: *Check the types of vegetation classes present (as defined by Cowardin) – Size threshold for each class is 1/4 acre or more than 10% of the area if unit is smaller than 2.5 acres.* ☐ Aquatic Bed ☒ Emergent plants ☒ Scrub/shrub (areas where shrubs have > 30% cover) ☐ Forested (areas where trees have > 30% cover) *If the unit has a forested class check if:* ☐ The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon. *Add the number of vegetation types that qualify. If you have:* **Map of Cowardin vegetation classes** 4 structures or more ..... points = 4 — 3 structures ..... points = 2 2 structures ..... points = 1 — 1 structure ..... points = 0	**Figure ___** **1**
	H 1.2 <u>Hydroperiods</u> *(see p.73)*: *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or 1/4 acre to count (see text for descriptions of hydroperiods).* ☐ Permanently flooded or inundated — 4 or more types present points = 3 ☐ Seasonally flooded or inundated — 3 or more types present ..... points = 2 ☐ Occasionally flooded or inundated — 2 types present ..... points = 1 ☒ Saturated only — 1 type present ..... points = 0 ☒ Permanently flowing stream or river in, or adjacent to, the wetland ☐ Seasonally flowing stream in, or adjacent to, the wetland ☐ **Lake-fringe wetland ..... = 2 points** ☐ **Freshwater tidal wetland ..... = 2 points** **Map of hydroperiods**	**Figure ___** **1**
	H 1.3 <u>Richness of Plant Species</u> *(see p. 75)*: Count the number of plant species in the wetland that cover at least 10 ft^2 *(different patches of the same species can be combined to meet the size threshold)* *You do not have to name the species. Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle.* If you counted: > 19 species ..... points = 2 5 – 19 species ..... points = 1 List species below if you want to: < 5 species ..... points = 0 _____ _____ _____ _____	**2**
	H 1.4 Interspersion of Habitats *(see p. 76)*: Decided from the diagrams below whether interspersion between Cowardin vegetation (described in H1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  Note: If you have 4 or more classes or 3 vegetation classes and open water, the rating is always "high". **Use map of Cowardin classes.**	**Figure ___** **2**
	H 1.5 <u>Special Habitat Features</u> *(see p. 77)*: *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ☐ Large, downed, woody debris within the wetland (> 4 in. diameter and 6 ft. long) ☐ Standing snags (diameter at the bottom > 4 inches) in the wetland ☐ Undercut banks are present for at least 6.6 ft. (2m) and/or overhanging vegetation extends at least 3.3 ft. (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft. (10m) ☐ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* ☐ At least 1/4 acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated *(structures for egg-laying by amphibians)* ☒ Invasive plants cover less than 25% of the wetland area in each stratum of plants *NOTE: The 20% stated in early printings of the manual on page 78 is an error.*	**1**
	H 1 TOTAL Score – potential for providing habitat *Add the points in the column above*	**7**

H 2	**Does the wetland have the <u>opportunity</u> to provide habitat for many species?**	(only 1 score per box)
	H 2.1 <u>Buffers</u> *(see P. 80)*: *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed".* ☐ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 95% of circumference. No structures are within the undisturbed part of buffer (relatively undisturbed also means no grazing, no landscaping, no daily human use)..... **points = 5** ☐ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference ..... **points = 4** ☐ 50m (170 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 95% circumference ..... **points = 4** ☐ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference ..... **points = 3** ☒ 50m (170 ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference ..... **points = 3** **If buffer does not meet any of the criteria above:** ☐ No paved areas (except paved trails) or buildings within 25m (80 ft) of wetland > 95% circumference. Light to moderate grazing or lawns are OK ..... **points = 2** ☐ No paved areas of buildings within 50m of wetland for > 50% circumference. Light to moderate grazing or lawns are OK ..... **points = 2** ☐ Heavy grazing in buffer ..... **points = 1** ☐ Vegetated buffers are < 2m wide (6.6 ft) for more than 95% circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland)..... **points = 0** ☐ Buffer does not meet any of the criteria above ..... **points = 1** **Arial photo showing buffers**	**Figure ___** **3**
	H 2.2 <u>Corridors and Connections</u> *(see p. 81)* H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft. wide, has at least a 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? *(Dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor).* **YES** = **4 points** (go to H 2.3) **NO** = go to H 2.2.2 H. 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50 ft. wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR a Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? **YES** = **2 points** (go to H 2.3) **NO** = go to H 2.2.3 H. 2.2.3 Is the wetland: • Within 5 mi (8km) of a brackish or salt water estuary OR • Within 3 miles of a large field or pasture (> 40 acres) OR **YES** = 1 point • Within 1 mile of a lake greater than 20 acres? **NO** = 0 points	**0**

Total for page: **3**

Comments:

	H 2.3 Near or adjacent to other priority habitats listed by WDFW ***(see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report http://wdfw.wa.gov/hab/phslist.htm***) Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* ☐**Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre). ☒**Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report p. 152*). ☐**Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock. ☐**Old-growth/Mature forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age. **(**Mature forests) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest. ☐ **Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158*). ☒**Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other. ☐**Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161*). ☒**Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources. ☐ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report: pp. 167-169 and glossary in Appendix A).* ☐**Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human. ☐**Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft. ☐**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ☐**Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long. If wetland has **3 or more** priority habitats **= 4 points** If wetland has **2** priority habitats = **3 points** If wetland has **1** priority habitat **= 1 point** No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	**4**
	H 2.4 <u>Wetland Landscape</u>: *Choose the **one** description of the landscape around the wetland that best fits (see p. 84)* • There are at least 3 other wetlands within 1/2 mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development.....points = 5 • The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within 1/2 mile .....points = 5 • There are at least 3 other wetlands within 1/2 mile, BUT the connections between them are disturbed. .....points = 3 • The wetland fringe on a lake **with** disturbance and there are 3 other lake-fringe wetlands within 1/2 mile .....points = 3 • There is at least 1 wetland within 1/2 mile .....points = 2 • There are no wetlands within 1/2 mile.....points = 0	**3**
	H 2 TOTAL Score – opportunity for providing habitat *Add the scores from H2.1, H2.2, H2.3, H2.4*	**10**
	TOTAL for H 1 from page 8	**7**
◆	**Total Score for Habitat Functions** Add the points for H 1 and H 2; then ***record the result on p. 1***	**17**

Comments:

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate answers and Category.

	Wetland Type – *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	
SC1	**Estuarine wetlands?** *(see p.86)* Does the wetland unit meet the following criteria for Estuarine wetlands? ☐ The dominant water regime is tidal, ☐ Vegetated, and ☐ With a salinity greater than 0.5 ppt. **YES** = Go to SC 1.1 **NO** ☒	
	SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? **YES** = Category I **NO** = go to SC 1.2	**Cat. 1**
	SC 1.2 Is the wetland at least 1 acre in size and meets at least two of the following conditions? **YES** = Category I **NO** = Category II ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native *Spartina* spp,. are only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category 1. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. ☐ At least 3/4 of the landward edge of the wetland has a 100 ft. buffer of shrub, forest, or un-grazed or un-mowed grassland ☐ The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** **Cat. II** **Dual Rating I/II**
SC2	**Natural Heritage Wetlands** *(see p. 87)* Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland being rated in a Section/Township/Range that contains a natural heritage wetland? *(This question is used to screen out most sites before you need to contact WNHP/DNR.)* S/T/R information from Appendix D ☒ or accessed from WNHP/DNR web site ☒ **YES** ☐ Contact WNHP/DNR (see p. 79) and go to SC 2.2 **NO** ☒ SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as a site with state threatened or endangered plant species? **YES** = Category 1 **NO** ☐ not a Heritage Wetland	**Cat I**
SC3	**Bogs** *(see p. 87)* Does the wetland **(or any part of the unit)** meet both the criteria for soils and vegetation in bogs? Use the key below to identify if the wetland is a bog. ***If you answer yes you will still need to rate the wetland based on its function.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of soil profile? (See Appendix B for a field key to identify organic soils)? **YES** = go to question 3 **NO** = go to question 2 2. Does the wetland have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? **YES** = go to question 3 **NO** = is not a bog for purpose of rating 3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)? **YES** = Is a bog for purpose of rating **NO** = go to question 4 NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog. 4. Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine. WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover*)? **YES** = Category I **NO** ☒ Is not a bog for purpose of rating	**Cat. I**

SC4	**Forested Wetlands** *(see p. 90)* Does the wetland have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *If you answer yes you will still need to rate the wetland based on its function.* ☐ **Old-growth forests**: (west of Cascade Crest) Stands of at least two three species forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm or more). NOTE: The criterion for dbh is based on measurements for upland forests. Two-hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The DFW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter. ☐ **Mature forests**: (west of the Cascade Crest) Stands where the largest trees are 80 – 200 years old OR have an average diameters (dbh) exceeding 21 inches (53 cm); crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth. **YES** = Category I **NO** = ☒ not a forested wetland with special characteristics	**Cat. I**
SC5	**Wetlands in Coastal Lagoons** *(see p. 91)* Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? ☐ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks. ☐ The lagoon in which the wetland is located contains surface water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom.)* **YES** = Go to SC 5.1 **NO** ☒ not a wetland in a coastal lagoon SC 5.1 Does the wetland meet all of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing) and has less than 20% cover of invasive plant species (see list of invasive species on p. 74). ☐ At least 3/4 of the landward edge of the wetland has a 100 ft. buffer of shrub, forest, or un-grazed or un-mowed grassland. ☐ The wetland is larger than 1/10 acre (4350 square ft.) **YES** = Category I **NO** = Category II	**Cat. I** **Cat. II**
SC6	**Interdunal Wetlands** *(see p. 93)* Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? **YES** = Go to SC 6.1 **NO** ☒ not an interdunal wetland for rating ***If you answer yes you will still need to rate the wetland based on its functions.*** In practical terms that means the following geographic areas: • Long Beach Peninsula -- lands west of SR 103 • Grayland-Westport -- lands west of SR 105 • Ocean Shores-Copalis – lands west of SR 115 and SR 109 SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is one acre or larger? **YES** = Category II **NO** = go to SC 6.2 SC 6.2 Is the wetland between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? **YES** = Category III	**Cat. II** **Cat. III**
◆	**Category of wetland based on Special Characteristics** *Choose the "highest" rating if wetland falls into several categories, and record on p. 1.* If you answered **NO** for all types enter "Not Applicable" on p. 1	

Comments:

GeoEngineers

Appendix D

Special Conditions for Instream Habitat Design Engineering Services

APPENDIX D
SPECIAL CONDITIONS FOR INSTREAM HABITAT DESIGN ENGINEERING SERVICES

Instream Habitat Enhancement, Stabilization and/or Restoration Structures (Structures) may involve the placement of large logs, logs with root wads, large rocks and other natural or artificial materials and/or features in and adjacent to creeks, streams and rivers (streams). These Structures are designed for various purposes including but not limited to: improvement of aquatic and riparian habitat; stabilization of eroding stream banks and channels; creation or improvement of recreational uses; irrigation; and flood management. These Structures create potential hazards, including, but not limited to: humans falling from the Structures and associated injury or death; collisions of recreational users' and their watercraft with the Structures and associated risk of injury or death, with partial or total damage of the watercraft; mobilization of a portion or all of the Structures during high water flow conditions and any subsequent related damage to downstream properties, utilities, roads, bridges and other infrastructure, and injury or death to humans; flooding; erosion; and channel avulsion. To reduce the risk of injury or death caused by these hazards, we recommend that the client post and maintain conspicuous warning signs on, upstream and downstream from the Structures for as long as the Structures remain in the stream, identifying the Structure locations, and the specific hazards the Structures present to recreational users. We further recommend that the client distribute pamphlets to nearby residents warning of the danger to children and adults posed by the Structures. Client shall indemnify GeoEngineers against any damages arising from Client's failure to follow these recommendations, to the extent provided in the INDEMNIFICATION section of the GENERAL CONDITIONS.